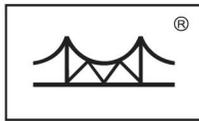




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Golden Bridge Welding Materials

■ Product sample ■

**TIANJIN GOLDEN BRIDGE WELDING
MATERIALS GOURP CO.,LTD**

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Preface

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Tianjin Golden Bridge Welding Materials Group Co., Ltd. is a large enterprise engaged in professional research and production of welding materials. The "Golden Bridge Welding Materials" brand is well-known both at home and abroad, its technology can be traced back to welding materials of the "Lianhuan" brand in the early 1950s, which are deeply loved by a large number of welders. The Group currently has 2 branches, 3 joint ventures, 15 subsidiaries and 12 production bases. Mr. Hou Lizun, the founder of the Group, has been engaged in welding material manufacturing industry for more than 70 years. He owns multiple proprietary technologies in the fields of raw materials, paint slag series, production equipment, production technology, etc., which has laid a solid foundation for development of welding technologies in China. Mr. Hou Lizun was awarded the highest honor in Chinese welding industry – "China Welding Lifetime Achievement Award". Up to now, Mr. Hou Lizun is the only one person who has won this great honor in Chinese welding material manufacturing industry.

Our Group is capable of producing more than 400 varieties of welding materials such as various welding rods, gas-shielded solid welding wires, gas-shielded and self-shielded flux-cored welding wires, submerged arc welding wires, flux, welding strips and aluminum welding wires. Products are complete in varieties and specifications and the annual production and sale volume of welding materials of the Group reaches more than 1.4 million tons. It is the first welding material enterprise in the world whose production and sale volume exceeds one million tons, and it ranks first in the industry for 19 consecutive years. Products are widely applied to the manufacturing of ships, bridges, boiler and pressure containers and rolling stock, and petroleum, chemical engineering, metallurgy, architecture and other fields. In addition, the Group is able to undertake the research, development and production tasks of welding materials with special requirements of users, actively research and develop new welding materials so as to satisfy national demands for high-end equipment manufacturing and technological development and develop non-ferrous and white environmental-protection welding materials to meet the needs of national key projects. It serves national economic development and national defense construction. Its sales network covers the whole country and its products are exported to more than 100 countries and regions in the world.

The company has a technology research and development team full of innovative spirit, constantly exploring and pushing forward the forefront of technology. It owns a complete and strict quality management system, as well as objective and scientific inspection and testing mechanism, accompanied with complete testing equipment, which has reached the world advanced level.



Product Sort

Major products have been certified by a series of classification societies, such as CCS, LR, BV, ABS, DNVGL, NK, KR, RS, RINA and BKI and obtained TÜV, DB and CE certification. The quality system has not only passed ISO9001 quality certification, but also passed quality certification in fields of nuclear power, boilers and ships.

Golden Bridge Welding Materials Group is dedicated to revitalizing national industry evolution, conforming to national economic construction and development need, actively accelerating its transformation and upgrading pace, strengthening management system and mechanism innovation and building the fine and information-based scientific management model; adjusting the product structure, increasing investment in science and technology, realizing achievement transformation and increasing the brand value; formulating the intelligent production plan and promote full-automatic production equipment coverage; adhering to the sustainable development road of green, environmental protection and cleaner production; adhering to the human capital cultivation engineering to ensure the long-term development of the company.

The mission of the Group is: Revitalize national industry evolution, repay country with optimal welding materials.

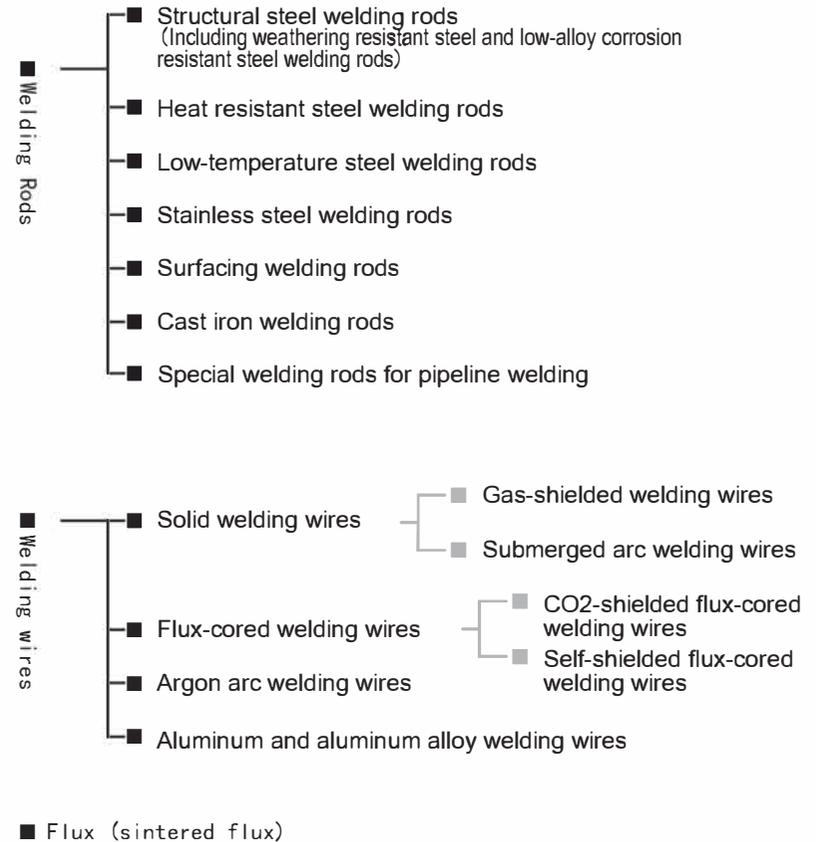
The vision of the Group is: Innovation leads industry development, create new era of welding consumables.

The core value of the Group is: Endless in pursuing high quality products, flawless in serving for our customers.



Product Sort

Classification of “Golden Bridge Welding Materials”





Featured products of the company

1. Self-shielded flux-cored welding wires: JC-28, JC-29, JC-29Ni1, JC-30, JC-80, etc.

This series of welding wires is flux-cored welding wire of the high-toughness self-shielded series, which is researched and developed in an innovative manner based on the actual pipeline construction demands and the current market status in China. Considering gas protection is unnecessary during welding, it is quite suitable for field construction. As the only successful bidder of similar products in China, it has been successfully applied to the national key project "Line II of West-East Natural Gas Transmission Project". Now, it is also widely applied to "Line III of West-East Natural Gas Transmission Project" and "China-Myanmar Pipeline Project". In addition, it has been applied to metallurgical blast furnace installation, high-rise steel structure construction, offshore oil platform construction, etc.

2. Metal-power gas-shielded flux-cored welding wires: JQ-YJ503MX-1, JQ-YJ621K2-1Q.

This type of welding wire is characterized by good welding performance, high deposition efficiency, low welding spatter, little slag and stable arc. It is applicable to single-wire or double-wire downward welding or flat fillet welding. Automatic high-speed welding is achievable and it also has good anti-porosity performance when being applied to welding of steel plates covered with primer and rusty surface.

3. Ultralow-hydrogen high-toughness structural steel welding rods: J507RH, J557RH, J607RH, JQ.J607RHQG, J707RH, J807RH, etc.

This series of welding rods is of ultralow-hydrogen, high-toughness type, characterized by good welding performance, stable arc, uniform coating melting, low spatter, easy slag removal and beautiful weld joint appearance; in addition, the deposited metal contains extremely low diffusible hydrogen, which makes it have good crack resistance, as well as comprehensive mechanical properties and excellent low temperature impact toughness under low temperature. Its current adjustment range is wide and all-position welding is possible.

JQ.J607RHQG still owns relatively high impact toughness at -60°C .

J707RH still owns relatively high impact toughness at -50°C .

4. Products of stainless steel flux-cored welding wire series:

This series of welding wires is of CO₂-shielded ultra-low carbon stainless steel flux-cored type and it is classified into the conventional stainless steel flux-cored

welding wire, the stainless steel flux-cored welding wire with white weld joint and the cryogenic stainless steel flux-cored welding wire.

Considering the deposited metal of the conventional stainless steel flux-cored welding wires (Q-308L, JQ-309L, JQ-316L, JQ-317L, JQ-347L, JQ-2209, etc.) has stable mechanical properties, this type of wire has good intergranular corrosion resistance, crack resistance and operation performance. Besides, its welding efficiency is also high.

In addition to features of the conventional stainless steel flux-cored welding wires, after welding of the stainless steel flux-cored welding wire with white weld joint (LH-308L, LH-309L and LH-316L), the generated weld joint appearance is free from the oxidation tint (bright silver), therefore, the weld joint cleaning and processing procedures required after welding of conventional stainless steel welding materials is unnecessary for this type of welding wires.

The cryogenic stainless steel flux-cored welding wire (JQ-308LT and JQ-316LT) is mainly applied to welding of structural materials used in cryogenic low-temperature environment in the CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment field, because it has good and stable low temperature impact performance at -196°C .

5. High-strength gas-shielded solid welding wires: JQ.MG60-G, JQ.MG60-G-1, JQ.MG70-G, JQ.MG70-G-1, JQ.MG70-G-2, JQ.MG80-G, JQ.MG80-G-1, JQ.MG90-G, etc.

The Mn-Si-Ni-Mo-Cr alloy system is adopted for this series of welding wires for reinforcement so that the tensile strength can reach 620-890 MPa. After addition of proper amount of refined grains of microelements, the low-temperature impact toughness of the deposited metal becomes good. This series of welding wires is characterized by good operability, stable arc, low spatter and beautiful weld joint appearance. Now, it is widely applied to industries of coal machine, heavy-duty machinery, water and electricity, etc.

6. Welding wires for automatic welding of pipeline

This series of welding wires for full-automatic welding of pipeline can be classified into three categories: Metal-powder-cored flux-cored welding wires (JQ-70M and JQ-80M), rich argon-shielded flux-cored welding wires (JQ-81T1M and JQ-91T1M) and gas-shielded solid welding wires (JQ.X70 and JQ.X80). These three categories of welding wires are especially suitable for semi-automatic and full-automatic root welding, filling and cosmetic welding of long-distance transport pipelines. Among which, JQ-81T1M gas-shielded flux-cored welding wires and JQ-70M

Brief introduction of welding rod, coating and slag series

Coating and slag series	Conform to China GB	Equivalent to US AWS	Model of welding rod	Characteristics of welding rod
Titanium-type slag series	EXX13	EXX13	JXX1	The coating contains more than 36% of titanium dioxide, as well as silicate, carbonate, ferromanganese, cellulose, etc. The arc is stable, restarting a weld is easy, the shape is good, and the depth of fusion is shallow. It is suitable for all-position welding, especially for light gauge welding. Plasticity and crack resistance of the deposited metal are poorer than those of the titanium-calcium type. The power supply for welding is AC or DC straight polarity or reversed polarity.
	EXX14	EXX14	JXXFe	The type of the coating is the same as above, and the iron powder is additionally added. The deposition efficiency is high and all-position welding is possible. In addition, the power supply for welding is the same as above.
	EXX24	EXX24	JXXFe15 JXXFe18	The amount of iron powder added to the coating is more than that of EXX14. Therefore, the coating is thick and the deposition efficiency is higher, reaching 150-180%. It is suitable for downward welding and flat fillet welding. The power supply for welding is the same as above.
Titanium-calcium type	EXX03 EXXX-16 EDXX-03		JXX2 RXX2 AXX2 DXX2	The coating contains about 30% of titanium dioxide and about 20% of calcium carbonate, as well as silicate, ferromanganese, etc. The arc is stable, restarting a weld is easy, spatter is low, the slag has good fluidity, weld ripples are smooth, the slag is easy to be removed, and the depth of fusion is moderate. Welding rods of this type are suitable for all-position welding, and have good crack resistance and low temperature impact toughness. The power supply for welding is AC or DC straight polarity or reversed polarity.
	EXX23		JXX2Fe16 JXX2Fe18	The type of the coating is the same as above, and the iron powder is additionally added. The deposition efficiency is high, reaching 110-180% in general and it is suitable for downward welding and flat fillet welding. The power supply for welding is the same as above.
Ilmenite type	EXX01		JXX3	The coating contains more than 30% of ilmenite, the slag has good fluidity, the arc has blowing force, the depth of fusion is large, the slag coverage is good, slag removal is easy, spatter is general and weld ripples are smooth. It is suitable for all position welding. In addition, requirements for the welding groove are not strict, the melting speed is fast, energy consumption is small, and the power supply for welding is AC or DC straight polarity or reversed polarity.
Iron oxide type	EXX20	EXX20	JXX4	The coating contains a large amount of iron oxide, ferromanganese, etc. The blowing force of arc is powerful, the depth of fusion is large, the arc is stable, restarting a weld is easy, the melting speed is fast, and spatter is relatively high. Welding rods of this type are not suitable for light gauge welding, but suitable for downward welding and flat fillet welding, and the power supply for welding is AC or DC straight polarity.

Coating and slag series	Conform to China GB	Equivalent to US AWS	Model of welding rod	Characteristics of welding rod
Cellulose type	EXX10 EXX11	EXX10 EXX11	JXX5	The coating contains a large amount of cellulose, titanium dioxide, ferromanganese, etc., the blowing force of arc is powerful, the depth of fusion is large, the melting speed is fast, the arc is stable, arc strike is easy, and slag removal is also easy. It is suitable for backing welding, onside welding with back formation, especially suitable for vertical downward welding. The power supply for welding is EXX10 DC straight polarity, EXX11 AC or DC reversed polarity.
Low hydrogen type	EXX15 EXX16	EXX15 EXX16	JXX7 AXX7 DXX7 WXX7 RXX7 JXX6 DXX6	The main constituents of the coating are calcium carbonate and fluorite. Alkalinity of the coating is high, fluidity of the slag is good, welding performance is not as good as that of titanium type and titanium-calcium type, weld ripples are coarse, the fillet weld is slightly convex, the depth of fusion is moderate, the arc is stable and slag removal is easy. All-position welding is possible. In addition, the deposited metal has excellent crack resistance and mechanical properties, especially good low temperature impact toughness. The power supply for welding is AC or DC reversed polarity. Precautions: The weld crater shall be thoroughly cleaned, welding rods are required to keep dry and short-arc welding is adopted.
	EXX18	EXX18	JXX6Fe	The type of the coating is the same as above, and the iron powder is added on this basis. The coating is slightly thick, deposition efficiency is high and all-position welding is possible. The power supply for welding is the same as above.
	EXX28	EXX28	JXX6Fe16 JXX6Fe18	The type of the coating is the same as above, a large amount of iron powder is added on this basis, the coating is thick, and the deposition efficiency is 160%-180%. It is suitable for downward welding and flat fillet welding, and the power supply for welding is the same as above.
	EXX48	EXX48	JXX7FeXG	The type of the coating is the same as above, and it is specially used for down-vertical welding and down-vertical ring welding of pipelines. The deposition efficiency is high.
Graphite type	EDZ-X-08 EZC EZNi-1 EZNiFe-1 EZNiCu-1	ENi-C1 ENiFe-C1 ENiCu-C1	DXX8 Z208 Z308 Z408 Z508	The coating contains a large amount of graphite. This slag series is applied to part of surfacing welding rods and cast iron welding rods, so that the weld joint can obtain more free carbon and carbide, the arc is stable and arc strike is easy. When the carbon steel core wire is used, spatter is high in general, accompanied with much smoke. However, when the nickel based core wire is used, the welding performance is better, spatter is low, slag is little and all-position welding is possible. Note: Strength of the coating of the welding rod is low, the welding tail part is prone to redness, and the appropriate technology shall be adopted for welding. The power supply for welding is AC or DC reversed polarity.



Instructions on structural steel welding rods

Structural steel welding rods are suitable for welding of carbon steel and low-alloy steel.

Selection of welding rods is based on chemical composition of steel, as well as requirements for mechanical properties and crack resistance. At the same time, factors such as welding structure, steel plate thickness, working conditions, stress, and performance of welding machines shall be considered for comprehensive analysis. If necessary, conduct the welding test, formulate corresponding process measures, and then determine the selected welding rods.

1. For welding of structural steel, the welding rod corresponding to the strength grade of the steel is generally selected. At the same time, considering steel with complex structure, thick plate, large rigidity, dynamic load and poor weldability, the low hydrogen welding rod characterized by good plasticity, high impact toughness and good crack resistance is generally selected. When there are special requirements for the welding position, corresponding special welding rods, such as vertical downward welding rods, backing welding rods, and all-position welding rods for pipelines, shall be used. Iron-powder welding rods can be selected in order to increase welding efficiency.

2. If the weld joint cools down within a short period, has high strength and is easy to crack, the welding rod whose strength is one grade lower than that of the base metal can be selected.

3. In case of multi-layer welding of thick plates or normalizing treatment after welding, it is necessary to prevent occurrence of too low weld joint strength.

4. For dissimilar steel welding between low carbon steel and low-alloy steel or between low-alloy steel and low-alloy steel, the welding rod corresponding to the steel with low strength grade is generally selected, and considering the low-alloy steel factors, the low-hydrogen type is preferred.

5. For welding of medium-carbon steel, the high carbon content of steel increases the welding cracking tendency. Therefore, the low-hydrogen welding rod is used in general, supported by preheating, slow cooling and post-heating methods, as well as appropriate welding processes.

6. Cast steel has poor weldability, because its carbon content is generally high, thickness of the workpiece is large, the structure is complicated and cracking traces can be easily generated during welding. When the cast steel contains many alloying elements, such properties are more prominent. In general, low-hydrogen welding rods are selected, and meanwhile, preheating, slow cooling and other methods, together with corresponding welding processes are adopted.

7. In order to ensure welding quality, the weld crater of the workpiece shall be thoroughly cleaned, free from oil stain, rust, water, paint and dirt, which is quite important for application of low-hydrogen welding rods.

8. For low-hydrogen welding rods, they must be baked at 350-400°C for 1h before welding, and bake them immediately before use. Otherwise, a series of defects such as pores, slag inclusions and cracking traces, are easily generated. Cellulose welding rods generally do not need to be baked. Once they are affected with damp, they shall be baked at the temperature specified by the instructions before welding. However, too high temperature will damage their welding performance.

9. For low-hydrogen welding rods, repeated baking is generally not allowed to prevent the coating from getting crisp and peeling off.

10. The welding current specified in the instructions is the reference value, which shall be specifically controlled in actual operation. For example, for workpiece preheating, the current can be 5%-15% lower than the normal current, the current required for vertical welding and overhead welding is 10%-15% smaller than that for downward welding; and the current required for DC is about 10% smaller than that for AC. When a DC welding machine is used, pay attention to the polarity connected for welding as specified in the instructions; otherwise the welding process may be affected.



Concise table of structural steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
12	J421 (J38.12)	E4313	Titanium type	AC-DC	Be applied to welding of low carbon steel structures, especially suitable for intermittent welding of small thin plates and cosmetic welding which requires clean surfaces.
13	J421X (J38.10)	E4313	Titanium type	AC-DC	Be applicable to thin-plate vertical downward welding and intermittent welding.
14	J421Fe (J38.14)	E4313	Titanium type	AC-DC	Be applicable to intermittent welding of small thin plates and cosmetic welding which requires clean surface.
15	J421Fe16	E4324	Titanium type	AC-DC	Be used for downward welding. Flat fillet welding and cosmetic welding of the general low-carbon steel structures which requires clean surface.
15	J421Fe18	E4324	Titanium type	AC-DC	Be used for downward welding and flat fillet welding of the general low-carbon steel and the low-alloy steel structures with equal strength grade.
16	J422 (J40.50)	E4303	Titaniumcalcium-type	AC-DC	Be applied to welding of important low-carbon steel structures and low-alloy steel structures with equal strength grade.
17	J422Fe	E4303	Titaniumcalcium-type	AC-DC	Be applicable to welding of relatively important low-carbon steel structures.
18	J426 (J48.46)	E4316	Low hydrogen type	AC-DC	Be applied to welding of important low-carbon steel and low-alloy steel structures with equal strength grade.
19	J427 (J48.47)	E4315	Low hydrogen type	DCRP	Be applied to welding of important low-carbon steel and low-alloy steel structures with equal strength grade.
20	J427D	E4315	Low hydrogen type	DCRP	Be used for backing welding of low-carbon steel and low-alloy steel structures of corresponding strength grade.
21	J427Ni	E4315	Low hydrogen type	DCRP	Be applied to welding of important low-carbon steel and low-alloy steel structures with equal strength grade.
22	J501Fe	E5014	Titanium type	AC-DC	Be applied to welding of carbon steel and low-alloy steel, such as 10th structure
23	J501Fe15 (J38.62Fe15)	E5024	Titanium type	AC-DC	Be used for high-efficiency welding of carbon steel and low-alloy steel structures.
23	J501Fe18	E5024	Titanium type	AC-DC	Be used for high-efficiency welding of carbon steel and Grades A and D steel used by ordinary ships.
24	J502	E5003	Titaniumcalcium-type	AC-DC	Be applied to welding of 10th and low-alloy steel structures of corresponding strength.



J421 (J38.12)

Conform to: GB/T 5117 E4313
AWS A5.1 E6013
ISO 2560-B-E43 13A

Instructions: J421 is carbon steel welding rod covered with titanium oxide coating. It can be used under AC and DC and all-position welding is possible. It is characterized by excellent welding performance, good operation performance, easy weld reslagging, stable arc and beautiful weld joint appearance.

Purpose: It is used for welding of low-carbon steel structures, especially suitable for welding of small thin plates and cosmetic welding which requires beautiful and clean weld joint surface.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.079	0.38	0.21	0.018	0.024	0.020	0.032	0.005	0.010

Mechanical properties of deposited metal

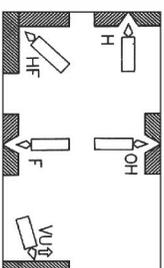
Test item	Rm (MPa)	Rel(MPa)	A(%)	KV ₂ (J) 0℃
Guarantee value	≥430	≥330	≥17	≥47
Measured value	485	380	28.5	86

X-ray radiographic inspection requirements: Level II

Reference current (AC/DC)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~70	50~90	90~130	130~210	170~230

Welding position



Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
60	J757Ni	E7015-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel of corresponding strength grade.
61	J807	E7615-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel of corresponding strength grade, such as 14MnNb.
62	J807RH	E7815-G	Low hydrogen type	DCRP	Be used for welding of important low alloy steel structures of corresponding strength grade, such as downcomers of hydropower stations, pressure vessels, bridges and marine engineering.
63	J857	E8315-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel of corresponding strength grade.
64	J857Cr	E8315-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel pressure vessels and other structures with strength equivalent to about 830MPa, such as 14CrMnMoB, 30CrMo and 36CrMo.
65	J857CrNi	E8315-G	Low hydrogen type	DCRP	It is mainly used for repair welding of defects of train couplers made of Grade E steel, as well as welding of low alloy steel structures with tensile strength equivalent to about 830MPa.
66	JQ•J857T	E8315-G P	Low hydrogen type	DCRP	It is widely applied to repair welding of defects of components such as tow hooks and hooks of railway vehicles made of Grade E cast steel.
67	J907Cr	E8815-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel pressure vessels with strength equivalent to about 880MPa and other structures.
68	J107	E9815-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel of corresponding strength grade.
69	J107Cr	E9815-G P	Low hydrogen type	DCRP	Be used for welding of low alloy high-strength steel structures with tensile strength equivalent to about 980MPa, such as 36CrMo.
70	JQ•J107T	E8815-G P	Low hydrogen type	DCRP	It can be widely used for welding of tow hooks and hooks of vehicles and repair welding of Grade E cast steel and other structures.
71	JQ•J36G	E6218-G P	Low hydrogen type	DCRP	It can be widely applied to welding of W636 and W636QV1 steel used in nuclear power and thermal power fields.
72	JQ•J427NP	E4315	Low hydrogen type	DCRP	Be used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.
73	JQ•J507NP	E5015	Low hydrogen type	DCRP	Be used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.
74	J427HIC	E4315	Low hydrogen type	DCRP	It is mainly used to support welding of Q245R (HIC) anti hydrogen steel plate.
75	J507HIC	E5015	Low hydrogen type	DCRP	It is mainly used to support welding of Q345R (HIC) anti hydrogen steel plate.



J421X (J38·10)

Conform to GB/T 5117 E4313,
AWS A5.1 E6013
ISO 2560-B-E43 13 A

Instructions:J421X is special carbon steel welding rod covered with titanium oxide coating for vertical downward welding. It can be used under AC and DC and all-position welding is possible. It is characterized by good operation performance, easy arc strike and weld restarting, stable arc, beautiful weld joint appearance and easy slag removal.

Purpose:Be applicable to welding of general carbon steel used by ships and galvanized steel sheet, especially suitable for vertical downward welding of thin plates and intermittent welding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.20	≤0.30	≤0.30	≤0.08
Measured value	0.080	0.40	0.22	0.014	0.022	0.018	0.026	0.008	0.007

Mechanical properties of deposited metal

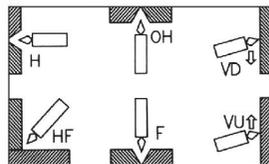
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥430	≥330	≥16	—
Measured value	485	390	27	76

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~100	90~130	150~210	170~230

Welding position



J421Fe (J38·14)

Conform to GB/T 5117 E4313,
AWS A5.1 E6013
ISO 2560-B-E43 13 A

Instructions:J421Fe is carbon steel welding rod covered with iron powder titanium oxide coating. It can be used under AC and DC and all position welding is possible. It is characterized by excellent welding performance, extremely low spatter, easy weld restarting and easy slag removal; The weld joint appearance is beautiful and the deposition efficiency is relatively high.

Purpose:It is used for welding of general low-carbon steel structures, especially suitable for intermittent welding of small thin plates and short weld joints and cosmetic welding which requires clean weld joint surface.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.085	0.39	0.24	0.013	0.020	0.022	0.032	0.010	0.006

Mechanical properties of deposited metal

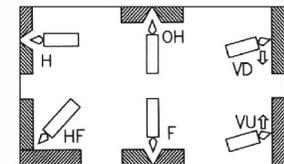
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥430	≥330	≥16	—
Measured value	490	420	30	79

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	100~150	150~220	180~240

Welding position





J421Fe16 J421Fe18

Conform to GB/T 5117 E4324
ISO 2560-B-E43 24 A

Instructions:J421Fe16 and J421Fe18 are carbon steel welding rods covered with iron-powder titanium oxide coating. They can be used under AC and DC and are applicable to downward welding and flat fillet welding. It is easy to restart a weld, spatter is low and slag removal is easy. The weld joint appearance is beautiful, and the deposition efficiency respectively reaches about 160% and 180%.

Purpose:They are used for downward welding and flat fillet welding of general low-carbon steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.077	0.78	0.40	0.014	0.023	0.025	0.035	0.007	0.008

Mechanical properties of deposited metal

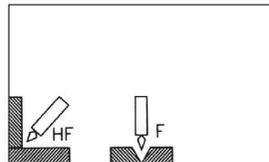
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)
				Normal temperature
Guarantee value	≥430	≥330	≥16	—
Measured value	510	420	26	96

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	110~160	160~240	210~270

Welding position



J422 (J40·50)

Conform to GB/T 5117 E4303
ISO 2560-B-E 43 03 A

Instructions:J422 is carbon steel welding rod covered with titanium-calcium coating. It can be used under AC and DC and all-position welding is possible. It owns excellent welding performance and good mechanical properties; it is characterized by stable arc, low spatter, easy slag removal, as well as easy weld restarting; the weld joint appearance is beautiful, wide, narrow, thin and thick weld ripples are all possible, welding operation is easy with high efficiency.

Purpose:It is used for welding of relatively important low-carbon steel structures, and low-alloy steel structures of low strength grade such as Q235, 09MnV and 09Mn2.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.078	0.39	0.18	0.018	0.023	0.020	0.032	0.008	0.005

Mechanical properties of deposited metal

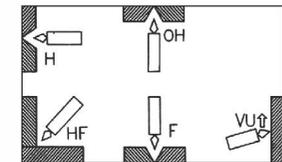
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)	
				0 C	-20 C
Guarantee value	≥430	≥330	≥20	≥27	≥47
Measured value	475	390	29.5	97	73

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~70	60~100	80~140	160~220	200~240

Welding position





J422Fe

Conform to GB/T 5117 E4303
ISO 2560-B-E 43 03 A



J426 (J48-46)

Conform to GB/T 5117 E4316
ISO 2560-B-E 43 16 A

Instructions:J422Fe is carbon steel welding rod covered with ironpowder titanium-calcium coating. It can be used under AC and DC and all-position welding is possible. It is characterized by stable arc, low spatter, easy slag removal, as well as easy weld restarting; The weld jointappearance is beautiful and the deposition efficiency is relatively high.

Purpose:It is applicable to welding of relatively important lowcarbon steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.080	0.40	0.21	0.019	0.023	0.015	0.026	0.007	0.008

Mechanical properties of deposited metal

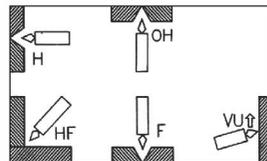
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥430	≥330	≥20	≥27
Measured value	490	390	29	79

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	80~140	140~220	180~240

Welding position



Instructions:J426 is carbon steel welding rod covered with lowhydrogen potassium coating. It can be used under AC and DC and allposition welding is possible. Its deposited metal has excellent mechanical properties and crack resistance, as well as good low temperature impact toughness.

Purpose:It is used for welding of important low-carbon steel and lowalloy steel structures such as ships, bridges and pressure vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.062	0.83	0.30	0.010	0.019	0.031	0.030	0.007	0.018

Mechanical properties of deposited metal

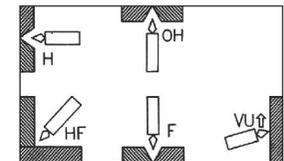
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥430	≥330	≥20	≥27
Measured value	495	395	33	172

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2. 5	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	60~100	80~140	110~210	160~230

Welding position



Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must beremoved before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.



J427 (J48·47)

Conform to GB/T 5117 E4315
ISO 2560-B-E 43 15 A

Instructions:J427 is carbon steel welding rod covered with lowhydrogen sodium coating. Adopt DCRP and all-position welding is possible. Its deposited metal has excellent mechanical properties and crack resistance, as well as good low temperature impact toughness.

Purpose:It is used for welding of important pressure load or low-carbon steel thick-plate structures and low-alloy steel structures such as machinery, ships, bridges and pressure vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.075	0.84	0.60	0.010	0.022	0.031	0.030	0.007	0.013

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)	
				-20 C	-30 C
Guarantee value	≥430	≥330	≥20	≥47	≥27
Measured value	525	440	30	178	142

X-ray radiographic inspection requirements: Level I

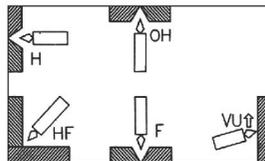
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~100	80~140	110~210	160~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



J427D

Conform to GB/T 5117 E4315
ISO 2560-B-E 43 15 A

Instructions:J427D is special carbon steel welding rod for backing welding covered with low-hydrogen sodium coating. Adopt DCRP. The characteristics of the welding rod include: The arc has certain blowing force. When backing welding is performed, adopt single-side welding with back formation. In addition, arc is stable, slag removal is easy and the weld joint generated on the back side is beautiful. Select appropriate process to prevent defects such as pores and slag inclusion.

Purpose:It is exclusively used for backing welding of carbon steel and low-alloy steel structures of corresponding strength.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.056	0.70	0.50	0.012	0.020	0.032	0.032	0.005	0.015

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)
				-30 C
Guarantee value	≥430	≥330	≥20	≥27
Measured value	520	420	34	58

X-ray radiographic inspection requirements: Level I

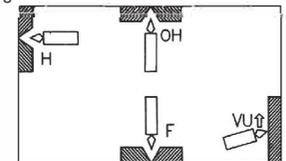
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0
Welding current (A)	60~100	80~140	110~210

Precautions:

- 1.Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, without swing, and string bead is preferred.
- 4.Arc strike shall be carried out outside the groove and the arc shall be extinguished at another place after the molten bath is full.

Welding position





J427Ni

Conform to GB/T 5117 E4315
ISO 2560-B-E 43 15 A

Instructions:J427Ni is carbon steel welding rod covered with lowhydrogen sodium coating. Adopt DCRP and all-position welding is possible. It is characterized by excellent low temperature impact toughness of the weld metal.

Purpose:It is used for welding of important structures of low carbon steel and low-alloy steel of corresponding strength, such as steel for shipbuilding (Q235 series Grades A, B, D and E), boilers, bridges,pressure vessels and other structures subjected to dynamic loads under low temperature conditions.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.70	≤0.20	≤0.30	≤0.08
Measured value	0.068	0.95	0.26	0.007	0.018	0.37	0.030	0.002	0.012

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥430	≥330	≥20	≥27
Measured value	530	450	29	187

X-ray radiographic inspection requirements: Level I

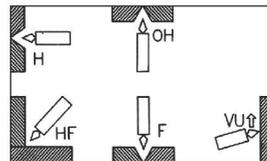
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0
Welding current (A)	60~100	80~140	110~210

Precautions:

- 1 Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must beremoved before welding.
- 3.It is advisable to select the single pass welding method, avoiding swing.

Welding position



J501Fe

Conform to GB/T 5117 E5014
AWS A5.1 E7014
ISO 2560-B-E 49 14 A

Instructions:J501Fe is carbon steel welding rod covered with ironpowder titanium oxide coating. The deposition efficiency is about 110%.It can be used under AC and DC and all-position welding is possible. It is characterized by excellent welding performance, stable arc, low spatter and easy slag removal; The weld joint appearance is beautiful.

Purpose:It is used for welding of carbon steel and low-alloy structures,such as welding of ships, vehicles and mechanical structures of 16Mn, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.25	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.087	0.65	0.25	0.014	0.024	0.032	0.032	0.005	0.015

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥490	≥400	≥16	—
Measured value	530	435	25	69

X-ray radiographic inspection requirements: Level II

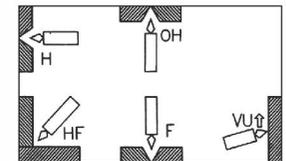
Reference current (AC,DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	70~90	90~130	160~210	210~250

Precautions:

- 1.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 2.Welding rods that have been stored for a very long period shall be baked for 1h at 180-200°C before welding.

Welding position





J501Fe15 J501Fe18

Conform to GB/T 5117 E5024
AWS A5.1 E7024
ISO 2560-B-E 49 24 A



J502

Conform to GB/T 5117 E5003
ISO 2560-B-E 49 03 A

Instructions:J501Fe15 and J501Fe18 are high-efficient carbon steel welding rods covered with iron-powder titanium oxide coating. The deposition efficiency is about 150% and 180% respectively. They can be used under AC and DC and are suitable for fillet welding in the flat position, downward welding and flat fillet welding. They are characterized by stable arc, low spatter, easy slag removal and beautiful weld joint appearance.

Purpose:They are used for welding of carbon steel and low-alloy structures, such as welding of ships, rolling stock and boilers of Grades A,B and D steel, 16Mn, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.25	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.081	0.90	0.48	0.010	0.023	0.032	0.030	0.005	0.014

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥490	≥400	≥16	≥47
Measured value	540	465	29	79

X-ray radiographic inspection requirements: Level II

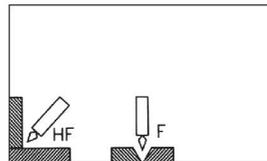
Reference current (AC.DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~130	130~160	140~200	160~220

Precautions:

- 1.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 2.Welding rods that have been stored for a very long period shall be baked for 1h at 180-200°C before welding.

Welding position



Instructions:J502 is carbon steel welding rod covered with titaniumcalcium coating. It can be used under AC and DC and all-position welding is possible. It is characterized by excellent welding performance and mechanical properties, stable arc, low spatter and easy slag removal;The weld joint appearance is beautiful.

Purpose:It is mainly used for welding of low-alloy steel structures with tensile strength grade of 490N / mm², such as welding of screwthreaded steel used in construction and other structural steel of 16Mn, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.25	≤0.90	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.10	0.76	0.27	0.015	0.022	0.025	0.036	0.010	0.008

Mechanical properties of deposited metal

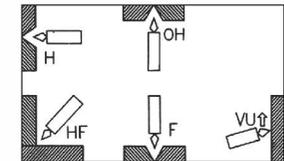
Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥490	≥400	≥20	≥47
Measured value	530	435	24	96

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	80~140	140~220	180~240

Welding position





J506 (J48·56)

Conform to GB/T 5117 E5016
AWS A5.1 E7016
ISO 2560-B-E 49 16 A

Instructions:J506 is carbon steel welding rod covered with lowhydrogen potassium coating. It can be used under AC and DC and allposition welding is possible. It is characterized by good welding performance, stable arc, low spatter and easy slag removal. Its deposited metal has excellent mechanical properties and crack resistance, and its low temperature impact toughness is good.

Purpose:It is used for welding of medium-carbon steel and low-alloy steel structures, such as 16Mn, 09Mn2Si and Grades A, B, D and E steel for shipbuilding, as well as welding of thick plates and carbon steelstructures with poor weldability.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.75	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.080	1.05	0.51	0.012	0.020	0.012	0.030	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)	
				-20 C	-30 C
Guarantee value	≥490	≥400	≥20	≥47	≥27
Measured value	545	440	32	175	169

X-ray radiographic inspection requirements: Level I

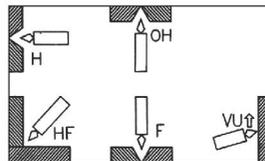
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	80~140	110~210	160~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



J506R

Conform to NB/T 47018 E5016
GB/T 5117 E5016
AWS A5.1 E7016
ISO 2560-B-E 49 16 A

Instructions:J506R is carbon steel welding rod covered with lowhydrogen potassium coating that is exclusive for pressure vessels. It can be used under AC and DC and allows all-position welding. It is characterized by good welding performance, stable arc, low spatter and easy slag removal. Its deposited metal has good mechanical properties and crack resistance, and its low temperature impact toughness is good.

Purpose:It is used for welding of medium-carbon steel and low-alloy steel structures such as pressure vessels and pressure-bearing pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.75	≤0.015	≤0.025	≤0.30	≤0.20	≤0.30	≤0.080
Measured value	0.078	0.96	0.54	0.007	0.013	0.008	0.028	0.007	0.004

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)
				-30 C
Guarantee value	490~610	≥400	≥22	≥54
Measured value	540	440	32	170

Water content of the coating: ≤0.35%

X-ray radiographic inspection requirements: Level I

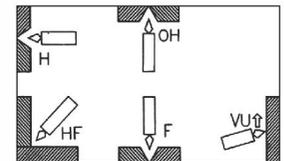
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~130	140~180	180~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc and string bead are preferred for welding.

Welding position





JQ·J506D

Conform to GB/T 5117 E5016
AWS A5.1 E7016
ISO 2560-B-E 49 16 A

Instructions:JQ.J506D is special carbon steel welding rod for backing welding covered with low-hydrogen potassium coating. This model of welding rods has the feature that the arc has certain blowing force. In addition, when backing welding is performed, adopt single-side welding with back formation. Meanwhile, arc is stable, slag removal is easy and the weld joint generated on the back side is beautiful, which can avoid root chipping and sealing run, beneficial to improving work efficiency, but it is not suitable for multi-layer welding.

Purpose:It is exclusively used for backing welding of the groove of carbon steel and low-alloy steel structures, such as 16Mn, 09Mn2Si and Grades A, B, D, and E steel used for shipbuilding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.75	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.072	0.93	0.43	0.009	0.017	0.025	0.028	0.006	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	530	435	26	90

X-ray radiographic inspection requirements: Level I

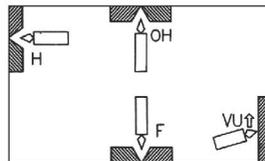
Reference current (backing welding)(DC[±])

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0
Welding current (A)	50~80	70~100	100~160

Precautions:

1. Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, without swing, and string bead is preferred.

Welding position



J506Fe

Conform to GB/T 5117 E5018
AWS A5.1 E7018
ISO 2560-B-E 49 18 A

Instructions:J506Fe is carbon steel welding rod covered with iron powder low-hydrogen potassium coating, and it can be used under AC and DC. Since the coating contains iron powder, the deposition efficiency can be improved. Arc is stable, spatter is low, slag removal is easy, process performance is good, the deposited metal has good mechanical properties, and all-position welding is possible.

Purpose:It is used for welding of carbon steel and low-alloy steel structures, such as 16Mn.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.077	1.07	0.54	0.005	0.014	0.011	0.028	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	550	455	32	156

X-ray radiographic inspection requirements: Level I

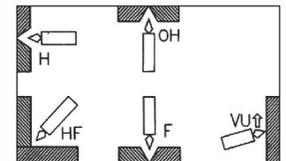
Reference current (AC,DC[±])

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	80~140	110~210	160~230

Precautions:

1. Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





J506Fe-1

Conform to GB/T 5117 E5018-1
AWS A5.1 E7018-1
ISO 2560-B-E 49 18-1A

Instructions:J506Fe-1 is carbon steel welding rod covered with iron powder low-hydrogen potassium coating. It can be used under AC and DC and all-position welding is possible. Due to addition of a large number of alloying elements, it has good plasticity and low temperature impact toughness, together with good welding performance, stable arc, low spatter, easy slag removal and high deposition efficiency.

Purpose:It is applicable to welding of carbon steel and low-alloy steel structures such as offshore oil platforms and ocean-going vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.069	1.20	0.36	0.006	0.016	0.26	0.031	0.008	0.017

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)	
				-40C	-45C
Guarantee value	≥490	≥400	≥20	≥47	≥27
Measured value	535	440	33	190	184

X-ray radiographic inspection requirements: Level I

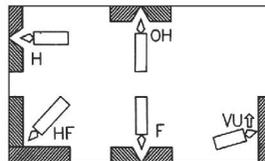
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	90~140	160~210	180~240

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



J506Fe16 J506Fe18

Conform to GB/T 5117 E5028
AWS A5.1 E7028
ISO 2560-B-E 49 28 A

Instructions:J506Fe16 and J506Fe18 are high-efficiency carbon steel welding rods covered with iron powder low-hydrogen potassium coating, of which, deposition efficiency can reach about 160% and 180% respectively. In addition, they can be used under AC and DC. They are characterized by deposited metal with good mechanical properties, stable arc, low spatter, easy slag removal and beautiful weld joint appearance. They are suitable for downward welding and flat fillet welding.

Purpose:They are used for downward welding and flat fillet welding of carbon steel and low-alloy steel structures, such as 16Mn, 09Mn2Si and Grades A, B, D, and E steel used for shipbuilding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.077	1.03	0.35	0.005	0.014	0.011	0.028	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)
				-20C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	535	430	26	189

X-ray radiographic inspection requirements: Level II

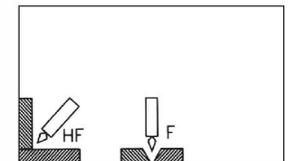
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 4.0	Φ 5.0
Welding current (A)	180~240	210~280

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding and swing shall be avoided.

Welding position





J507 (J48-57)

Conform to GB/T 5117 E5015
AWS A5.1 E7015
ISO 2560-B-E 49 15 A

Instructions:J507 is carbon steel welding rod covered with low hydrogen sodium coating. Adopt DCRP and all-position welding is possible. It is characterized by good welding performance, stable arc, low spatter and easy slag removal. Its deposited metal has excellent mechanical properties and crack resistance, and its low temperature impact toughness is good.

Purpose:It is used for welding of important medium-carbon steel and low-alloy steel structures (pressure, dynamic load), such as 16Mn, 09Mn2Si, 09Mn2V and Grades A, B, D and E steel for shipbuilding, as well as welding of thick plates and carbon steel structures with poor weldability.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.087	1.12	0.58	0.012	0.021	0.011	0.028	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)	
				-20 C	-30 C
Guarantee value	≥490	≥400	≥20	≥47	≥27
Measured value	560	450	32	150	142

X-ray radiographic inspection requirements: Level I

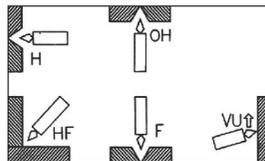
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~100	80~140	110~210	160~230

Precautions:

- 1.Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



J507R

Conform to NB/T 47018 E_61F
GB/T 5117 E5015
AWS A5.1 E7015
ISO 2560-B-E 49 15 A

Instructions:J507R is carbon steel welding rod covered with low hydrogen sodium coating exclusive for pressure vessels. Adopt DCRP and all-position welding is possible. In addition, It is characterized by excellent welding performance, stable arc, low spatter, easy slag removal, and its deposited metal has excellent mechanical properties and crack resistance, as well as good low temperature impact toughness.

Purpose:It is used for welding of medium-carbon steel and low-alloy steel structures such as pressure vessels and pressure-bearing pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.75	≤0.015	≤0.025	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.070	1.20	0.62	0.008	0.012	0.010	0.032	0.008	0.004

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J)
				-30 C
Guarantee value	490~610	≥400	≥22	≥54
Measured value	545	450	32	150

Water content of the coating: ≤0.35%

X-ray radiographic inspection requirements: Level I

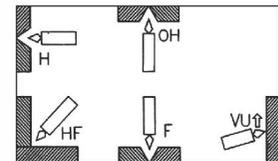
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~130	140~180	180~230

Precautions:

- 1.Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc and string bead are preferred for welding.

Welding position





J507Fe16

Conform to GB/T 5117 E5028
AWS A5.1 E7028
ISO 2560-B-E 49 28 A



J507X

Conform to GB/T 5117 E5015
AWS A5.1 E7015
ISO 2560-B-E 49 15 A

Instructions:J507Fe16 is high-efficiency carbon steel welding rod covered with iron powder low-hydrogen sodium coating. The deposition efficiency is about 160%. Adopt DCRP and it is suitable for downward welding and flat fillet welding. They are characterized by deposited metal with good mechanical properties, stable arc, low spatter, easy slag removal and beautiful weld joint appearance.

Purpose:It is used for downward welding and flat fillet welding of carbon steel and low-alloy steel structures, such as 16Mn, 09Mn2Si, 09Mn2V and Grades A, B, D, and E steel for shipbuilding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.086	1.13	0.55	0.012	0.021	0.011	0.028	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -20C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	560	450	30	147

The water content of the coating is ≤0.60%

X-ray radiographic inspection requirements: Level II

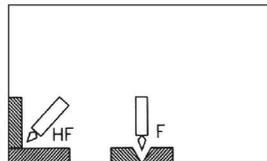
Reference current (DC⁺)

Welding rod diameter (mm)	Φ4.0	Φ5.0
Welding current (A)	180~240	210~280

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding and swing shall be avoided.

Welding position



Instructions:J507X is special carbon steel welding rod covered with low-hydrogen sodium coating for vertical downward fillet weld. Adopt DCRP and it has good welding performance. Vertical downward welding is dominant. During welding, it is required to move from top to bottom. The arc is stable, slag removal is easy, weld ripples are uniform and weld joint appearance is beautiful.

Purpose:It is applicable to welding of vertical downward fillet weld of carbon steel and low-alloy steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.067	0.70	0.46	0.012	0.013	0.27	0.028	0.007	0.016

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL(MPa)	A(%)	KV ₂ (J) -30C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	560	432	30	112

X-ray radiographic inspection requirements: Level I

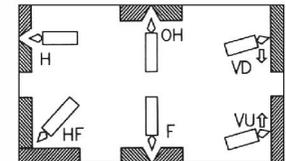
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~130	110~180	160~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, dragging downward in a straight way, generally not allowing swing or allowing slight swing.

Welding position





J506RH

Conform to GB/T 5117 E5016-N1 P
AWS A5.5 E7016-G
ISO 2560-B-E 49 16-N1 P

Instructions:J506RH is high toughness ultra-low-hydrogen low-alloy steel welding rod covered with low-hydrogen potassium coating, which can be used under AC and DC. It is characterized by good welding process, stable arc, easy slag removal, and its deposited metal has excellent plasticity, toughness and crack resistance. All-position welding is possible.

Purpose:It is applicable to welding of important structures of low-alloy steel, such as E36, DE36 and A537. Such as offshore platforms, ships and pressure vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	V
Guarantee value	≤0.12	0.60-1.60	≤0.90	≤0.030	≤0.030	0.30-1.00	≤0.35	≤0.050
Measured value	0.065	1.13	0.28	0.006	0.015	0.65	0.009	0.005

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥390	≥20	≥27
Measured value	550	450	30	138

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

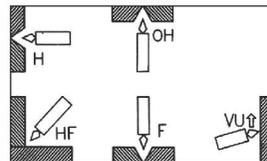
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150°C thermostat. They shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



J507RH

Conform to GB/T 5117 E5015-N1 P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P

Instructions:J507RH is high toughness ultra-low-hydrogen low-alloy steel welding rod covered with low-hydrogen sodium coating, and it adopts DCRP. It is characterized by good welding process, stable arc, easy slag removal, and its deposited metal has excellent plasticity, toughness and crack resistance. All-position welding is possible.

Purpose:It is applicable to welding of important structures of low-alloy steel, such as E36, DE36 and A537. Such as offshore platforms, ships and pressure vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	V
Guarantee value	≤0.12	0.60-1.60	≤0.90	≤0.030	≤0.030	0.30-1.00	≤0.35	≤0.050
Measured value	0.073	1.15	0.53	0.006	0.015	0.55	0.010	0.005

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥390	≥20	≥27
Measured value	550	445	29	130

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

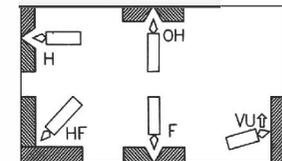
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at 400 °C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





J507Ni

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P



J507Q

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P

Instructions:J507Ni is low-alloy steel welding rod covered with lowhydrogen sodium coating. Adopt DCRP and all-position welding is possible. It has low diffused hydrogen content and excellent low temperature impact toughness.

Purpose:It is applicable to welding of medium-carbon steel and lowtemperature steel pressure vessels, such as 16MnDR.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	1.00-2.00
Measured value	0.071	1.05	0.50	0.006	0.014	1.30

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	575	465	30	167

X-ray radiographic inspection requirements: Level I

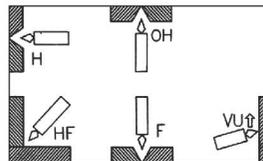
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	90~120	120~180	160~210

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Instructions:J507Q is special low-alloy steel welding rod covered with low-hydrogen sodium coating for ultra-low-hydrogen high-toughness bridge steel. Adopt DCRP. It has good welding performance and allows all-position welding, and the weld metal is characterized by excellent plasticity, toughness and crack resistance.

Purpose:It is used for welding of low-alloy bridge steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.10	≤1.60	≤0.70	≤0.020	≤0.030	1.00-2.00
Measured value	0.065	1.0	0.38	0.008	0.016	1.40

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥390	≥22	≥47
Measured value	550	460	30	120

X-ray radiographic inspection requirements: Level I

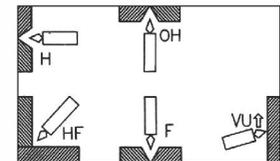
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	80~120	130~180	170~240

Precautions:

- 1.The welding rods must be baked at 350-400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J507FeNi

Conform to GB/T 5117 E5018-G P
AWS A5.5 E7018-G
ISO 2560-B-E 49 18-G P

Instructions:J507FeNi is low-alloy steel welding rod covered with iron powder low-hydrogen coating. Adopt DCRP and all-position welding is possible. It has low diffused hydrogen content and excellent low temperature impact toughness.

Purpose:It is applicable to welding of medium-carbon steel and low temperature steel pressure vessels, such as 16MnDR

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	1.00-2.00
Measured value	0.070	1.12	0.25	0.006	0.016	1.40

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	575	460	30	140

X-ray radiographic inspection requirements: Level I

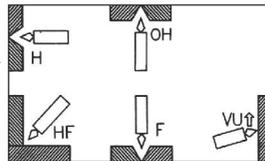
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	120~180	160~210

Precautions:

1. The welding rods must be baked for 1h at about 350°C before use and they shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



J507CrNi

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P

Instructions:J507CrNi is low-alloy steel welding rod covered with low hydrogen sodium coating which can resist seawater corrosion, with good plasticity, low temperature toughness and seawater corrosion resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is applicable to welding of important marine structures with seawater corrosion resistance of Q235, 16Mn and Cr-Al systems.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	0.50-0.90	0.20-0.50	0.20-0.50
Measured value	0.065	0.95	0.33	0.006	0.016	0.70	0.42	0.30

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	565	465	26	136

X-ray radiographic inspection requirements: Level I

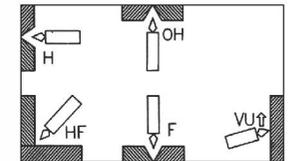
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is adopted for welding.

Welding position





J507NiTiB

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P



J507Mo

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E-49 15-G P

Instructions:J507NiTiB is high-toughness low-alloy steel welding rod covered with low-hydrogen sodium coating. Its deposited metal contains Ni-Ti-B elements, which makes it have excellent impact toughness at low temperature. The welding rod has good process performance. Adopt DCRP and all-position welding is possible.

Purpose:It is applied to welding of ships, boilers, pressure vessels, mining engineering machinery, offshore engineering structures and other important structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Ti	B
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	0.30-0.80	0.010-0.040	0.001-0.004
Measured value	0.056	1.14	0.26	0.005	0.014	0.56	0.027	0.003

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	545	455	30	155

X-ray radiographic inspection requirements: Level I

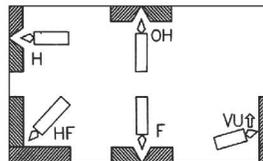
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	80~130	120~190	160~230

Precautions:

- 1.Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is adopted for welding, and string bead is preferred.

Welding position



Instructions:J507Mo is low-alloy steel welding rod covered with lowhydrogen sodium coating, resisting H₂S corrosion. Adopt DCRP and allposition welding is possible. Its deposited metal has good corrosion resistance and crack resistance, as well as good welding performance.

Purpose:It is applicable to welding of corrosion resistant steel containing elements such as Mo, V or low Al. Such as welding of 12CrMoVAI and steel that can resist high temperature of 400 °C and S and H₂S corrosion.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo	V
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	0.30-0.80	≤0.20
Measured value	0.054	0.78	0.27	0.011	0.018	0.46	0.11

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	560	460	30	132

X-ray radiographic inspection requirements: Level I

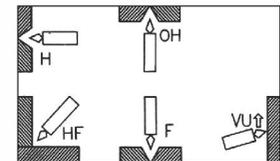
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~130	110~180	160~210

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J507MoW

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G
ISO 2560-B-E 49 15-G P

Instructions:J507MoW is low-alloy steel welding rod covered with lowhydrogen sodium coating, resisting H, N and NH₃ corrosion. Adopt DCRP and all-position welding is possible. Its deposited metal has good corrosion resistance and welding performance.

Purpose:It is used for welding of low-alloy steel containing such elements as Mo, W, Nb and V and resisting H, N and NH₃ corrosion under high temperature and high pressure, such as welding of 10MoWVNb resisting hydrogen corrosion under high temperature and high pressure or steel resisting H, N and NH₃ corrosion under high temperature and high pressure.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo	W	V	Nb
Guarantee value	≤0.10	≤0.80	≤0.50	≤0.020	≤0.020	0.50-0.90	0.50-0.90	≤0.20	≤0.12
Measured value	0.052	0.78	0.27	0.006	0.012	0.53	0.54	0.11	0.050

Mechanical properties of deposited metal (740°C × 2.5h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0 C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	650	560	23	60

X-ray radiographic inspection requirements: Level I

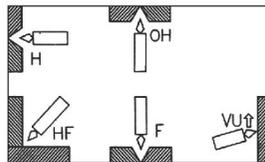
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	110~180	160~210

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.
4. The medium-thickness weldment shall be preheated at about 150°C before welding, and tempered at 740°C after welding.

Welding position



J556

Conform to GB/T 5117 E5516-G P
AWS A5.5 E8016-G
ISO 2560-B-E 55 16-G P

Instructions:J556 is low-alloy steel welding rod covered with lowhydrogen potassium coating and it can be used under AC and DC. Allposition welding is possible.

Purpose:It is applicable to welding of medium-carbon steel and lowalloy steel structures, such as 15MnTi and 15MnV.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P
Guarantee value	≤0.12	≤1.60	≤0.90	≤0.030	≤0.030
Measured value	0.073	1.38	0.25	0.006	0.015

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	575	485	26	136

X-ray radiographic inspection requirements: Level I

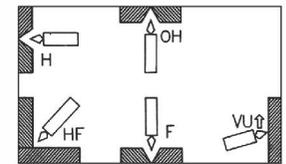
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~140	110~210	160~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





J556RH

Conform to GB/T 5117 E5516-N1 P
AWS A5.5 E8016-G
ISO 2560-B-E 55 16-N1 P



J557

Conform to GB/T 5117 E5515-G P
AWS A5.5 E8015-G
ISO 2560-B-E 55 15-G P

Instructions:J556RH is high-toughness welding rod covered with ultralow hydrogen potassium coating. Its deposited metal has excellent plasticity, toughness and crack resistance. It can be used under AC and DC, but it is recommended to adopt DCRP and all-position welding is possible.

Purpose:It is applicable to important low-alloy steel structures such as pressure vessels, offshore production platforms and ships.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	V
Guarantee value	≤0.12	0.60-1.60	≤0.90	≤0.030	≤0.030	0.30-1.00	≤0.35	≤0.050
Measured value	0.076	1.10	0.22	0.004	0.017	0.81	0.15	0.005

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	590	500	28	108

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

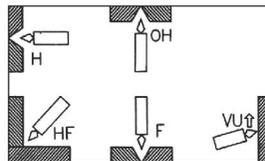
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~140	130~180	170~240

Precautions:

1. The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150°C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding.

Welding position



Instructions:J557 is low-alloy steel welding rod covered with lowhydrogen sodium coating and it adopts DCRP. All-position welding is possible.

Purpose:It is applicable to welding of medium-carbon steel and lowalloy steel structures, such as 15MnTi and 15MnV.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P
Guarantee value	≤0.12	≤1.60	≤0.90	≤0.030	≤0.030
Measured value	0.074	1.32	0.50	0.007	0.015

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	585	485	28	120

X-ray radiographic inspection requirements: Level I

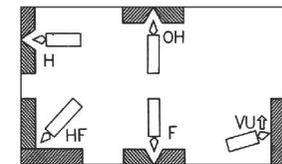
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~140	110~210	160~230

Precautions:

1. Welding rods must be baked at 350-400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





J557R

Conform to NB/T 47018 E5515-G P
GB/T 5117 E5515-G P
AWS A5.5 E8015-G
ISO 2560-B-E 55 15-G P

Instructions: J557R is low-alloy steel welding rod covered with low-hydrogen sodium coating exclusive for pressure-bearing equipment. Adopt DCRP and all-position welding is possible.

Purpose: It is applicable to welding of low-alloy steel structures of corresponding strength grade for pressure vessels.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P
Guarantee value	≤0.12	≤1.60	≤0.90	≤0.015	≤0.025
Measured value	0.076	1.40	0.48	0.006	0.011

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	550-670	≥460	≥20	≥54
Measured value	600	510	28	120

Water content of the coating: ≤0.20%

X-ray radiographic inspection requirements: Level I

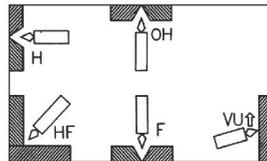
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at 350-400°C for 1.5h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



J557RH

Conform to GB/T 5117 E5515-N1 P
AWS A5.5 E8015-G
ISO 2560-B-E 55 15-N1 P

Instructions: J557RH is high-toughness welding rod covered with ultra-low hydrogen sodium coating. Its deposited metal has excellent plasticity, toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose: It is applicable to important low-alloy steel structures such as pressure vessels, offshore production platforms and ships.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	V
Guarantee value	≤0.12	0.60-1.60	≤0.90	≤0.030	≤0.030	0.30-1.00	≤0.35	≤0.050
Measured value	0.068	1.25	0.30	0.007	0.016	0.80	0.20	0.006

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	600	510	28	120

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g

(thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

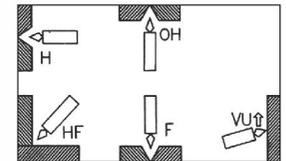
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





JQ·J557RH

Conform to GB/T 5117 E5515-G.P
AWS A5.5 E8015-G
ISO 2560-B-E 55 15-G P



J606

Conform to GB/T 32533 E5916-3M2 P
AWS A5.5 E9016-D1
ISO 18275-B-E 59 16-3 M2 P

Instructions:JQ·J557RH is high-toughness welding rod covered with ultra-low hydrogen sodium coating. Its deposited metal has excellent plasticity, toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is applicable to important low-alloy steel structures such as pressure vessels, offshore production platforms and ships.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	1.00-1.70	≤0.50	≤0.015	≤0.020	0.80-1.30	≤0.30
Measured value	0.060	1.27	0.28	0.006	0.015	1.20	0.10

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -50 C
Guarantee value	≥550	≥460	≥20	≥60
Measured value	590	500	28	110

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g
(thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

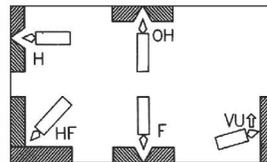
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	80~120	130~180	170~240

Precautions:

- The welding rods must be baked at 400 °C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- Short arc operation is required for welding, and string bead is preferred.

Welding position



Instructions:J606 is low-alloy high-strength steel welding rod covered with low-hydrogen potassium coating. It can be used under AC and DC. In case of AC welding, its performance stability is slightly poorer than that of DC welding.

Purpose:It is used for welding of medium-carbon steel and low-alloy steel of corresponding strength, such as 15MnVN.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.12	1.25-1.75	≤0.60	≤0.030	≤0.030	0.25-0.45
Measured value	0.075	1.33	0.25	0.006	0.015	0.40

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	≥620	≥530	≥17	≥27
Measured value	660	570	24	75

X-ray radiographic inspection requirements: Level I

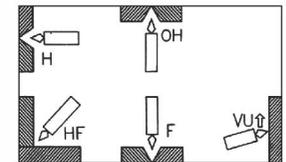
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	80~140	110~210	160~230

Precautions:

- Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- Short arc operation is required for welding, and string bead is preferred.
- When the weldment is relatively thick, it shall be preheated until temperature reaches above 150 °C . Then, conduct slow cooling after welding.

Welding position





J606RH

Conform to GB/T 32533 E5916-G P
 AWS A5.5 E9016-G
 Equivalent to ISO 18275-B-E 59 16-N1M1 P



J607

Conform to GB/T 32533 E5915-3M2 P
 AWS A5.5 E9015-D1
 ISO 18275-B-E 59 15-3 M2 P

Instructions:J606RH is high-roughness welding rod covered with ultralow hydrogen potassium coating for 590MPa crack-free steel of pressure vessels and it can be used under AC and DC. It is characterized by good notch impact toughness and crack resistance and allows all-position welding.

Purpose:It is applied to welding of important structures, such as pressure vessels, bridges, downcomers of hydropower stations and marine engineering and it can be well matched with CF60 (62) steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≥1.00	≤0.80	≤0.025	≤0.025	0.60-1.20	0.10-0.40
Measured value	0.087	1.31	0.23	0.006	0.017	1.14	0.18

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥620	≥530	≥17	≥47
Measured value	590	610	21	76

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g
 (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

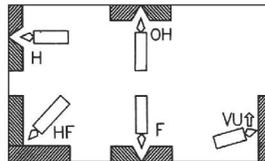
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at about 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Instructions:J607 is low-alloy high-strength welding rod covered with low-hydrogen sodium coating and it adopts DCRP.

Purpose:It is used for welding of medium-carbon steel and low-alloy steel of corresponding strength, such as 15MnVN.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.12	1.25-1.75	≤0.60	≤0.030	≤0.030	0.25-0.45
Measured value	0.059	1.38	0.47	0.006	0.014	0.35

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	≥620	≥530	≥17	≥27
Measured value	640	545	25	110

X-ray radiographic inspection requirements: Level I

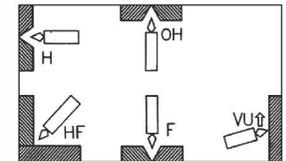
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~140	110~210	160~230

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.
4. When the weldment is relatively thick, it shall be preheated until temperature reaches above 150 °C. Then, conduct slow cooling after welding.

Welding position





J607RH

Conform to GB/T 32533 E5915-G P
 AWS A5.5 E9015-G
 Equivalent to ISO 18275-B-E 59 15-N1M1 P



J607Ni

Conform to GB/T 32533 E6215-G P
 AWS A5.5 E9015-G
 ISO 18275-B-E 62 15-G P

Instructions:J607RH is high-roughness welding rod covered with ultralow hydrogen sodium coating for 590MPa crack-free steel of pressure vessels and it adopts DCRP. It is characterized by good notch impact toughness and crack resistance and allows all-position welding.

Purpose:It is applied to welding of important structures, such as pressure vessels, bridges, downcomers of hydropower stations and marine engineering and it can be well matched with CF60 (62) steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≥1.00	≤0.80	≤0.025	≤0.025	0.60-1.20	0.10-0.40
Measured value	0.061	1.30	0.32	0.005	0.013	1.15	0.24

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥590	≥490	≥17	≥47
Measured value	650	550	26	120

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

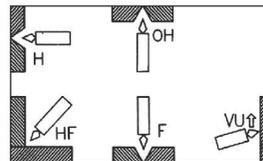
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at about 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Instructions:J607Ni is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating and it adopts DCRP. Its deposited metal is characterized by good notch impact toughness and crack resistance and allows all-position welding.

Purpose:It is applied to welding of structural steel of corresponding strength grade and has reheating cracking tendency, such as welding and repair welding of nuclear reactor shells, boiler drums, chemical containers and storage tanks.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≥1.00	≤0.80	≤0.030	≤0.030	1.20-1.50	0.10-0.40
Measured value	0.068	1.47	0.52	0.011	0.015	1.23	0.18

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥620	≥530	≥17	≥34
Measured value	660	570	26	80

X-ray radiographic inspection requirements: Level I

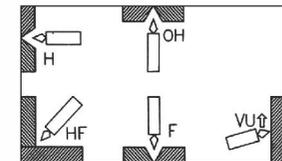
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use. Place it in a 100-150°C thermostat and take it out immediately before use.
2. The weldment must be cleaned of impurities such as oil stain, rust and water before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position





JQ·J607RHQG

Conform to GB/T 32533 E5915-G P
AWS A5.5 E9015-G
ISO 18275-B-E 62 15-G P

Instructions:JQ·J607RHQG is high-toughness welding rod covered with ultra-low hydrogen sodium coating, characterized by good welding performance, easy arc strike, soft arc, extremely low spatter, easy slag removal, and fine and beautiful weld ripples, and all-position welding is possible. The deposited metal is reliably purified and refined, and has good low temperature impact toughness and crack resistance. Its impact toughness is still high even at -60°C.

Purpose:It is used for welding of crack-free steel structures with tensile strength of 590MPa used by pressure vessels, for example: welding of the ethylene spherical tank structure

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≤0.80	≤0.50	≤0.015	≤0.020	2.00-2.70	0.10-0.30
Measured value	0.056	1.02	0.30	0.004	0.013	2.43	0.15

Mechanical properties of deposited metal (580°C × 2h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -60 C
Guarantee value	≥590	≥490	≥17	≥60
Measured value	630	535	25	120

Diffusible hydrogen content of the deposited metal: ≤4.0ml/100g (thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

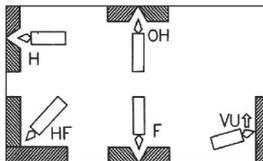
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. The welding rods must be baked at 400°C for 1.5h before welding, and then placed in a 100-150°C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



J707

Conform to GB/T 32533 E6915-G P
AWS A5.5 E10015-D2
Equivalent to ISO 18275-B-E 69 15-4 M2 P

Instructions:J707 is low-alloy high-strength steel welding rod covered with low hydrogen sodium coating. Adopt DCRP and all-position welding is possible. If necessary, the weldment shall be preheated before welding and tempered after welding.

Purpose:It is mainly used for welding of low-alloy steel structures of corresponding strength. 15MnMoV, 14MnMoVB, 18MnMoNb, etc., the post-weld structure can work under as-welded or tempering (550-650°C) condition.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.15	1.65-2.00	≤0.60	≤0.035	≤0.035	0.25-0.45
Measured value	0.074	1.83	0.30	0.005	0.018	0.37

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	≥690	≥600	≥16	≥27
Measured value	730	630	24	72

X-ray radiographic inspection requirements: Level I

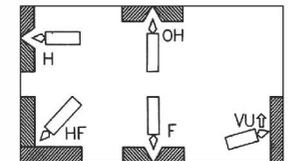
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~140	110~210	160~230

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position





J707Ni

Conform to GB/T 32533 E6915-G P
AWS A5.5 E10015-G
ISO 18275-B-E 69 15-G P

Instructions:J707Ni is low-alloy high-strength steel welding rod covered with low hydrogen sodium coating. Adopt DCRP and all-position welding is possible. Its deposited metal has good low temperature toughness and crack resistance.

Purpose:It is applied to welding of low-alloy high-strength steel structures of corresponding strength grade. Low-alloy high-strength steel such as 14MnMoVB, WEL-TEN70, and HW56 from Japan.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≥1.00	≤0.60	≤0.030	≤0.030	1.80-2.20	0.40-0.60
Measured value	0.052	1.22	0.13	0.005	0.012	2.10	0.46

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -50 C
Guarantee value	≥690	≥600	≥16	≥27
Measured value	730	625	22	68

X-ray radiographic inspection requirements: Level I

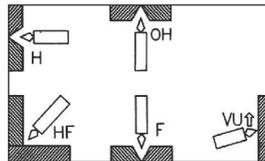
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~140	130~210	160~230

Precautions:

1. Welding rods must be baked at 350-400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position



J707RH

Conform to GB/T 32533 E6915-G P
AWS A5.5 E10015-G
ISO 18275-B-E 69 15-G P

Instructions:J707RH is ultra-low hydrogen high-toughness welding rod covered with low-hydrogen sodium coating. Adopt DCRP, and allposition welding is possible. Welding performance is good, and the deposited metal has good plasticity and toughness.

Purpose:It is used for welding of hull structures and also for welding of important high-strength steel structures with yield strength ≥590MPa.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	1.20-1.60	≤0.50	≤0.020	≤0.020	2.00-2.80	0.25-0.60
Measured value	0.053	1.45	0.19	0.005	0.011	2.47	0.36

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -50 C
Guarantee value	≥690	≥600	≥16	≥34
Measured value	740	650	23	80

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g
(thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

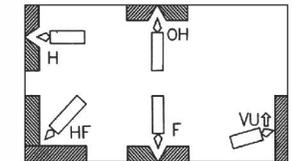
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

1. Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position





J757

Conform to GB/T 32533 E7615-G P
AWS A5.5 E11015-G
ISO 18275-B-E 76 15-G P

Instructions:J757 is low-alloy high-strength steel welding rod covered with low hydrogen sodium coating. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of low-alloy high-strength steel structures with tensile strength equivalent to about 740MPa.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.20	≥1.00	≤0.60	≤0.030	≤0.030	≤1.00

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥760	≥670	≥15	—

X-ray radiographic inspection requirements: Level I

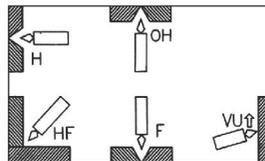
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~110	130~170	160~230

Precautions:

- 1.Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation and string bead are preferred for welding.

Welding position



J757Ni

Conform to GB/T 32533 E7615-G P
AWS A5.5 E11015-G
ISO 18275-B-E 76 15-G P

Instructions:J757Ni is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating. Its deposited metal has good comprehensive mechanical properties, especially that it has high low temperature impact toughness and excellent crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is mainly applied to welding of steel of corresponding strength grade, such as 14MnMoNbB and WEL-TEN80.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	Cr
Guarantee value	≤0.10	≥1.00	≤0.60	≤0.030	≤0.030	2.00-2.60	0.40-0.70	≤0.20
Measured value	0.052	1.53	0.17	0.006	0.012	2.10	0.48	0.030

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥760	≥670	≥15	≥27
Measured value	790	680	22	60

X-ray radiographic inspection requirements: Level I

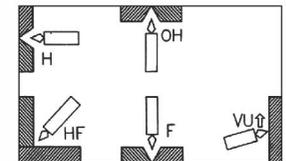
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	80~130	140~180	180~240

Precautions:

- 1.Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J807

Conform to GB/T 32533 E7615-G P
AWS A5.5 E11015-G
ISO 18275-B-E 76 15-G P

Instructions:J807 is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible. It has excellent process performance and crack resistance.

Purpose:It is mainly used for welding of 14MnMoNbB steel and lowalloy high-strength steel structures of corresponding strength grade.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.10	≥2.00	≤0.60	≤0.030	≤0.030	0.80-1.00
Measured value	0.080	1.80	0.35	0.008	0.018	0.90

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥760	≥670	≥15	≥27
Measured value	855	770	21	95

X-ray radiographic inspection requirements: Level I

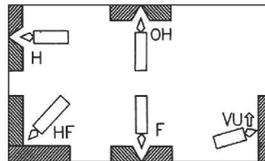
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~120	140~180	170~220

Precautions:

- 1.Welding rods must be baked at 400°C for 1h before welding and theyshall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation shall be adopted for welding and too wide weld joints shall be avoided. The weld joint equal to 2-3 times the diameter of welding rod is suitable.

Welding position



J807RH

Conform to GB/T 32533 E7815-G
AWS A5.5 E11015-G
Equivalent to ISO 18275-B-E 78 15-N4M2 A

Instructions:J807RH is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and allposition welding is possible. It has excellent welding performance and excellent plasticity and low temperature impact toughness.

Purpose:It is used for welding of important structures of low-alloy steel (ASTM A514 and A517, CF80) of corresponding strength grade, such as downcomers of hydropower stations, pressure vessels, bridges and marine engineering, which is good supporting welding rod for CF80 steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.10	≤1.00	≤0.80	≤0.020	≤0.025	2.00-2.80	0.20-0.50
Measured value	0.075	1.72	0.60	0.006	0.012	2.28	0.40

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	≥780	≥690	≥15	≥34
Measured value	830	735	19	85

Diffusible hydrogen content of the deposited metal: ≤5.0ml/100g
(thermal conductivity method or mercury method)

X-ray radiographic inspection requirements: Level I

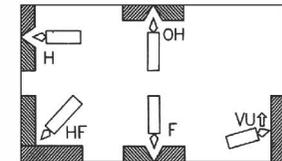
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

- 1.The welding rods must be baked at 400 °C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J857

Conform to GB/T 32533 E8315-G P
AWS A5.5 E12015-G
ISO 18275-B-E 83 15-G P

Instructions:J857 is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of low-alloy high-strength steel structures with tensile strength equivalent to about 830MPa.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.15	≥1.00	≤0.70	≤0.035	≤0.035	0.60-1.20
Measured value	0.084	2.30	0.44	0.005	0.018	0.68

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥830	≥740	≥14	—
Measured value	875	770	24	95

X-ray radiographic inspection requirements: Level I

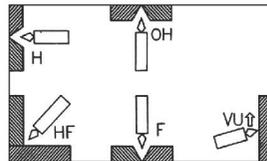
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	80~110	130~170	160~200

Precautions:

- 1.The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- 2.Remove rust and dirt from the weldment before welding and preheat it to about 200°C.
- 3.After welding, it can be tempered at 600-650 °C to eliminate internal stress.

Welding position



J857Cr

Conform to GB/T 32533 E8315-G P
AWS A5.5 E12015-G
ISO 18275-B-E 83 15-G P

Instructions:J857Cr is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of low-alloy high-strength steel pressure vessels with tensile strength equivalent to about 830MPa and other structures Such as 14CrMnMoVB, 30CrMo and 35CrMo steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	≤0.15	≥1.00	≤0.60	≤0.035	≤0.035	0.70-1.10	0.50-1.00
Measured value	0.078	1.70	0.32	0.005	0.015	1.00	0.92

Mechanical properties of deposited metal (620°C × 1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥830	≥740	≥14	—
Measured value	930	815	21	76

X-ray radiographic inspection requirements: Level I

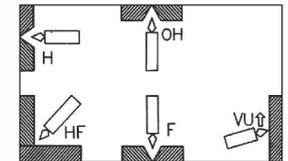
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	80~110	130~170	160~200

Precautions:

- 1.The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- 2.Remove rust and dirt from the weldment before welding and preheat it to about 200°C.
- 3.After welding, it can be tempered at 600-650 °C to eliminate internal stress.

Welding position





J857CrNi

Conform to GB/T 32533 E8315-G
AWS E12015-G
ISO 18275-B-E 83 15-G A

Instructions: J857CrNi is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating and allows all-position welding. It has excellent welding performance and excellent low temperature toughness and crack resistance. Adopt DCRP.

Purpose: It is mainly used for repair welding of defects of train couplers made of Grade E steel, as well as welding of low-alloy steel structures with tensile strength equivalent to about 830MPa, such as WEL-TEN80 and WEL-TEN80C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	V
Guarantee value	≤0.10	1.30-2.25	≤0.60	≤0.030	≤0.030	0.30-1.50	1.75-2.50	0.30-0.55	≤0.05
Measured value	0.076	1.70	0.45	0.005	0.015	0.50	2.46	0.36	0.015

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -50°C
Guarantee value	≥830	≥740	≥14	≥27
Measured value	870	835	18	55

X-ray radiographic inspection requirements: Level I

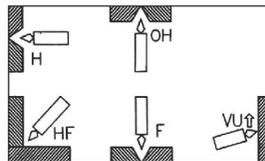
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. After welding, tempering at 620°C can be performed to eliminate internal stress.

Welding position



JQ·J857T

Conform to GB/T 32533 E8315-G P

Instructions: JQ·J857T is low-alloy high-strength steel welding rod covered with low hydrogen sodium coating. Adopt DCRP, and all position welding is possible. Welding performance is good. After deposited metal accepts quenching and tempering heat treatment after welding (the quenching and tempering heat treatment process adopts Grade E steel heat treatment method, namely immersion-type 900 °C quenching and tempering above 500 °C), excellent mechanical properties of high strength and high toughness can be obtained, completely satisfying requirements for mechanical properties of Grade E cast steel.

Purpose: It can be widely applied to repair welding of defects of components such as tow hooks and hooks of railway vehicles made of Grade E cast steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.08	1.30-2.00	≤0.50	≤0.030	≤0.035	2.00-4.00	≤1.00
Measured value	0.058	1.41	0.19	0.006	0.012	3.12	0.48

Mechanical properties of deposited metal (after quenching and tempering treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥830	≥740	≥14	≥27
Measured value	875	810	17	46

X-ray radiographic inspection requirements: Level I

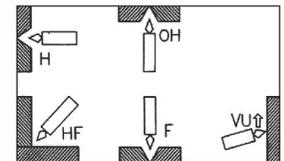
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The weldment is subject to quenching and tempering treatment after welding, namely, water quenching at 900°C and tempering at 550°C before air cooling.

Welding position





J907Cr

Conform to GB/T 32533 E8815-G P



J107

Conform to GB/T 32533 E9815-G P

Instructions:J907Cr is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and allpositionwelding is possible.

Purpose:It is used for welding of low-alloy high-strength steel pressure vessels with tensile strength equivalent to about 880MPa and other structures. Such as 14CrMnMoVB, 30CrMo and 35CrMo steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V
Guarantee value	≤0.15	≥1.00	≤0.80	≤0.035	≤0.035	0.70-1.10	0.50-1.00	0.05-0.15

Mechanical properties of deposited metal (620°C×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥880	≥780	≥12

X-ray radiographic inspection requirements: Level I

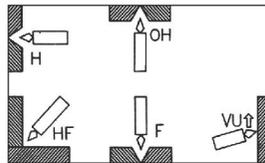
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	130~180	160~200

Precautions:

1. Welding rods must be baked at 400 °C for 1h before welding. It is recommended to keep them at 50-100°C, and take them out immediately before use, to reduce the hydrogen content of the weld metal, thus reducing the cracking tendency.
2. Remove rust and dirt from the weldment before welding and preheat it to about 200°C.
3. After welding, it can be tempered at 600-650 °C to eliminate internal stress.

Welding position



Instructions:J107 is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible.

Purpose:It is applicable to welding of low-alloy high-strength steel structures with tensile strength equivalent to about 980MPa.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.20	≥1.00	≤0.70	≤0.035	≤0.035	≥0.30
Measured value	0.085	2.77	0.37	0.011	0.017	0.74

Mechanical properties of deposited metal (620°C×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥980	≥880	≥12	—
Measured value	1050	930	18	90

X-ray radiographic inspection requirements: Level I

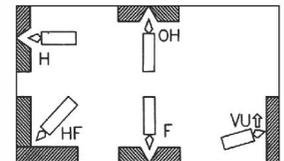
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~220

Precautions:

1. The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc and string bead are preferred for welding.
4. The weldment shall be preheated at 200-300 °C before welding and tempered at about 500°C after welding to eliminate internal stress.

Welding position





Instructions:J107Cr is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and allposition welding is possible.

Purpose:It is applicable to welding of low-alloy high-strength steel structures with tensile strength greater than 980MPa. Such as 30CrMnSi and 35CrMo.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	Ni
Guarantee value	≤0.15	≥1.00	≤0.70	≤0.035	≤0.035	1.50-2.20	0.40-0.80	1.00-2.00
Measured value	0.067	1.32	0.32	0.005	0.017	2.10	0.72	1.50

Mechanical properties of deposited metal (620°C×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥980	≥880	≥12	—
Measured value	1090	960	14	50

X-ray radiographic inspection requirements: Level I

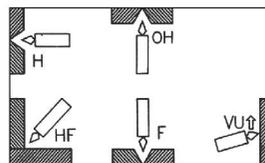
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~130	130~180	160~200

Precautions:

- The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150°C thermostat. They shall be taken out immediately before use.
- The weldment must be cleaned of rust and dirt, and preheated to about 300°C.
- After welding, the weldment shall be quenched and tempered, namely, oil quenching at 880°C and tempering at 520°C before air cooling to eliminate residual stress of the weldment and promote homogenization of the structure.

Welding position



Instructions:JQ·J107T is low-alloy high-strength steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and allposition welding is possible. After deposited metal accepts quenching and tempering heat treatment after welding (the quenching and tempering heat treatment process adopts Grade E steel heat treatment method, namely immersion-type 900°C quenching and tempering above 500°C), excellent mechanical properties of high strength and high toughness can be obtained, completely satisfying requirements for mechanical properties of Grade E cast steel.

Purpose:It can be widely applied to welding of tow hooks and hooks of vehicles and repair welding of Grade E cast steel and other structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.08	1.50-2.00	≤0.50	≤0.030	≤0.035	4.00-5.00	≤1.00
Measured value	0.048	1.57	0.15	0.005	0.013	4.20	0.50

Mechanical properties of deposited metal (after quenching and tempering treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥880	≥780	≥12	≥20
Measured value	940	810	18	35

X-ray radiographic inspection requirements: Level I

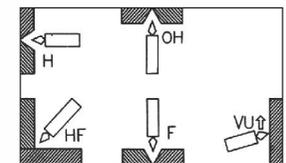
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

- The welding rods must be baked at 400°C for 1h before welding, and then placed in a 100-150°C thermostat. They shall be taken out immediately before use.
- The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- The weldment is subject to quenching and tempering treatment after welding, namely, water quenching at 900°C and tempering at 550°C before air cooling.

Welding position





Instructions:JQ.J36G welding rod is of high-toughness type covered with low-hydrogen sodium coating, which enjoys good welding performance and allows all-position welding. The deposited metal is reliably purified and refined, and has good flow accelerated corrosion (FAC) resistance, as well as relatively high impact toughness.

Purpose:It can be widely applied to welding of WB36 and WB36CN1 steel used in nuclear power and thermal power fields.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo
Guarantee value	≤0.12	1.00-1.50	≤0.50	≤0.015	≤0.020	1.50-0.30	0.60-1.30	0.20-0.45
Measured value	0.058	1.36	0.22	0.005	0.010	0.24	0.94	0.40

Mechanical properties of deposited metal (570°C±10°C×2h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥620	≥530	≥17	≥60
Measured value	700	630	22	95

X-ray radiographic inspection requirements: Level I

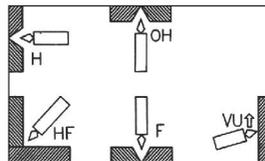
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

- 1.The welding rods must be baked at 350-400°C for 1.5h before welding, and then placed in a 100-150 °C thermostat. They shall be taken out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Instructions:JQ.J427NP is carbon steel welding rod covered with low hydrogen sodium coating used in nuclear power field. It is characterized by good welding performance, stable and soft arc, low spatter, easy slag removal and beautiful weld joint appearance. Its deposited metal has excellent plasticity, low temperature toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	≤0.10	≤1.25	≤0.55	≤0.018	≤0.025	≤0.30	≤0.20	≤0.30	≤0.04	≤0.25
Measured value	0.064	0.83	0.42	0.006	0.015	0.008	0.040	0.006	0.006	0.010

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	420-600	≥330	≥22	≥27
Measured value	545	455	30	180

X-ray radiographic inspection requirements: Level I

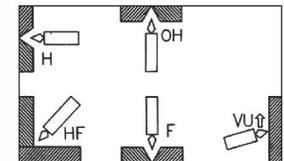
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	80~120	130~180	170~220

Precautions:

- 1.The welding rods must be baked at about 350-400°C for 1h before welding. In addition, place them in a thermostat at 100-150°C and take them out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc and string bead are preferred for welding.

Welding position





JQ·J507NP

Conform to GB/T 5117 E5015
AWS A5.1 E7015
NB/T 20009.1 E5015

Instructions:JQ·J507NP is carbon steel welding rod covered with low hydrogen sodium coating used in nuclear power field. It is characterized by good welding performance, stable and soft arc, low spatter, easy slag removal and beautiful weld joint appearance. Its deposited metal has excellent plasticity, low temperature toughness and crack resistance. Adopt DGRP and all-position welding is possible.

Purpose:It is used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	≤0.10	≤1.40	≤0.90	≤0.025	≤0.025	≤0.30	≤0.20	≤0.30	≤0.04	≤0.25
Measured value	0.058	1.03	0.42	0.007	0.016	0.007	0.038	0.005	0.007	0.015

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	490-640	≥400	≥22	≥27
Measured value	560	470	30	190

X-ray radiographic inspection requirements: Level I

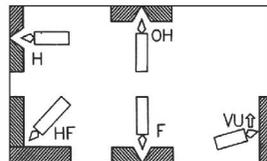
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	80~120	130~180	170~220

Precautions:

- 1.The welding rods must be baked at about 350-400°C for 1h before welding. In addition, place them in a thermostat at 100-150°C and take them out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc and string bead are preferred for welding.

Welding position



J427HIC

Conform to GB/T 5117 E4315
NB/T 47018.2

Instructions:J427HIC is carbon steel welding rod covered with lowhydrogen sodium coating, which is characterized by excellent welding process, stable arc, low spatter and beautiful appearance. Considering S and P content in the deposited metal is low, it has good plasticity, excellent low temperature impact toughness, excellent HIC and SSC resistance, as well as good operation adaptability.

Purpose:It is mainly used together with Q245R (HIC) steel plates, for welding of crude oil distillation, coking and cracking equipment such as pre-distillation towers, flashing towers, atmospheric towers, vacuum towers, diversion towers, stabilization towers and stripping towers.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.12	≤1.00	≤1.20	≤0.008	≤0.010	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.085	0.39	0.83	0.005	0.007	0.020	0.010	0.010	0.002

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C	Thermal treatment
Guarantee value	≥430	≥330	≥22	≥54	—
Measured value	540	445	27	140	As-welded
	500	390	29.5	165	620°C×2h

X-ray radiographic inspection requirements: Level I

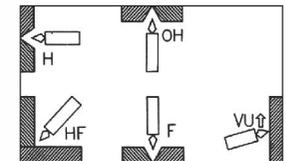
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	90~130	140~180	170~220

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J507HIC

Conform to GB/T 5117 E5015
AWS A5.1 E7015
NB/T 47018.2



Instructions:J507HIC is carbon steel welding rod covered with lowhydrogen sodium coating, which is characterized by excellent welding process, stable arc, low spatter and beautiful appearance. Considering S and P content in the deposited metal is low, it has good plasticity, excellent low temperature impact toughness, excellent HIC and SSC resistance, as well as good operation adaptability.

Purpose:It is mainly used together with Q345R (HIC) steel plates, for welding of crude oil distillation, coking and cracking equipment such as pre-distillation towers, flashing towers, atmospheric towers, vacuum towers, diversion towers, stabilization towers and stripping towers.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.12	≤1.25	≤0.90	≤0.008	≤0.010	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.080	1.00	0.45	0.005	0.007	0.020	0.020	0.010	0.010

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C	Thermal treatment
Guarantee value	≥490	≥400	≥20	≥54	—
Measured value	578	500	28	145	As-welded
	542	445	29.5	155	620°C×2h

X-ray radiographic inspection requirements: Level I

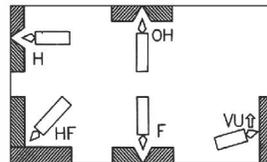
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~100	90~130	140~180	170~220

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



Concise table of weathering resistant steel and other low-alloy corrosion resistant steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
76	*J422CrCu	E4303-G	Titanium-calcium type	AC-DC	It is used for welding of weathering resistant steel, such as 12MnCrCu
77	J427CrCu	E4315-G	Low hydrogen type	DCRP	It is used for welding of weathering resistant steel, such as 12MnCrCu
78	J502NiCu	E5003-G	Titanium-calcium type	AC-DC	Welding of railway weathering resistant vehicles, such as 09MnCuPtTi and 10MnCu
79	J502WCU	E5003-G	Titanium-calcium type	AC-DC	Welding of railway weathering resistant vehicles, such as 09MnCuPtTi and 10MnCu
80	J506NiCu	E5016-G	Low hydrogen type	AC-DC	It is applicable to welding of vehicles, offshore engineering structures and bridges.
81	J506NiCrCu	E5016-G	Low hydrogen type	AC-DC	It is applicable to welding of structures resistant to atmospheric corrosion and offshore engineering.
82	J506WCU	E5016-G	Low hydrogen type	AC-DC	Welding of railway weathering resistant vehicles, such as 09MnCuPtTi and 10MnCu.
83	J507NiCu	E5015-G	Low hydrogen type	DCRP	Welding of railway weathering resistant vehicles, offshore engineering and bridges.
84	J556NiCrCu	E5516-G	Low hydrogen type	AC-DC	It is applicable to welding of structures resistant to atmospheric corrosion and offshore engineering.
85	J656NiCrL	E6216-G	Low hydrogen type	AC-DC	It is applicable to welding of high corrosion and weathering resistant steel with the tensile strength of 650MPa, such as S4503H.
86	JQ-J507NHV	E5015-G	Low hydrogen type	DCRP	It is used for welding of weathering resistant bridge steel structures of Q235, (D, E) MY, Q245, (D, E) MY, Q420, (D, E) MY and Q500, (D, E) MY grades in marine atmospheric corrosion environment.

*J422CrCu belongs to carbon steel welding rod, which is classified into the weathering resistant steel welding rod.



J422CrCu

Conform to GB/T 5117 E4303-G

Instructions:J422CrCu is weathering resistant steel welding rod covered with titanium-calcium coating. It can be used under AC and DC and allposition welding is possible. It owns excellent welding performance and good mechanical properties; The arc is stable and restarting a weld is easy; the deposited metal has good atmospheric corrosion resistance.

Purpose:It is specially used for welding of weathering resistant steel, such as 12MnCrCu.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Cu
Guarantee value	—	0.30-0.90	≤0.40	≤0.030	≤0.035	0.30-0.80	0.20-0.50
Measured value	0.067	0.45	0.20	0.015	0.020	0.50	0.35

Mechanical properties of deposited metal (as-welded)

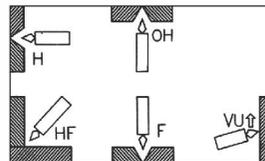
Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥420	≥330	≥22	≥27
Measured value	520	430	25	90

X-ray radiographic inspection requirements: Level II

Reference current (AC.DC)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~100	80~130	140~200	180~240

Welding position



J427CrCu

Conform to GB/T 5117 E4315-G

Instructions:J427CrCu is weathering resistant steel welding rod covered with low-hydrogen coating, which adopts DCRP and all-position welding is possible. In addition, its deposited metal has excellent atmospheric corrosion resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of weathering resistant steel, such as 12MnCrCu.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Cu
Guarantee value	≤0.12	0.30-0.70	≤0.35	≤0.035	≤0.040	0.30-0.80	0.20-0.50
Measured value	0.063	0.65	0.30	0.006	0.015	0.60	0.30

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥420	≥330	≥22	≥27
Measured value	565	480	27	153

X-ray radiographic inspection requirements: Level I

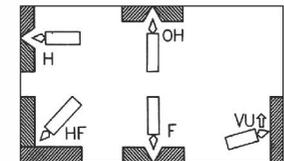
Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	130~180	170~240

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





J502NiCu

Conform to TB/T 2374 E5003-G

Instructions:J502NiCu is low-alloy weathering resistant steel welding rod covered with titanium-calcium coating. It can be used under AC and DC and all-position welding is possible. It is characterized by excellent welding performance and mechanical properties, stable arc, low spatter and easy slag removal; The weld joint appearance is beautiful and deposited metal has good atmospheric corrosion resistance.

Purpose:It is mainly used for welding of weathering resistant railway rolling stock, such as 09MnCrPTi.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cu
Guarantee value	≤0.12	0.30-0.90	≤0.40	≤0.030	≤0.035	0.20-0.50	0.20-0.50
Measured value	0.095	0.58	0.18	0.012	0.026	0.45	0.42

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥390	≥22	≥27
Measured value	540	450	27	73

X-ray radiographic inspection requirements: Level II

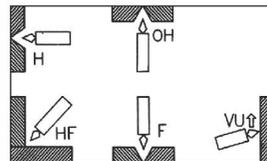
Reference current (AC,DC)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~90	80~130	140~200	180~240

Precautions:

The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



J502WCu

Conform to TB/T 2374 E5003-G

Instructions:J502WCu is low-alloy weathering resistant steel welding rod covered with titanium-calcium coating. It can be used under AC and DC and all-position welding is possible. It is characterized by excellent welding performance and mechanical properties, stable arc, low spatter and easy slag removal; The weld joint appearance is beautiful and deposited metal has good atmospheric corrosion resistance.

Purpose:This model of welding rods is exclusive for weathering resistant steel, and is specially used for welding of weathering resistant railway rolling stock, such as welding of 09MnCuPTi steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	W	Cu
Guarantee value	≤0.12	0.30-0.90	≤0.40	≤0.030	≤0.040	0.20-0.50	0.20-0.50
Measured value	0.092	0.78	0.24	0.015	0.025	0.36	0.30

Mechanical properties of deposited metal (as-welded)

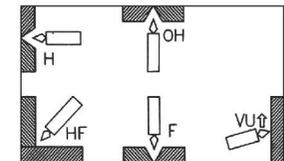
Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥390	≥22	≥27
Measured value	560	460	27	50

X-ray radiographic inspection requirements: Level II

Reference current (AC,DC)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	140~200	180~240

Welding position





J506NiCu

Conform to TB/T 2374 E5016-G

Instructions:J506NiCu is weathering resistant steel welding rod covered with low-hydrogen potassium coating. It can be used under AC and DC and all-position welding is possible. The deposited metal has excellent atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of carbon steel, and weathering resistant steel structures with tensile strength of 490MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cu
Guarantee value	≤0.12	0.30-0.90	≤0.70	≤0.030	≤0.035	0.20-0.50	0.20-0.50
Measured value	0.060	0.82	0.19	0.008	0.016	0.35	0.30

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥390	≥22	≥27
Measured value	530	450	27	166

X-ray radiographic inspection requirements: Level I

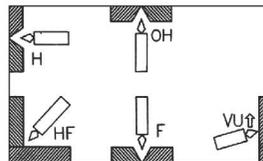
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~90	80~130	140~190	170~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



J506NiCrCu

Conform to TB/T 2374 E5016-G

Instructions:J506NiCrCu is weathering resistant steel welding rod covered with low-hydrogen potassium coating. It can be used under AC and DC and all-position welding is possible. The deposited metal has excellent atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of carbon steel, and weathering resistant steel structures with tensile strength of 490MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.10	≤1.25	≤0.60	≤0.020	≤0.025	0.20-0.50	0.30-0.80	0.20-0.40

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥500	≥400	≥22	≥60

X-ray radiographic inspection requirements: Level I

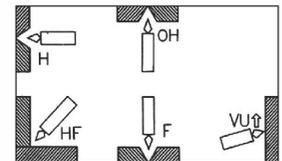
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~90	80~130	140~190	170~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J506WCu

Conform to TB/T 2374 E5016-G

Instructions:J506WCu is low-alloy weathering resistant steel welding rod covered with low-hydrogen potassium coating. It can be used under AC and DC and all-position welding is possible. The deposited metal has good atmospheric corrosion resistance, mechanical properties and crack resistance.

Purpose:It is applicable to welding of carbon steel, and weathering resistant steel structures with tensile strength of 490MPa, such as 09MnCuPTi; it can also be used for welding of other low-alloy steel structures, such as 16Mn.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	W	Cu
Guarantee value	≤0.12	0.30-0.90	≤0.70	≤0.030	≤0.035	0.20-0.50	0.20-0.50
Measured value	0.066	0.84	0.21	0.007	0.016	0.30	0.36

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥390	≥22	≥27
Measured value	545	440	29	120

X-ray radiographic inspection requirements: Level I

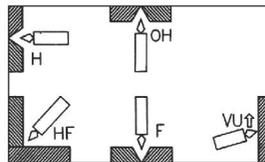
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~130	150~190	180~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



J507NiCu

Conform to TB/T 2374 E5015-G

Instructions:J507NiCu is weathering resistant steel welding rod covered with low-hydrogen sodium coating. Adopt DCRP and all-position welding is possible. The deposited metal has excellent atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of carbon steel, and weathering resistant steel structures with tensile strength of 490MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cu
Guarantee value	≤0.12	0.30-0.90	≤0.70	≤0.030	≤0.035	0.20-0.50	0.20-0.50

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥390	≥22	≥27

X-ray radiographic inspection requirements: Level I

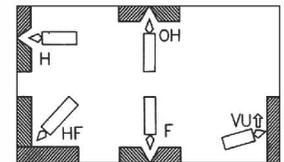
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~90	80~130	110~190	160~230

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





J556NiCrCu

Conform to TB/T2374 E5516-G

Instructions:J556NiCrCu is weathering resistant steel welding rod covered with low-hydrogen sodium coating. It can be used under AC and DC and all-position welding is possible. The deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of weathering resistant steel structures with tensile strength of 550MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.10	≤1.60	≤0.60	≤0.020	≤0.025	0.20-0.60	0.30-0.90	0.20-0.40
Measured value	0.065	0.95	0.35	0.010	0.013	0.52	0.44	0.25

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥550	≥450	≥22	≥60
Measured value	620	550	25	130

X-ray radiographic inspection requirements: Level I

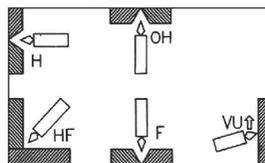
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~140	150~190	180~220

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The weldment must be cleaned of rust, oil stain, water, etc. before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



J656NiCrL

Conform to GB/T 32533 E6216-G

Instructions:J656NiCrL is high corrosion and weathering resistant steel welding rod covered with low-hydrogen potassium coating, which allows all-position welding. Its deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness. In addition, it can be used under AC and DC.

Purpose:It is applicable to welding of high corrosion and weathering resistant steel with the tensile strength of 650MPa, such as S450EW.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.05	≤1.20	≤0.60	≤0.010	≤0.020	1.00-2.00	3.00-5.00	≤0.40
Measured value	0.024	0.42	0.19	0.007	0.017	1.16	3.20	0.26

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥620	≥530	≥17	≥34
Measured value	665	585	21.5	120

X-ray radiographic inspection requirements: Level I

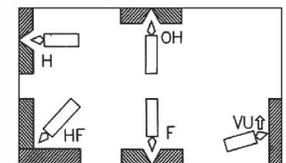
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~140	150~190	180~220

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position





Instructions:JQ•J507NHY is low-alloy steel welding rod covered with low hydrogen sodium coating. Adopt DCRP and all-position welding is possible. It is characterized by excellent welding performance, stable arc and easy slag removal. In addition to ensuring certain strength, the deposited metal has excellent low temperature toughness and excellent seawater corrosion resistance, satisfying the requirement that the weathering resistant alloy index $V>1.6$.

Purpose:It is used for welding of weathering resistant bridge steel structures of Q235q (D, E) NHY, Q345q (D, E) NHY, Q420q (D, E) NHY and Q500q (D, E) NHY grades in marine atmospheric corrosion environment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Mo	Cu
Guarantee value	≤ 0.08	≤ 1.00	≤ 0.60	≤ 0.015	≤ 0.020	3.00-3.75	proper amount	0.30-0.60
Measured value	0.043	0.50	0.18	0.005	0.009	3.21	—	0.42

Mechanical properties of deposited metal (as-welded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥ 490	≥ 400	≥ 22	≥ 60
Measured value	590	495	28	155

X-ray radiographic inspection requirements: Level I

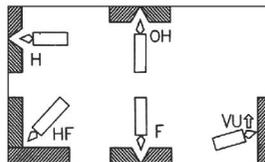
Reference current (DC⁺)

Welding rod diameter (mm)	$\Phi 3.2$	$\Phi 4.0$	$\Phi 5.0$
Welding current (A)	80~120	130~180	170~220

Precautions:

1. Welding rods must be baked at 350-400°C for 1h before welding and they shall be baked immediately before use. Place it in a 100-150°C thermostat and take it out immediately before use.
2. The weldment must be cleaned of impurities such as oil stain, rust and water before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position



Instructions on heat resistant steel welding rods

Heat resistant steel has chemical stability and sufficient strength under high temperature, as well as gas corrosion resistance. According to chemical composition and microstructure, heat resistant steel can be classified into pearlitic steel, martensitic steel, ferritic steel and austenitic steel.

This part mainly introduces the method for selecting different types of welding rods for welding of pearlitic heat resistant steel and martensitic heat resistant steel.

1. Welding of martensitic heat resistant steel

Martensitic heat resistant steel is divided into 5-9% chromium-containing medium-chromium steel and 12% chromium-containing highchromium steel, which has high hardening tendency. Considering it is easy to obtain high-hardness martensite and bainite after welding, which increases brittleness, together with relatively large residual stress, it is easy to generate cold cracking traces. Therefore, preheating and interlayer insulation must be carried out before welding, and high-temperature tempering shall be carried out immediately after welding.

2. Welding of pearlitic heat resistant steel

Pearlitic heat resistant steel welding rods do not contain Ni, but contain little Cr, and other alloying elements such as Mo, V, Nb and W. Due to the combined action of carbon and alloying elements in the steel, the hardened structure is easily formed during welding, and weldability is poor, so preheating before welding and tempering after welding is necessary.

For dissimilar steel welding, the welding material corresponding to the intermediate component is generally selected. For example, when Cr2.25Mo steel and Cr-Mo steel are to be welded together, R317 or R307 welding rod will be selected. At the same time, the preheating temperature and post-weld tempering treatment suitable for the steel with poor weldability shall be conducted.

For welding just using one kind of welding material or of thick walled pipe, alkaline heat resistant steel welding rods shall be selected, because their crack resistance is better than that of acid heat resistant steel welding rods.



Minimum preheating temperatures required for different chrome-molybdenumsteels

	Carbon steel	C-Mo	1/2Cr-1/2Mo	1Cr-1/2Mo	1 1/2Cr-1/2Mo	2Cr-1/2Mo	2 1/4Cr-1Mo	5Cr-1/2Mo	7Cr-1/2Mo	9Cr-1Mo	18-8
Carbon steel	—	B	C	C	C	C	C	D	D	D	A
C-Mo	B	B	C	C	C	C	C	D	D	D	A
1/2Cr-1/2Mo	C	C	C	C	C	C	C	D	D	D	E
1Cr-1/2Mo	C	C	C	C	C	C	C	D	D	D	E
1 1/2Cr-1/2Mo	C	C	C	C	C	C	C	D	D	D	E
2Cr-1/2Mo	C	C	C	C	C	C	C	D	D	D	E
2 1/4Cr-1Mo	C	C	C	C	C	C	C	D	D	D	E
5Cr-1/2Mo	D	D	D	D	D	D	D	D	D	D	E
7Cr-1/2Mo	D	D	D	D	D	D	D	D	D	D	E
9Cr-1Mo	D	D	D	D	D	D	D	D	D	D	E
18-8	A	A	E	E	E	E	E	E	E	E	—

- A—Without preheating, when the ambient temperature is lower than 20°C, it shall be preheated to 40°C.
- B—Preheating at 100-200°C; if wall thickness is less than 10mm and carbon content is less than 0.2%, lower preheating temperature to 40°C.
- C—Preheating at 150-300°C; when wall thickness is less than 19mm, preheating at 100°C is enough.
- D—Preheating at 200-350°C; when wall thickness is less than 19mm, preheating at 150°C is enough.
- E—Preheat at least at 100-250°C on one side of the chrome-molybdenum steel.



Heat treatment specification for welded joints of different chrome-molybdenum steels

	Carbon steel	C-Mo	1/2Cr-1/2Mo	1Cr-1/2Mo	1 1/2Cr-1/2Mo	2Cr-1/2Mo	2 1/4Cr-1Mo	5Cr-1/2Mo	7Cr-1/2Mo	9Cr-1Mo	18-8
Carbon steel	—	B	C	C	D	D	D	E	E	E	A
C-Mo	B	B	C	C	D	D	D	E	E	E	A
1/2Cr-1/2Mo	C	C	C	C	D	D	D	E	E	E	A
1Cr-1/2Mo	C	C	C	C	D	D	D	E	E	E	A
1 1/2Cr-1/2Mo	D	D	D	D	D	D	D	E	E	E	A
2Cr-1/2Mo	D	D	D	D	D	D	D	E	E	E	A
2 1/4Cr-1Mo	D	D	D	D	D	D	D	E	E	E	A
5Cr-1/2Mo	E	E	E	E	E	E	E	E	E	E	F
7Cr-1/2Mo	E	E	E	E	E	E	E	E	E	E	F
9Cr-1Mo	E	E	E	E	E	E	E	E	E	E	F
18-8	A	A	A	A	A	A	A	F	F	F	—

- A—Generally, post-weld heat treatment is not required.
- B—When carbon content exceeds 0.2% and wall thickness is greater than 12mm, heat treatment is required: 620-680°C, heat preservation for 1h per 25mm of wall thickness.
- C—When wall thickness is greater than 50mm or pipe diameter is greater than 102mm (the pipe wall is greater than 12 mm): 650-700°C, heat preservation for 1h/every 25mm
- D—When wall thickness is greater than 50mm or pipe diameter is greater than 102mm (the pipe wall is greater than 12 mm): 690-730°C, heat preservation for 1h/every 25mm
- E—Heating temperature: 700-750°C, heat preservation for 1h/every 25mm, preheating temperature must be maintained until heat treatment starts.
- F—When wall thickness is greater than 12mm, heating at 700-750°C and heat preservation for 1h/every 25mm.

Concise table of heat resistant steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
87	R106Fe	E5018-1M3	Low hydrogen type	AC-DC	It is used for high efficiency welding of heat resistant steel containing 0.5% of Mo with working temperature below 510 °C , or general low alloy steel.
88	R107	E5015-1M3	Low hydrogen type	DCRP	It is used for welding of heat resistant steel containing 0.5% of Mo with working temperature below 510°C, or general low-alloy steel.
89	R202	E5503-CM	Titanium-calcium type	AC-DC	It is used for welding of fire pearlitic heat resistant steel (such as 12CrMo) with working temperature below 510°C and other structures
90	R207	E5515-CM	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel containing Cr0.5%-Mo0.5% with working temperature below 510 °C , such as 12CrMo
91	R306Fe	E5518-1CM	Low hydrogen type	DCRP	It is used for high-efficiency welding of pearlitic heat resistant steel containing Cr1-Mo0.5% with working temperature below 520°C, such as 15CrMo
92	R307	E5515-1CM	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel containing Cr1-Mo0.5% with working temperature below 520°C, such as 15CrMo
93	R307BL	E5515-1CM	Low hydrogen type	DCRP	Support 14CrMoR, ASME SA387 Gr. 11 Class2 steel plates and it is used for welding of pressure-bearing equipment such as coke drums and gasifiers
94	R307BH	E5515-1CM	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel containing Cr0.5%-Mo0.5%-V with working temperature below 510 °C , such as 12CrMoV
95	R310	E5540-1CMV	Special type	AC-DC	It is used for welding of pearlitic heat resistant steel containing Cr0.5%-Mo0.5%-V with working temperature below 510 °C , such as 12CrMoV
96	R317	E5515-1CMV	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing CrMoVB with working temperature below 570 °C , such as 15CrMoV

Concise table of heat resistant steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
97	R327	E5515-1CMWV	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing CrMoVB with working temperature below 570°C, such as 15CrMoV
98	R337	E5515-1CMVnb	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing CrMoVB with working temperature below 620°C
99	R347	E5515-2CMWVB	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing Cr2.5%-Mo1% with working temperature below 560 °C , such as Cr2.5Mo
100	R407	E6215-2C1M	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing CrMoVB with working temperature below 620°C, such as 12Cr3MoSiTiB
101	R417	E5515-2CMVnb	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing Cr5%Mo resisting high-temperature hydrogen corrosion with working temperature of 400°C, such as Cr5Mo
102	R507	E5515-5CMV	Low hydrogen type	DCRP	It is used for welding of pearlitic heat resistant steel structures containing Cr5%Mo resisting high-temperature hydrogen corrosion with working temperature of 400°C, such as Cr5Mo
103	R507D	E5515-5CMV	Low hydrogen type	DCRP	It is used for backing welding of Cr5Mo type pearlitic heat resistant steel structures
104	R707	E6215-9C1M	Low hydrogen type	DCRP	It is used for welding of Cr9Mo heat resistant steel structures
105	R717	E6215-9C1MV	Low hydrogen type	DCRP	It is used for welding of Cr9MoNiV (such as T91) heat resistant steel structures and superheater pipes.



R106Fe

Conform to GB/T 5118 E5018-1M3

AWS A5.5 E7018-A1
ISO 3580-B-E4918-1M3

Instructions:R106Fe is pearlitic heat resistant steel welding rod containing 0.5% of Mo and covered with iron powder low-hydrogen coating, which allows all-position welding. It can be used under AC and DC. In addition, the weldment shall be subject to appropriate preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of boiler pipes (such as 15Mo) with working temperature below 510 °C , as well as welding of general lowalloy steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.12	≤1.00	≤0.80	≤0.030	≤0.030	0.40-0.65

Mechanical properties of deposited metal (605-645 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥490	≥390	≥22

X-ray radiographic inspection requirements: Level I

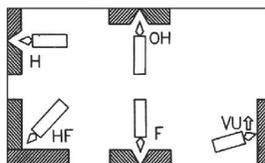
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~140	140~180	170~220

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R107

Conform to GB/T 5118 E5015-1M3

AWS A5.5 E7015-A1
ISO 3580-B-E4915-1M3

Instructions:R107 is pearlitic heat resistant steel welding rod containing 0.5% of Mo and covered with low-hydrogen coating, which adopts DCRP and all-position welding is possible. In addition, the weldment shall be subject to appropriate preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of boiler pipes (such as 15Mo) with working temperature below 510 °C , as well as welding of general lowalloy high-strength steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.12	≤1.00	≤0.80	≤0.030	≤0.030	0.40-0.65
Measured value	0.056	0.65	0.38	0.010	0.018	0.50

Mechanical properties of deposited metal (605-645 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥490	≥390	≥22
Measured value	570	480	28

X-ray radiographic inspection requirements: Level I

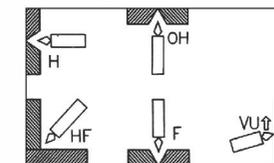
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R202

Conform to GB/T 5118 E5503-CM
Equivalent to ISO 3580-B-E5513-CM

Instructions:R202 is pearlitic heat resistant steel welding rod containing Cr 0.5%-Mo0.5% and covered with titanium-calcium coating. It has excellent welding performance and allows all-position welding. Meanwhile, slag removal is easy and it can be used under AC and DC.

Purpose:It is applied to welding of pearlitic heat resistant steel structures (such as 12CrMo) with working temperature below 510°C, steam pipes and superheater pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	0.05-0.12	≤0.90	≤0.80	≤0.030	≤0.030	0.40-0.65	0.40-0.65

Mechanical properties of deposited metal (605-645 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥540	≥440	≥14

X-ray radiographic inspection requirements: Level II

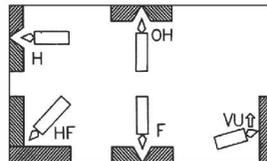
Reference current (AC,DC)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0
Welding current (A)	60~100	100~130	150~200

Precautions:

1. The weldment must be preheated according to structure characteristics before welding.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R207

Conform to GB/T 5118 E5515-CM
ISO 3580-B-E5515-CM

Instructions:R207 is pearlitic heat resistant steel welding rod containing Cr0.5%-Mo0.5% and covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible. In addition, the weldment shall be subject to appropriate preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of CrMo pearlitic heat resistant steel structures (such as 12CrMo) with working temperature below 510°C and chemical containers made of corresponding steel type under high temperature and high pressure.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	0.05-0.12	≤0.90	≤0.80	≤0.030	≤0.030	0.40-0.65	0.40-0.65
Measured value	0.075	0.80	0.23	0.005	0.017	0.58	0.50

Mechanical properties of deposited metal (605-645 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥17
Measured value	640	540	25

X-ray radiographic inspection requirements: Level I

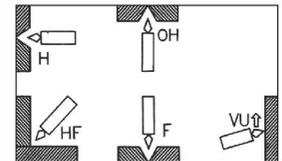
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R306Fe

Conform to GB/T 5118 E5518-1CM
 AWS A5.5 E8018-B2
 ISO 3580-B-E5518-1CM

Instructions:R306Fe is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5% and covered with iron powder low-hydrogen potassium coating. It can be used under AC and DC, short-arc operation is preferred and all-position welding is possible. In addition, the preheating and interlayer temperature of weldment is 160-250 °C during welding.

Purpose:It is used for welding of pearlitic heat resistant steel containing Cr1%-Mo0.5% (such as 15CrMo), such as, boiler heating surface pipes with working temperature below 550 °C and steam pipes and highpressure vessels with working temperature below 520 °C , as well as welding of 30CrMoSi steel castings.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	0.05-0.12	≤0.90	≤0.80	≤0.030	≤0.030	1.00-1.50	0.40-0.65
Measured value	0.065	0.65	0.40	0.007	0.017	1.15	0.54

Mechanical properties of deposited metal (605-645 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥17

X-ray radiographic inspection requirements: Level I

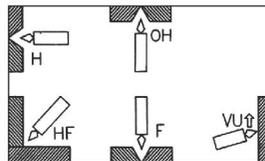
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	100~130	140~180	180~210

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R307

Conform to GB/T 5118 E5515-1CM
 AWS A5.5 E8015-B2
 ISO 3580-B-E5515-1CM

Instructions:R307 is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5% and covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible. In addition, the weldment shall be subject to appropriate preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of heat resistant steel containing Cr1%-Mo0.5% with working temperature below 520 °C , such as boiler pipes,high-pressure vessels and petroleum refining equipment, as well as welding of 30CrMoSi steel castings.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	0.05-0.12	≤0.90	≤0.80	≤0.030	≤0.030	1.00-1.50	0.40-0.65
Measured value	0.065	0.65	0.40	0.007	0.017	1.15	0.54

Mechanical properties of deposited metal (675-705 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥17
Measured value	610	520	25

X-ray radiographic inspection requirements: Level I

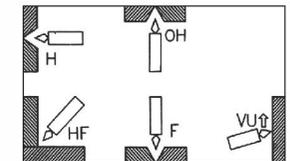
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2. 5	Φ 3. 2	Φ 4. 0	Φ 5. 0
Welding current (A)	60~90	90~120	130~180	160~210

Precautions:

- 1.Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R307BL

Conform to GB/T 5118 E5515-1CM
AWS A5.5 E8015-B2
NB/T 47018.2

Instructions:R307BL is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5% and covered with low-hydrogen sodium coating. It is characterized by excellent welding process, stable arc and beautiful appearance. The deposited metal has low content of S and P, with X coefficient $\leq 15\text{ppm}$, low temper embrittlement sensitivity, good plasticity, good low temperature impact toughness and high-temperature mechanical properties. Meanwhile, all-position welding is possible.

Purpose:Support 14CrMo1R, ASME SA387 Gr.11 Class2 steel plates and it is used for welding of pressure-bearing equipment such as coke drums and gasifiers

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	As	Sn	Sb	X coefficient
Guarantee value	0.05-0.12	≤ 0.90	≤ 0.80	≤ 0.010	≤ 0.010	1.00-1.50	0.40-0.65	≤ 0.010	≤ 0.010	≤ 0.005	$\leq 15\text{ppm}$
Measured value	0.07	0.75	0.25	0.005	0.006	1.35	0.50	0.0053	0.00062	0.0017	7.6

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C	Thermal treatment
Guarantee value	515~690	≥ 310	≥ 22	≥ 54	—
Measured value	560	472	29	180	690°C × 20h
	580	490	27	175	690°C × 6h

X-ray radiographic inspection requirements: Level I

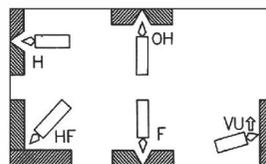
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	130~180	160~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The interpass temperature is recommended to be controlled between 150°C-180°C.

Welding position



R307BH

Conform to GB/T 5118 E5515-1CM
AWS A5.5 E8015-B2
NB/T 47018.2

Instructions:R307BH is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5% and covered with low-hydrogen sodium coating, which characterized by excellent welding process, stable arc and beautiful appearance and allows all-position welding. Its deposited metal has low content of S and P, with low temper embrittlement sensitivity, good plasticity, good low temperature impact toughness and hightemperature mechanical properties.

Purpose:Support 15CrMoR, ASME SA387 Gr.12 Class2 steel plates and it is used for welding of pressure-bearing equipment such as coke drums and gasifiers

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	≤ 0.12	≤ 0.90	≤ 0.60	≤ 0.010	≤ 0.012	0.80-1.15	0.40-0.65
Measured value	0.06	0.70	0.25	0.005	0.010	1.00	0.50

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C	Thermal treatment
Guarantee value	450~590	≥ 295	≥ 19	≥ 54	—
Measured value	510	405	27	180	690°C × 14h
	525	414	25	160	690°C × 6h

X-ray radiographic inspection requirements: Level I

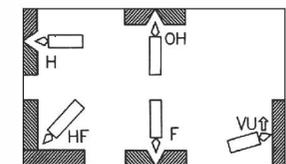
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	130~180	160~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The interpass temperature is recommended to be controlled between 150°C-180°C.

Welding position





R310

Conform to GB/T 5118 E5540-1CMV

Instructions:R310 is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5%-V and covered with special coating, which allows allposition welding. It can be used under AC and DC. It enjoys good resistance to pores and cold bending plasticity. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of pearlitic heat resistant steel (such as 12CrMoV) structures with working temperature below 540 °C , such as high-temperature high-pressure boiler pipes, petroleum cracking equipment and high-temperature synthetic chemical equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V
Guarantee value	0.05-0.12	≤0.90	≤0.60	≤0.030	≤0.030	0.80-1.50	0.40-0.65	0.10-0.35

Mechanical properties of deposited metal (715-745 °C × 2h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥14

X-ray radiographic inspection requirements: Level II

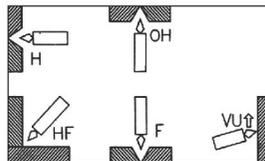
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	180~220

Precautions:

The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R317

Conform to GB/T 5118 E5515-1CMV
ISO 3580-B-E5515-G

Instructions:R317 is pearlitic heat resistant steel welding rod containing Cr1%-Mo0.5%-V and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of pearlitic heat resistant steel (such as 12CrMoV) structures with working temperature below 540 °C , such as high-temperature high-pressure boiler pipes, petroleum cracking equipment and high-temperature synthetic chemical equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V
Guarantee value	0.05-0.12	≤0.90	≤0.60	≤0.030	≤0.030	0.80-1.50	0.40-0.65	0.10-0.35
Measured value	0.062	0.63	0.42	0.007	0.018	1.20	0.50	0.18

Mechanical properties of deposited metal (715-745 °C × 2h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥15
Measured value	630	540	24

X-ray radiographic inspection requirements: Level I

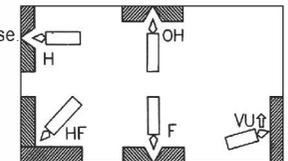
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R327

Conform to GB/T 5118 E5515-1CMWV
ISO 3580-B-E5515-G

Instructions:R327 is pearlitic heat resistant steel welding rod containing CrMoVW and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of pearlitic heat resistant steel with working temperature below 570 °C, such as 15CrMoV.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	W
Guarantee value	0.05-0.12	0.70-1.10	≤0.60	≤0.030	≤0.030	0.80-1.50	0.70-1.00	0.20-0.35	0.25-0.50

Mechanical properties of deposited metal (715-745 °C × 5h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥15

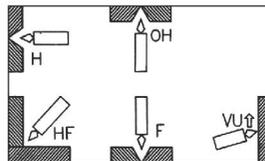
X-ray radiographic inspection requirements: Level I Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

- 1.Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R337

Conform to GB/T 5118 E5515-1CMVNB
ISO 3580-B-E5515-G

Instructions:R337 is pearlitic heat resistant steel welding rod containing CrMoVNB and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of pearlitic heat resistant steel with working temperature below 570 °C, such as 15CrMoV.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	Nb
Guarantee value	0.05-0.12	≤0.90	≤0.60	≤0.030	≤0.030	0.80-1.50	0.70-1.00	0.15-0.40	0.10-0.25

Mechanical properties of deposited metal (715-745 °C × 5h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥15

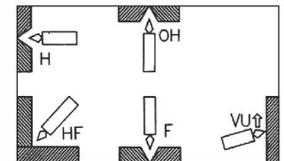
X-ray radiographic inspection requirements: Level I Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

- 1.Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R347

Conform to GB/T 5118 E5515-2CMWVB
ISO 3580-B-E5515-G

Instructions:R347 is pearlitic heat resistant steel welding rod containing CrMoVWB and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of corresponding pearlitic heat resistant steel structures with working temperature below 620 °C . Such as hightemperature high-pressure turbine generator sets and boiler pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	W	B
Guarantee value	0.05-0.12	≤1.00	≤0.60	≤0.030	≤0.030	1.50-2.50	0.30-0.80	0.20-0.60	0.20-0.60	0.001-0.003

Mechanical properties of deposited metal (715-745 °C × 2h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥15

X-ray radiographic inspection requirements: Level I

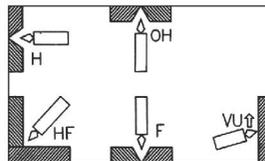
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

- 1.Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R407

Conform to GB/T 5118 E6215-2C1M
AWS A5.5 E9015-B3
ISO 3580-B-E6215-2C1M

Instructions:R407 is pearlitic heat resistant steel welding rod containing Cr2.5%-Mo1% and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of Cr2.5Mo-type pearlitic heat resistant steel structures. Such as high-temperature high-pressure pipes used at temperature below 550°C , synthetic chemical equipment and petroleum cracking equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo
Guarantee value	0.05-0.12	≤0.90	≤1.00	≤0.030	≤0.030	2.00-2.50	0.90-1.20
Measured value	0.064	0.67	0.38	0.006	0.016	2.15	1.00

Mechanical properties of deposited metal (675-705 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥620	≥530	≥15
Measured value	670	580	21

X-ray radiographic inspection requirements: Level I

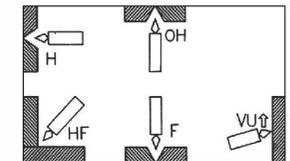
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

- 1.Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R417

Conform to GB/T 5118 E5515-2CMVNB
ISO 3580-B-E5515-G

Instructions:R417 is pearlitic heat resistant steel welding rod containing CrMoVNB₁ and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of 12Cr3MoVSiTiB-type pearlitic heat resistant steel structures with working temperature below 620°C, such as high-temperature high-pressure boiler pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	Nb
Guarantee value	0.05-0.12	≤1.00	≤0.60	≤0.030	≤0.030	2.40-3.00	0.70-1.00	0.25-0.50	0.35-0.65

Mechanical properties of deposited metal (715-745 °C × 4h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥15

Water content of the coating: ≤0.30%

X-ray radiographic inspection requirements: Level I

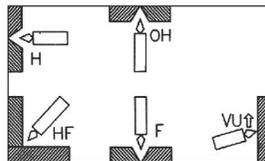
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



R507

Conform to GB/T 5118 E5515-5CMV

Instructions:R507 is pearlitic heat resistant steel welding rod containing Cr5%-Mo-V and covered with low-hydrogen sodium coating. It has high-temperature hydrogen corrosion resistance and adopts DCRP and short arc operation. All-position welding is possible. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of Cr5Mo-type pearlitic heat resistant steel structures, such as high-temperature hydrogen corrosion resistant pipes used at 400°C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	Cu
Guarantee value	≤0.12	0.50-0.90	≤0.50	≤0.030	≤0.030	4.50-6.00	0.40-0.70	0.10-0.35	≤0.50
Measured value	0.068	0.65	0.35	0.008	0.017	5.15	0.57	0.20	0.045

Mechanical properties of deposited metal (740-760 °C × 4h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥14
Measured value	620	530	21

X-ray radiographic inspection requirements: Level I

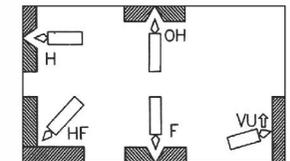
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at about 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R507D

Conform to GB/T 5118 E5515-5CMV



R707

Conform to GB/T 5118 E6215-9C1M

Instructions:R507D is backing welding rod of pearlitic heat resistant steel containing Cr5%-Mo-V and covered with low-hydrogen sodium coating, and owns high-temperature hydrogen corrosion resistance. The characteristics of the welding rod include: The arc has certain blowing force. When backing welding is performed, adopt single-side welding with back formation. In addition, arc is stable, slag removal is easy and the weld joint generated on the back side is beautiful. Select appropriate process to prevent defects such as pores and slag inclusion. Adopt DCRP and short arc operation, and all-position welding is possible. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for backing welding of Cr5Mo-type pearlitic heat resistant steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	V	Cu
Guarantee value	≤0.12	0.50-0.90	≤0.50	≤0.030	≤0.030	4.50-6.00	0.40-0.70	0.10-0.35	≤0.50

Mechanical properties of deposited metal (740-760 °C × 4h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥460	≥14

X-ray radiographic inspection requirements: Level I

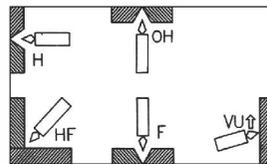
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2
Welding current (A)	90~130

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, without swing, and string bead is preferred.
4. Arc strike shall be carried out outside the groove and the arc shall be extinguished at another place after the molten bath is full.

Welding position



Instructions:R707 is heat resistant steel welding rod containing Cr9Mo and covered with low-hydrogen sodium coating, which adopts DCRP and all-position welding is possible. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of Cr9Mo heat resistant steel structures and superheater pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Mo	Ni
Guarantee value	0.05-0.10	≤1.00	≤0.90	≤0.030	≤0.030	8.00-10.50	0.85-1.20	≤0.40

Mechanical properties of deposited metal (725-755 °C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥630	≥530	≥15

X-ray radiographic inspection requirements: Level I

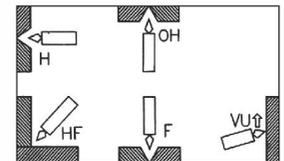
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at about 400°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





R717

Conform to GB/T 5118 E6215-9C1MV
AWS A5.5 E9015-B9
ISO 3580-B-E6215-9C1MV



Instructions:R717 is bainitic-martensitic heat resistant steel welding rod containing Cr9%-Mo1%-Ni0.8%-V and covered with low-hydrogen sodium coating and adopts DCRP and short arc operation. All-position welding is possible. The weldment shall be subject to proper preheating and post-weld heat treatment based on structure characteristics.

Purpose:It is used for welding of Cr9MoNiV (such as T91/P91) heat resistant steel structures and superheater pipes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni
Guarantee value	0.08-0.13	≤1.20	≤0.30	≤0.010	≤0.010	8.0-10.5	≤0.80
Test item	Mo	V	Nb	Cu	Al	N	
Guarantee value	0.85-1.20	0.15-0.30	0.02-0.10	≤0.25	≤0.040	0.020-0.070	

Mechanical properties of deposited metal (745-775 °C × 2h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥620	≥530	≥15

Diffusible hydrogen content of the deposited metal: ≤4.0ml/100g
(glycerol method)

X-ray radiographic inspection requirements: Level I

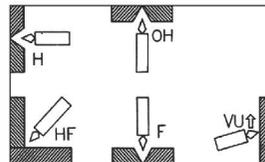
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	130~170	170~210

Precautions:

- 1.Welding rods must be baked at about 400°C for 1h before welding and they shall be baked immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Instructions on low-temperature steel welding rods

Low-temperature steel refers to the special steel for welding structures used at the working temperature of -40°C - -253°C. Low-temperature steel is generally graded according to different operating temperatures, including -40°C, -60°C, -70°C, -80°C, -90°C, -100°C, -196°C and -253°C.

Low-temperature steel is mainly used for production of energy, petroleum and chemical industrial products, storage and transportation of various types of liquefied gas and various pressure vessels and pipeline equipment used at low temperature. Therefore, this type of steel must have important characteristic of low temperature embrittlement resistance.

Selection of low-temperature steel welding rod:

1. In general, if the low-temperature steel is required to be used at above -45°C , high-toughness low-hydrogen welding rods can be selected.
2. Low temperature steel welding rods containing 2.5% of nickel shall be selected generally for low temperature steel which is required to be used at -60°C - -90°C.
3. While for low temperature steel which is required to be used at -100 °C - -196 °C , Generally low temperature steel welding rods containing 3.5% or more nickel (9% Ni) and containing a certain amount of molybdenum shall be selected.
4. For low temperature steel to be used at extremely low temperature (ultra-low temperature) of -196°C - -253°C, austenitic stainless steel welding rods shall be used.



W607

Conform to GB/T 5117 E5015-G P
 AWS A5.5 E7015-G
 ISO 2560-B-E 49 15-G P

Concise table of low temperature steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Welding current	Main purpose
114	W607	E5015-G P	Low hydrogen type	DCRP	It is used for welding of -60 °C low temperature steel structures, such as 13MnSi63, 09MnNiB and E36.
115	W707	E5015-G P	Low hydrogen type	DCRP	It is used for welding of -70 °C low temperature steel structures, such as 09Mn2V and 09MnTiCuRe.
116	W707Ni	E5515-N5 P	Low hydrogen type	DCRP	It is used for welding of -70 °C low temperature steel structures, such as 09Mn2V, 06MnAl and 3.5Ni.
117	W707NiL	E5015-N5 P	Low hydrogen type	DCRP	It is used for welding of ASME SA203 Gr. B, 09MnNiDR and other steel plates
118	W807	E5015-G P	Low hydrogen type	DCRP	It is used for welding of -80 °C low temperature steel structures, such as 1.5Ni steel
119	W907Ni	E5515-N7 P	Low hydrogen type	DCRP	It is used for welding of -90 °C low temperature steel structures, such as 3.5Ni steel
120	W107Ni	E5015-N7 P	Low hydrogen type	DCRP	It is used for welding of -100°C typical low temperature steel, such as 3.5Ni steel

Instructions:W607 is low temperature steel welding rod containing Ni and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The deposited metal still has good impact toughness at -60°C.

Purpose:Weld low temperature steel structures at -60 °C , such as 13MnSi63, 09MnNiNb and E36.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	0.50-1.20
Measured value	0.060	1.38	0.21	0.005	0.015	0.85

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -60°C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	550	460	29	100

X-ray radiographic inspection requirements: Level I

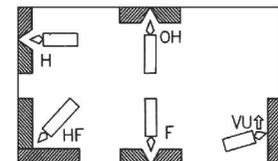
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~70	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





W707

Conform to GB/T 5117 E5015-G P
AWS A5.5 E7015-G



W707Ni

Conform to GB/T 5117 E5515-N5 P
Equivalent to AWS A5.5 E8015-C1
ISO 2560-B-E 55 15-N5 P

Instructions:W707 is low temperature steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP and allows all position welding. The deposited metal still has good impact toughness at -70°C.

Purpose:Weld low temperature steel structures used at -70 °C , such as 09Mn2V and 09MnTiCuRe.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cu	Ni
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.035	≤0.035	≤1.00	0.50-1.20
Measured value	0.060	1.00	0.27	0.006	0.015	0.62	0.62

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -70°C
Guarantee value	≥490	≥400	≥20	≥27
Measured value	570	480	29	80

X-ray radiographic inspection requirements: Level I

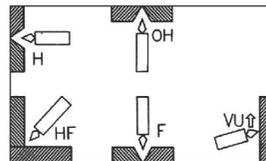
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~70	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. When welding, adopt small and medium specifications, multi-layer multi-pass welding as far as possible, and control inter-layer temperature below 200°C.

Welding position



Instructions:W707Ni is low temperature steel welding rod containing Ni and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The deposited metal still has good impact toughness at -70°C.

Purpose:Weld low temperature structures made of 09Mn2V, 06MnVAl and 3.5Ni steel used at -70°C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.12	≤1.25	≤0.60	≤0.030	≤0.030	2.00-2.75
Measured value	0.057	0.90	0.30	0.006	0.015	2.50

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -70°C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	610	520	28	90

X-ray radiographic inspection requirements: Level I

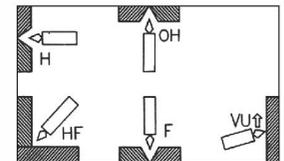
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~70	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation and string bead are preferred for welding.

Welding position





W707NiL

Conform to GB/T 5117 E5015-N5 P
AWS A5.5 E7015-C1L
NB/T 47018.2



W807

Conform to GB/T 5117 E5015-G
ISO 2560-B-E 49 15-G P

Instructions:W707NiL is low temperature steel welding rod covered with low-hydrogen sodium coating, which adopts DCRP, has good process performance and allows all-position welding. Its deposited metal has good toughness at -70°C.

Purpose:It is used for welding of ASME SA203 Gr.B, 09MnNiDR, etc.

Chemical composition of deposited metal (%)

Test item	C	Si	Mn	S	P	Ni
Guarantee value	≤0.05	≤1.25	≤0.50	≤0.015	≤0.025	$\frac{2.00}{2.75}$
Measured value	0.04	0.72	0.24	0.005	0.007	2.66

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -70°C
Guarantee value	490~610	≥390	≥22	≥54
Measured value	535	452	30.0	165

X-ray radiographic inspection requirements: Level I

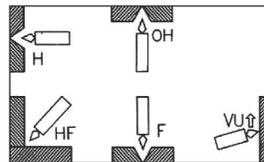
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350°C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water, etc. of the weldment shall be removed before welding.
3. Pay attention to controlling inter-pass temperature below 150°C.
4. Short arc operation is required for welding, and string bead is preferred.

Welding position



Instructions:W807 is low temperature steel welding rod containing Ni and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The deposited metal still has good impact toughness at -80°C.

Purpose:Weld 1.5Ni steel structures used at -80°C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.07	$\frac{1.10}{1.40}$	≤0.50	≤0.035	≤0.035	$\frac{1.20}{1.60}$

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -80°C
Guarantee value	≥490	≥400	≥20	≥27

Water content of the coating: ≤0.30%

X-ray radiographic inspection requirements: Level I

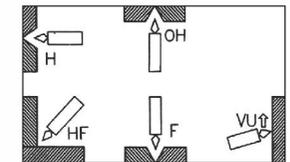
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~70	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. When welding, adopt small and medium specifications, multi-layer multi-pass welding as far as possible, and control inter-layer temperature below 200°C.
3. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





W907Ni

Conform to GB/T 5117 E5515-N7 P
 Equivalent to AWS A5.5 E8015-C2
 ISO 2560-B-E 55 15-N7 P

Instructions:W907Ni is low temperature steel welding rod containing Ni and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. The deposited metal still has good impact toughness at -90°C.

Purpose:Weld 3.5Ni low-alloy steel structures used at low temperature of -90°C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.12	≤1.25	≤0.80	≤0.035	≤0.035	3.00-3.75

Mechanical properties of deposited metal (620°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -90°C
Guarantee value	≥550	≥460	≥17	≥27

X-ray radiographic inspection requirements: Level I

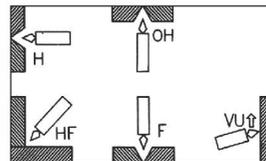
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~70	60~90	90~120	140~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. The weldment must be preheated at about 150 °C before welding to prevent cracking.
3. If stress elimination is necessary for the weldment, it can be tempered at 600-650°C after welding.

Welding position



W107Ni

Conform to GB/T 5117 E5015-N7 P
 Equivalent to AWS A5.5 E7015-G
 ISO 2560-B-E 49 15-N7 P

Instructions:W107Ni is low temperature steel welding rod containing Ni and covered with low-hydrogen sodium coating, which adopts DCRP and allows all-position welding. Since the weld joint contains about 3.5% of Ni, the deposited metal has good temper resistance.

Purpose:Weld 06AlNbCuN, 06MnNb and 3.5Ni steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.050	≤1.25	≤0.50	≤0.030	≤0.030	3.00-3.75
Measured value	0.040	0.60	0.15	0.003	0.012	3.52

Mechanical properties of deposited metal (quenching and tempering heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -100°C
Guarantee value	≥490	≥390	≥20	≥27
Measured value	520	400	30	90

X-ray radiographic inspection requirements: Level I

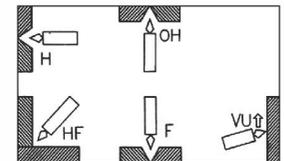
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~70	60~90	100~130	150~180	170~210

Precautions:

1. Welding rods must be baked at 350-400°C for 1.5h before welding and they shall be baked immediately before use.
2. When welding, adopt small and medium specifications, multi-layer multi-pass welding as far as possible, and control inter-layer temperature below 200°C.

Welding position





Instructions on stainless steel welding rods

(I) Instructions on chromium stainless steel

Chromium stainless steel has certain corrosion resistance (oxidizing acid, organic acid, cavitation), heat resistance and wear resistance. Generally, it is used as materials of power plant, chemical and petroleum equipment. Considering the chromium stainless steel has poor weldability, it is necessary to pay attention to heat treatment conditions of the welding process and selection of suitable welding rods.

1. Cr13 martensitic stainless steel: Because this type of chromium stainless steel has high hardenability after welding and is prone to cracking, when the same type of chromium stainless steel welding rods (G202, G207) are used for welding, they must be preheated at above 300 °C, and tempered and slowly cooled at about 700 °C after welding to improve plasticity and toughness of weld joints. If chromium-nickel stainless steel welding rods (such as A107, 207) are used for welding, heat treatment after welding is not necessary.

2. Cr17 ferritic stainless steel: This type of chromium stainless steel is added with proper amount of stable elements, such as titanium, tantalum and molybdenum in order to improve corrosion resistance and weldability, so its weldability is better than that of Cr13. When the same type of chromium stainless steel welding rods (G302, G307) are used for welding, they must be preheated at 100-200 °C, and tempered at about 800 °C after welding to improve plasticity of weld joints. If chromium-nickel stainless steel (such as A107, 207) is used for welding, heat treatment after welding is not necessary.

(II) Instructions on chromium-nickel austenitic stainless steel

Considering chromium-nickel austenitic stainless steel welding rods have good corrosion resistance and oxidation resistance, they are widely used in manufacturing of chemical, petroleum, fertilizer, food machinery, medical device and other equipment. In the case of welding of chromium-nickel stainless steel, repeated heating will make it precipitate carbides, which will weaken corrosion resistance and mechanical properties. Therefore, the welding rod shall be selected according to working conditions of equipment (working temperature and categories of medium).

Generally, the selected welding rods shall have the same or similar constituents as or to those of the base metal and selection is mainly based on medium and working temperature.

1. For the medium whose working temperature is higher than 300 °C and which has strong corrosion, it is required to select stainless steel welding rods containing stable elements, such as Ti or Nb or ultra-low carbon stainless steel welding rods; For the medium containing dilute sulfuric acid or hydrochloric acid, stainless steel welding rods containing Mo and Cu are often selected.

2. If working at normal temperature with weak corrosivity, stainless steel welding rods not containing Ti or Nb can be used.

3. Since carbon content of the deposited metal imposes great influence on corrosion resistance of stainless steel, in general, stainless steel welding rods having carbon content not higher than that of the base material or ultra-low carbon stainless steel welding rods are selected.



Instructions on stainless steel welding rods

(III) Precautions for stainless steel welding

Weldability of chromium stainless steel is poor, martensitic chromium stainless steel is prone to getting brittle and hard during welding and grains of ferritic chromium stainless steel are easy to grow under the action of high temperature during welding, which result in high brittleness of weld joints. Although chromium-nickel stainless steel has good weldability, the large welding current required will result in a series of issues, such as intergranular corrosion of welded joints, hot cracking traces of weld joints and increase in welding stress and deformation.

1. Stainless steel welding rods are usually of titanium-calcium and low hydrogen types. The welding current shall be of DC as far as possible, which is beneficial to overcoming defects of welding rods turning red and shallow depth of fusion. All-position welding is not suitable for welding rods covered with titanium-calcium coating, for which, downward welding and flat fillet welding are suitable. Welding rods covered with low-hydrogen coating allows all-position welding.

2. Keep stainless steel welding rods dry during use. In order to prevent cracking traces, pits, pores and other defects, welding rods covered with titanium-calcium coating shall be dried at 300-350 °C for 1h before welding, and welding rods covered with low-hydrogen coating shall be dried at 200-300 °C for 1h before welding. Multiple repeated drying is not allowed, because it may cause easy peeling off of the coating.

3. The weld crater shall be cleaned up and the welding rod shall be protected from being stained with oil and other dirt to avoid increasing the carbon content of the weld joint and affecting welding quality.

4. In order to prevent intergranular corrosion caused by heating, the welding current shall not be too large, which shall be about 20% lower than that of carbon steel welding rods in general. In addition, the arc shall not be too long, inter-layer fast cooling is adopted and string bead is preferred.

5. At the time of arc strike, it shall be paid attention not to striking the arc at the part to be welded. It is preferable to select the run-on plate made of the same material as that of the weldment for arc strike.

6. Short-arc welding shall be adopted as much as possible, because too long arc may easily result in hot cracking traces. The arc length is generally 2-3 mm.

7. Welding rod manipulation: It is required to adopt short-arc fast welding, generally not allowing lateral swing, which is aimed at reducing heat and width of the heat affected area, improving weld joints' resistance to intergranular corrosion and reducing the hot cracking tendency.

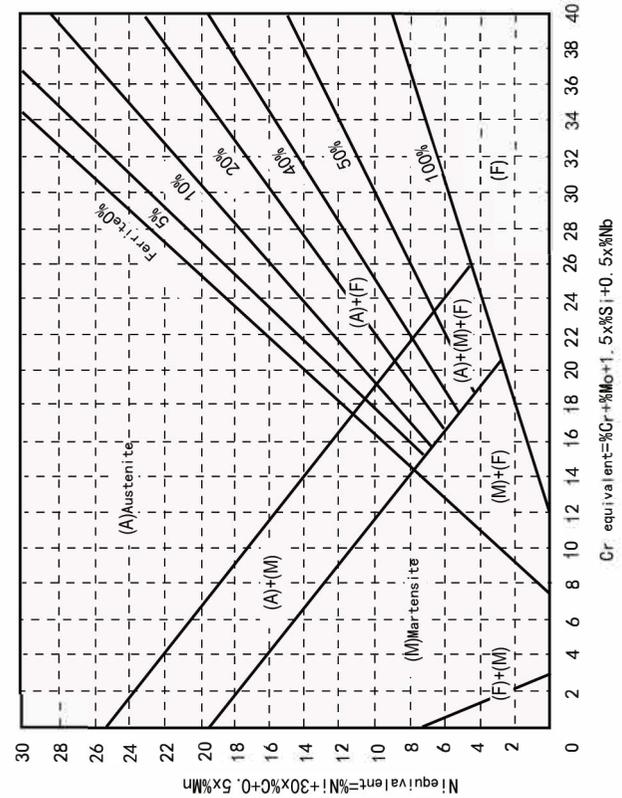
8. Welding rods applied to welding of dissimilar steel shall be carefully selected to prevent hot cracking traces due to improper welding rod selection or σ phase precipitation after high-temperature heat treatment, which will cause metal embrittlement. Select the appropriate welding rods referring to the selection criteria for welding rods applied to welding of stainless steel and dissimilar steel and adopt appropriate welding process.



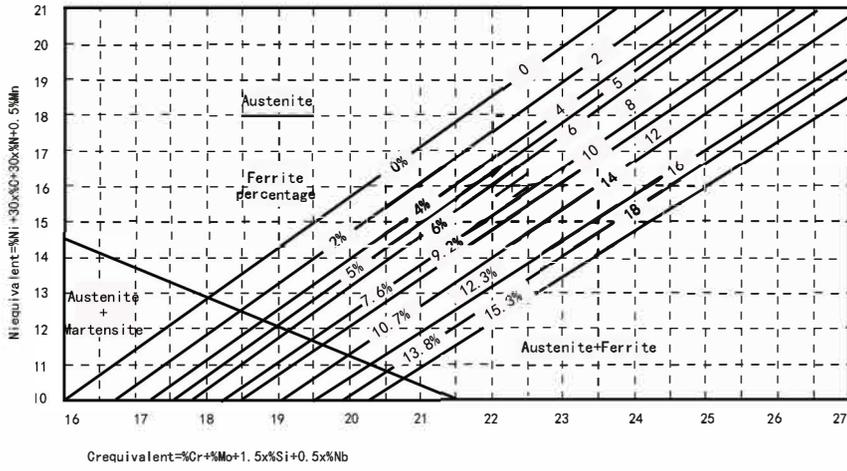
Method for determining ferrite content in austenitic stainless steel weld metal

Method	Principle of determining ferrite content
Ferrite tester	Compare the magnetic attraction force of the guide sample with that of the test piece
Ferrite display	Changes in magnetic induction are affected by ferrite content of the test piece, and therefore, determining changes in magnetic induction is enough.
Magnetic measuring instrument	Determine the force required to pull a standard permanent magnet away from the test piece
Organization chart method	Calculate Cr equivalent and Ni equivalent according to the chemical composition of the test piece, find out the intersection point of two equivalents on the organization chart and read it out. There are three commonly used organization charts, namely Schaeffer, Delong and WRC. See the figure below.
Method of counting pixels	Calculate the area percentage of ferrite in the microstructure of the test piece by an optical microscope

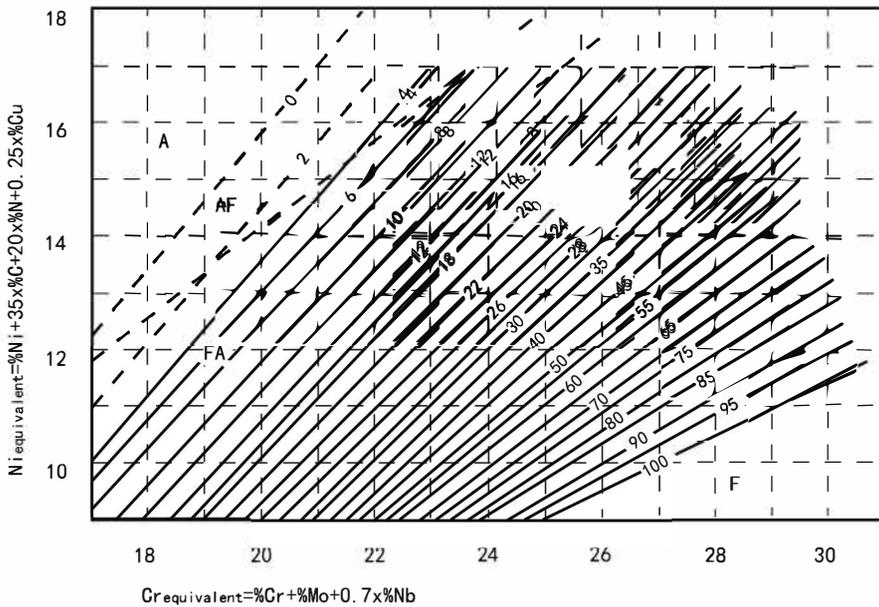
Schaeffer Organization Chart



Delong Organization Chart



WRC Organization Chart



A, AF, FA and F represent solidification modes
 A: Single phase austenite (r) AF: Pro-eutectoid phase (r) + eutectic ferrite (δ)
 FA: Pro-eutectoid phase (r) + peritectic / eutectoid phase (r) F: (δ) single phase crystallization



Welding rods recommended for commonly used stainless steel

Steel grade	National standard model	Type
022Cr18Ni10 022Cr19Ni11	E308L-16	A002
	E308-16	A102
06Cr19Ni9	E308-15	A107
	E347-16	A132
06Cr18Ni9Ti 06Cr18Ni11Ti 12Cr18Ni9Ti	E347-15	A137
	E316-16	A202
06Cr17Ni12Mo	E316-15	A207
	E316L-16	A022
06Cr18Ni12Mo2Ti	E318-16	A212
	E309-16	A302
06Cr24Ni13	E309-15	A307
	E310-16	A402
06Cr26Ni21	E310-15	A407
	E16-25MoN-16	A502
06Cr16Ni25Mo6	E16-25MoN-15	A507
	E410-16	G202
06Cr13	E410-15	G207

Welding rods recommended for welding of stainless steel clad plates

Types of steel plates	Model of welding rod		
	Base layer	Transition layer	Cover layer
06Cr13 + Q235	J422、 J426、 J427	A302 A307	A102 A107
06Cr13 + Q345(16Mn)	J502、 J506、 J507		
06Cr13 + 12CrMo	R202、 R207		A132 A137
06Cr18Ni9Ti + Q235 12Cr18Ni9Ti + Q235	J422、 J426、 J427		
06Cr18Ni9Ti + Q345(16Mn、 15MnV) 12Cr18Ni9Ti + Q345(16Mn、 15MnV)	J502、 J506、 J507	A312	A212
06Cr18Ni12Mo2Ti + Q235	J422、 J426、 J427		
06Cr18Ni12Mo2Ti + Q345(16Mn、 15MnV)	J502、 J506、 J507		

Selection of welding rods for welding of stainless steel and dissimilar steel

Base metal	Base metal									
	Mn13 steel	Low-Ni steel	Ni-Cr-Mo steel	Ni-Cr steel	Cr-Mo steel	Highcarbon steel	Medium-carbon steel	Lowcarbon steel	Cr13 steel	18-8 steel
18-8 steel	1 2 A	2 3 B	2 3 B	2 3 B	2 3 B	2 3 C	2 3 A	2 3 A	2 3 C	18-8 steel
Cr13 steel Cr17 steel	2 3 B	2 3 C	2 3 C	2 3 C	2 3 C	2 3 C	2 3 C	2 3 C	2 3 C	
Low-carbon steel	1 2 A	2.5Ni B	2 3 B	2 3 C	2 3 B	2 3 A	J427 A	J427 A		
Mediumcarbon steel	1 2 A	2.5Ni B	2 3 B	2 3 B	2 3 B	2 3 C	J507 A			
High-carbon steel	1 2 B	2 3 A	2 3 C	2 3 C	2 3 C	2 3 C				
Cr-Mo steel	1 2 B	2 3 B	2 3 C	2 3 C	2 3 C					
Ni-Cr steel	2 3 B	2 3 B	2 3 C	2 3 C						
Ni-Cr-Mo steel	2 3 B	2 3 B	2 3 C							
Low-Ni steel	1 2 A	2.5Ni A								
Mn13 steel	1 A									

Note: 1, 1, 2 and 3 in the Table respectively represent the following types of welding rods: 1 - 18-12Mo type; 2 - 25-13 type; 3 - 25-20 type.

2. A, B and C in the table respectively represent the following preheating temperatures: A - ambient temperature -50 °C ; B - 50-150 °C ; C - 150-250 °C.

3. 25-13 and 25-20 types of stainless steel welding rods shall be used for plug welding of stainless steel plates and the transition layer of clad plates (the part mixed with carbon steel).

4. The preheating temperature is determined according to the material, the structure, and the heat treatment state of the base material.

Concise table of stainless steel welding rods

Concise table of stainless steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
106	G202	E410-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr13 and 12Cr13 stainless steel structures, as well as for wear-resistant and corrosion-resistant surfacing.
107	G207	E410-15	Low hydrogen type	DCRP	The purpose is the same as that of G202 and all-position welding is possible.
108	G217	E410-15	Low hydrogen type	DCRP	It is used for welding of 06Cr13, 12Cr13 and 20Cr13 stainless steel structures, as well as for wear-resistant and corrosion-resistant surfacing.
109	G302	E430-16	Titaniumcalcium type	AC-DC	It is used for welding of corrosion-resistant (nitric acid) and heat-resistant Cr17 stainless steel structures.
110	G307	E430-15	Low hydrogen type	DCRP	The purpose is the same as that of G302 and all-position welding is possible.

Concise table of chromium-nickel stainless steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
111	A002	E308L-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low carbon Cr19Ni10 stainless steel structures, such as 022Cr19Ni10 and 06Cr19Ni11Ti.
112	A022	E316L-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low-carbon 022Cr19Ni12Mo2 stainless steel structures, as well as welding of stainless steel structures of synthetic fiber and other equipment.
113	A022Mo	E317L-16	Titaniumcalcium type	AC-DC	The purpose is the same as that of A022 and corrosion resistance is superior that of A022.
114	A032	E317LMoCu-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low carbon 022Cr19Ni13Mo2 stainless steel structure with high corrosion resistance in sulfuric acid medium.
115	A042	E309LMo-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low carbon 022Cr23Ni13Mo2 stainless steel structures and dissimilar steel.

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
116	A052		Titaniumcalcium type	AC-DC	It is used for welding of ultra-low carbon 022Cr18Ni24Mo5 stainless steel structures and dissimilar steel
117	A062	E309L-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low carbon 022Cr23Ni13 stainless steel structures and dissimilar steel
118	A102	E308-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr19Ni9 and 06Cr19Ni11Ti stainless steel structures with working temperature below 300°C
119	A107	E308-15	Low hydrogen type	DCRP	It is used for welding of 0Cr19Ni9 and 06Cr19Ni11Ti stainless steel structures with working temperature below 300°C and all-position welding is possible
120	A132	E347-16	Titaniumcalcium type	AC-DC	It is used for welding of important corrosion-resistant titanium-containing stable 06Cr19Ni11Ti stainless steel
121	A137	E347-15	Low hydrogen type	DCRP	The purpose is the same as that of A132 and all-position welding is possible
122	A172	E307-16	Titaniumcalcium type	AC-DC	It is used for welding of ASTM307 steel and dissimilar steel, as well as surfacing of impact-corrosion resistant steel and the transition layer, such as high-manganese steel and hardening steel
123	A202	E316-16	Titaniumcalcium type	AC-DC	The purpose is the same as that of A201
124	A207	E316-15	Low hydrogen type	DCRP	It is used for welding of 06Cr18Ni12Mo2 stainless steel, high-chromium steel Cr13, Cr17 requiring no heat treatment after welding and dissimilar steel. All-position welding is possible
125	A212	E318-16	Titaniumcalcium type	AC-DC	It is used for welding of important stainless steel, such as 06Cr18Ni12Mo and 022Cr17Ni14Mo2
126	A222	E317MoCu-16	Titaniumcalcium type	AC-DC	It is used for welding of copper-containing stainless steel (such as 06Cr19Ni13Mo2Cu) structures that are resistant to sulfuric acid medium corrosion
127	A232	E318V-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr19Ni10 and 06Cr18Ni12Mo2 stainless steel structures that are generally heat and corrosion resistant

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
128	A237	E318V-15	Low hydrogen type	DCRP	The purpose is the same as that of A232 and all-position welding is possible
129	A242	E317-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr19Ni13Mo3-type stainless steel structures, as well as welding of clad steel and dissimilar steel structures
130	A302	E309-16	Titaniumcalcium type	AC-DC	It is used for welding of structures made of 06Cr24Ni13-type stainless steel, dissimilar steel, high-chromium steel and high-manganese steel.
131	A302Fe	E309-16	Titaniumcalcium type	AC-DC	It is used for welding of the same type of stainless steel, stainless steel lining, dissimilar steel (Cr19Ni9 and low-carbon steel), high-chromium steel, high-manganese steel, etc.
132	A307	E309-15	Low hydrogen type	DCRP	The purpose is the same as that of A302 and all-position welding is possible
133	A312	E309Mo-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr24Ni13Mo2-type stainless steel, dissimilar steel and clad steel
134	A402	E310-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr26Ni21 heat-resistant stainless steel used under high temperature condition, chromium steel (Cr5Mo, Cr9Mo, Cr13, Cr28, etc.) and dissimilar steel
135	A407	E310-15	Low hydrogen type	DCRP	The purpose is the same as that of A402 and all-position welding is possible
136	A412	E310Mo-16	Titaniumcalcium type	AC-DC	The purpose is the same as that of A402, but crack, corrosion and heat resistance is better than that of A402 and A407.
137	A422		Titaniumcalcium type	AC-DC	It is used for welding of 06Cr25Ni20Si2 austenitic heat resistant steel and dissimilar steel
138	A502	E16-25MoN-16	Titaniumcalcium type	AC-DC	It is used for welding of as-quenched low-alloy steel, medium-alloy steel, dissimilar steel and high-rigidity structures, as well as welding of 06Cr16Ni25Mo6 heat resistant steel
139	A507	E16-25MoN-15	Low hydrogen type	DCRP	The purpose is the same as that of A502 and all-position welding is possible

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
140	A607	E330MoMn WNb-15	Low hydrogen type	DCRP	It is used for welding of 06Cr16Ni35, 06Cr20Ni35 and 06Cr18Ni37 stainless steel with high working temperature of 850-900°C
141	A902	E320-16	Titaniumcalcium type	AC-DC	It is used for welding of Carpenter200b nickel alloy in sulfuric acid, nitric acid, phosphoric acid and oxidizing acid corrosive media
142	JQ.E304		Titaniumcalcium type	AC-DC	It is used for welding of corrosion-resistant stainless steel structures with working temperature lower than 300 °C, such as Cr18Ni8, Cr17Ni7, 301, 302 and 304 stainless steel, or valve surfacing defects.
143	JQ•E309L	E309L-16	Titaniumcalcium type	AC-DC	It is commonly used for welding of stainless steel and other dissimilar steel, as well as welding of the transition layer of petrochemical pressure vessels and other equipment
144	JQ•E347L	E347L-16	Titaniumcalcium type	AC-DC	It is commonly used for welding of Cr19Ni9Ti-type stainless steel and surfacing of corrosion-resistant petrochemical equipment
145	JQ•E309Nb	E309Nb-16	Titaniumcalcium type	AC-DC	It is used for welding of 06Cr18Ni11Nb-type clad steel plates or surfacing on carbon steel

Concise table of duplex stainless steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
146	A1002	E312-16	Titaniumcalcium type	AC-DC	It is stainless steel welding rod of duplex steel structure. The deposited metal contains 40% of ferrite and has good crack resistance. It is used for welding of high-carbon steel, tool steel and dissimilar steel.
147	JQ•S2209	E2209-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low-carbon 022Cr22Ni5Mo3N, SAF2205 and other duplex stainless steel
148	JQ•S2215	E2209-15	Low hydrogen type	DCRP	The purpose is the same as that of JQ.S2216 and all-position welding is possible

Concise table of stainless steel welding rods used in nuclear power field

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
149	JQ•A002NP	E308L-16	Titaniumcalcium type	AC-DC	Be used for nuclear power engineering, such as welding of pressure vessels and corresponding structures
150	JQ•A062NP	A309L-16	Titaniumcalcium type	AC-DC	Be used for nuclear power engineering, such as welding of pressure vessels and corresponding structures

Concise table of cryogenic stainless steel welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
151	JQ•A002LT	E308L-16	Titaniumcalcium type	AC-DC	It is used for welding of ultra-low-carbon 00Cr19Ni10 or 06Cr18Ni11Ti stainless steel, enjoys good toughness at -196°C, and is applicable to welding of LNG storage tanks and pipelines
152	JQ•A022LT	E316L-16	Titaniumcalcium type	AC-DC	It is applicable to welding of 316L-type austenitic stainless steel pipe system, liquefied natural gas (LNG) storage tanks and pipelines and cryogenic equipment in service at ultra-low temperature of -196°C.



G202

Conform to GB/T 983 E410-16
 AWS A5.4 E410-16
 ISO 3581-A-E (13) R 3 2
 ISO 3581-B-ES 410-16

Instructions:G202 is Cr13 stainless steel welding rod covered with titanium-calcium coating, and it can be used under AC and DC.

Purpose:It is used for welding of 06Cr13 and 12Cr13 stainless steel structures, as well as surfacing of corrosion-resistant and wear-resistant structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	≤1.00	≤0.90	≤0.030	≤0.040	11.0-14.0	≤0.70	≤0.75	≤0.75
Measured value	0.080	0.30	0.45	0.015	0.021	12.20	0.30	0.030	0.035

Mechanical properties of deposited metal (maintain temperature of the test piece at 730-760°C for 1h, then cool to 315°C with the furnace at a speed not exceeding 110°C/h and subsequently conduct air cooling)

Test item	Rm (MPa)	A(%)
Guarantee value	≥450	≥15
Measured value	540	28

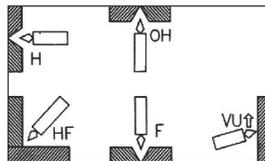
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The weldment shall be preheated to 250-350 °C before welding, and tempered at 730-760°C after welding.

Welding position



G207

Conform to GB/T 983 E410-15
 AWS A5.4 E410-15
 ISO 3581-A-E (13) B 4 2
 ISO 3581-B-ES 410-15

Instructions:G207 is chromium stainless steel welding rod covered with alkaline coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of 06Cr13 and 12Cr13 stainless steel structures, as well as surfacing of corrosion-resistant and wear-resistant structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	≤1.00	≤0.90	≤0.030	≤0.040	11.0-14.0	≤0.70	≤0.75	≤0.75
Measured value	0.054	0.55	0.20	0.007	0.020	12.50	0.12	0.030	0.030

Mechanical properties of deposited metal (maintain temperature of the test piece at 730-760°C for 1h, then cool to 315°C with the furnace at a speed not exceeding 60°C/h and subsequently conduct air cooling)

Test item	Rm (MPa)	A(%)
Guarantee value	≥450	≥15
Measured value	550	29

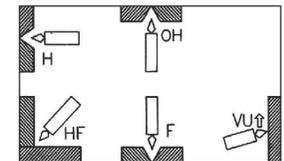
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The weldment shall be preheated to 250-350 °C before welding, and tempered at 730-760°C after welding.

Welding position





G217

Conform to GB/T 983 E410-15
 AWS A5.4 E410-15
 ISO 3581-A-E (13) B 4 2
 ISO 3581-B-ES 410-15

Instructions:G217 is Cr13 stainless steel welding rod covered with alkaline coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of 06Cr13, 12Cr13 and 20Cr13 stainless steel structures, such as repair welding and butt welding of blades of steam turbine, as well as surfacing of corrosion-resistant and wear-resistant structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	≤1.00	≤0.90	≤0.030	≤0.040	11.0-14.0	≤0.70	≤0.75	≤0.75

Mechanical properties of deposited metal (maintain temperature of the test piece at 730-760°C for 1h, then cool to 315°C with the furnace at a speed not exceeding 60°C/h and subsequently conduct air cooling)

Test item	Rm (MPa)	A(%)
Guarantee value	≥450	≥15

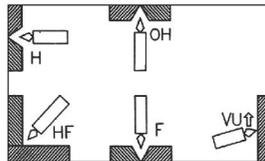
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~120	90~160	160~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The weldment shall be preheated to 300-350 °C before welding, and tempered at 730-760°C after welding.

Welding position



G302

Conform to GB/T 983 E430-16
 AWS A5.4 E430-16
 ISO 3581-A-E (17) R 3 2
 ISO 3581-B-ES 430-16

Instructions:G302 is Cr17 stainless steel welding rod covered with titanium coating, and it can be used under AC and DC.

Purpose:It is used for welding of Cr17 stainless steel structures that are resistant to nitric acid and heat.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.10	≤1.00	≤0.90	≤0.030	≤0.040	15.0-18.0	≤0.60	≤0.75	≤0.75

Mechanical properties of deposited metal (maintain temperature of the test piece at 760-790°C for 1h, then cool to 595°C with the furnace at a speed not exceeding 55°C/h and subsequently conduct air cooling)

Test item	Rm (MPa)	A(%)
Guarantee value	≥450	≥15

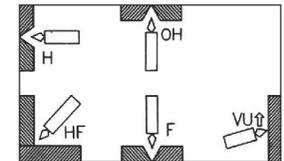
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The weldment shall be preheated to 200 °C before welding, and tempered at 760-790°C after welding.
3. The weldment must be cleaned of rust, oil stain, water and other impurities before welding.

Welding position





G307

Conform to GB/T 983 E430-15
 AWS A5.4 E430-15
 ISO 3581-A-E (17) B 4 2
 ISO 3581-B-ES 430-15

Instructions:G307 is Cr17 stainless steel welding rod covered with alkaline coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of Cr17 stainless steel structures that are resistant to nitric acid and heat.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.10	≤1.00	≤0.90	≤0.030	≤0.040	15.0-18.0	≤0.60	≤0.75	≤0.75

Mechanical properties of deposited metal (maintain temperature of the test piece at 760-790°C for 1h, then cool to 595°C with the furnace at a speed not exceeding 55°C/h and subsequently conduct air cooling)

Test item	Rm (MPa)	A(%)
Guarantee value	≥450	≥15

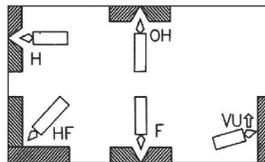
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at about 200-300°C for 1h before welding.
- 2.The weldment shall be preheated to 200 °C before welding, and tempered at 760-790°C after welding.
- 3.The weldment must be cleaned of rust, oil stain, water and other impurities before welding.

Welding position



A002

Conform to GB/T 983 E308L-16
 AWS A5.4 E308L-16
 ISO 3581-A-E (19 9 L) R 3 2
 ISO 3581-B-ES 308L-16

Instructions:A002 is ultra-low-carbon Cr19Ni10 stainless steel welding rod covered with titanium-calcium coating. Its deposited metal has carbon content of ≤0.04%. It has good intergranular corrosion resistance and good welding performance. In addition to good strength and anti-porosity, the coating is resistant to turning red. It can be used under AC and DC.

Purpose:It is used for welding of ultra-low-carbon 022Cr19Ni10 stainless steel structures, as well as welding of corrosion-resistant 06Cr18Ni11Ti stainless steel structures with working temperature below 300 °C . It is mainly used for manufacturing of synthetic fiber, fertilizer and petroleum equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.04	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-12.0	≤0.75	≤0.75
Measured value	0.024	1.30	0.62	0.008	0.020	19.90	9.80	0.040	0.035

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥510	≥30
Measured value	580	45

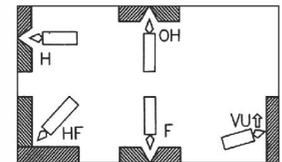
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A022

Conform to GB/T 983 E316L-16

AWS A5.4 E316L-16
ISO 3581-A-E (19 12 3 L) R 3 2
ISO 3581-B-ES 316L-16

Instructions:A022 is ultra-low carbon Cr18Ni12Mo2 stainless steel welding rod covered with titanium-calcium coating. Its deposited metal has carbon content of $\leq 0.04\%$. It has good heat, corrosion and crack resistance and anti-porosity, and has good operation performance. In addition to high strength, the coating is resistant to turning red. It can be used under AC and DC.

Purpose:It is used for welding of synthetic fiber and other equipment as well as the same type of stainless steel structures. Moreover, it can be also used for welding of chromium stainless steel, clad steel and dissimilar steel that cannot accept heat treatment after welding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤ 0.04	0.50-2.50	≤ 1.00	≤ 0.030	≤ 0.040	17.0-20.0	11.0-14.0	2.0-3.0	≤ 0.75
Measured value	0.025	1.20	0.60	0.007	0.021	19.05	11.60	2.45	0.038

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥ 490	≥ 25
Measured value	570	46

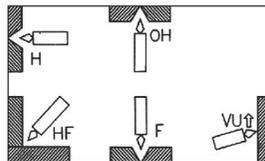
Reference current (AC.DC⁺)

Welding rod diameter (mm)	$\Phi 2.0$	$\Phi 2.5$	$\Phi 3.2$	$\Phi 4.0$	$\Phi 5.0$
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A022Mo

Conform to GB/T 983 E317L-16

AWS A5.4 E317L-16
ISO 3581-B-ES 317L-16

Instructions:A022Mo is ultra-low carbon Cr18Ni12Mo3 stainless steel welding rod covered with titanium-calcium coating. Its deposited metal has carbon content of $\leq 0.04\%$. It has good heat, corrosion and crack resistance and anti-porosity, especially that its corrosion resistance is better than that of A022. It has good operation performance. In addition to high strength, the coating is resistant to turning red. It can be used under AC and DC.

Purpose:It is used for welding of ultra-low carbon 022Cr18Ni12Mo3 stainless steel, as well as welding of chromium stainless steel, clad steel and dissimilar steel that cannot accept heat treatment after welding.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤ 0.04	0.50-2.50	≤ 1.00	≤ 0.030	≤ 0.040	18.0-21.0	12.0-14.0	3.0-4.0	≤ 0.75

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥ 510	≥ 20

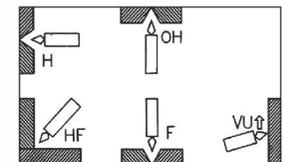
Reference current (AC.DC⁺)

Welding rod diameter (mm)	$\Phi 2.0$	$\Phi 2.5$	$\Phi 3.2$	$\Phi 4.0$	$\Phi 5.0$
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A032

Conform to GB/T 983 E317LMoCu-16

Instructions:A032 is ultra-low-carbon Cr19Ni13Mo2Cu stainless steel welding rod covered with titanium-calcium coating, which is characterized by good heat, corrosion and crack resistance, anti-porosity and excellent welding performance. It can be used under AC and DC.

Purpose:Because weld joints contain Mo and Cu, it has high corrosion resistance in sulfuric acid medium. Therefore, it can be used to weld the same type of ultra-low-carbon stainless steel structures of synthetic fiber equipment used in sulfuric acid medium of dilute and medium concentration, and weld Cr10Si3 acid resistant steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.04	0.50-2.50	≤0.90	≤0.030	≤0.035	18.0-21.0	12.0-14.0	2.00-2.50	≤2.00

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥540	≥25

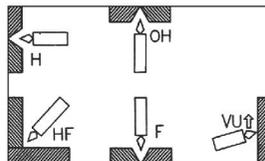
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A042

Conform to GB/T 983 E309LMo-16
AWS A5.4 E309LMo-16
ISO 3581-A-E(23 12 2 L) R 3 2
ISO 3581-B-ES 309LMo-16

Instructions:A042 is ultra-low-carbon Cr23Ni13Mo2 stainless steel welding rod covered with titanium-calcium coating, which can be used under AC and DC. Since proper amount of Mo is added to the weld joint, crack resistance and corrosion resistance of the weld metal are improved.

Purpose:It is used for welding of the same type of ultra-low-carbon stainless steel materials and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.04	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	2.00-3.00	≤0.75
Measured value	0.026	1.35	0.66	0.007	0.021	23.20	12.35	2.36	0.034

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥510	≥25
Measured value	595	38

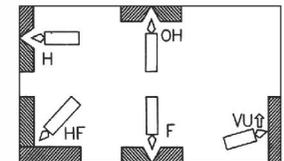
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A052



A062

Conform to GB/T 983 E309L-16
 AWS A5.4 E309L-16
 ISO 3581-A-E(23 12 L)R 32
 ISO 3581-B-ES 309L-16

Instructions:A052 is ultra-low-carbon Cr18Ni24Mo5 stainless steel welding rod covered with titanium-calcium coating. Its weld metal is resistant to pitting corrosion of media containing formic acid and acetic acid and chloride ion corrosion and its corrosion resistance is superior to that of A022, etc. It has excellent welding performance and can be used under AC and DC.

Purpose:It is used for welding of reactors and separators with chemical resistance to sulfuric acid, acetic acid and phosphoric acid, as well as welding of seawater corrosion resistant steel (022Cr18Ni24Mo5) and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.040	≤2.00	≤1.00	≤0.030	≤0.040	17.0-22.0	22.0-27.0	4.00-5.50	≤2.00

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥490	≥25

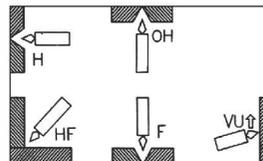
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



Instructions:A062 is ultra-low-carbon Cr23Ni13 stainless steel welding rod covered with titanium-calcium coating, and it can be used under AC and DC. Due to its low carbon content, it can resist intergranular corrosion caused by carbide precipitation when there are no stabilizers such as Nb and Ti.

Purpose:It is used for welding of the same type of stainless steel structures, clad steel and dissimilar steel components manufactured by synthetic fiber and petrochemical equipment, as well as surfacing of the transition layer of the inner wall of the nuclear reactor pressure vessel and welding of components inside the tower.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.040	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75
Measured value	0.024	1.32	0.65	0.007	0.021	23.30	12.90	0.045	0.035

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥510	≥25
Measured value	560	42

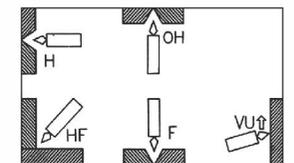
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A102

Conform to GB/T 983 E308-16
 AWS A5.4 E308-16
 ISO 3581-A-E(19 9) R 3 2
 ISO 3581-B-ES 308-16

Instructions:A102 is Cr19Ni10 stainless steel welding rod covered with titanium-calcium coating. The deposited metal has good mechanical properties and resistance to intergranular corrosion. It has excellent welding performance and anti-porosity, and the coating is resistant to turning red and cracking. It can be used under AC and DC.

Purpose:It is used for welding of corrosion resistant 06Cr19Ni10 and 06Cr18Ni11Ti stainless steel structures with working temperature below 300°C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-11.0	≤0.75	≤0.75
Measured value	0.038	1.35	0.68	0.008	0.022	19.75	9.60	0.064	0.10

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥30
Measured value	590	45

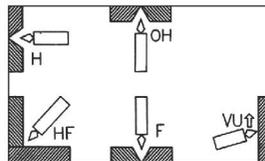
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A107

Conform to GB/T 983 E308-15
 AWS A5.4 E308-15
 ISO 3581-A-E(19 9) B 4 2
 ISO 3581-B-ES 308-15

Instructions:A107 is Cr19Ni10 stainless steel welding rod covered with alkaline coating. The deposited metal has good mechanical properties and resistance to intergranular corrosion. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of corrosion-resistant 06Cr19Ni10-type stainless steel structures with working temperature below 300°C, as well as welding of steel with poor weldability (such as high-chromium steel) and surfacing of the stainless steel surface layer.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.080	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-11.0	≤0.75	≤0.75
Measured value	0.056	1.90	0.24	0.006	0.021	20.00	9.50	0.068	0.11

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥30
Measured value	600	43

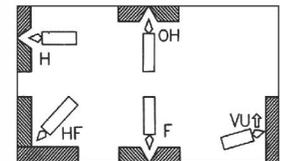
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~120	90~160	140~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The weldment shall be cleaned of impurities such as oil stain, rust and water before welding.

Welding position





A132

Conform to GB/T 983 E347-16
 AWS A5.4 E347-16
 ISO 3581-A-E(19 9 Nb)R 3 2
 ISO 3581-B-ES 347-16

Instructions:A132 is Cr19Ni10Nb stainless steel welding rod containing Nb stabilizer and covered with titanium-calcium coating, which has excellent resistance to intergranular corrosion and good mechanical properties. It is characterized by excellent welding performance and antiporosity, the coating is resistant to turning red and cracking, and it can be used under AC and DC.

Purpose:It is used for welding of important corrosion-resistant 06Cr18Ni11Ti-type stainless steel containing Ti stabilizer.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-11.0	≤0.75	≤0.75	8×C-1.00
Measured value	0.045	1.68	0.75	0.008	0.021	19.80	9.65	0.066	0.105	0.45

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	630	41

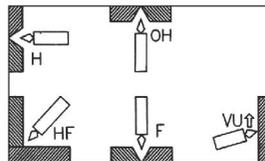
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A137

Conform to GB/T 983 E347-15
 AWS A5.4 E347-15
 ISO 3581-A-E(19 9 Nb)B 4 2
 ISO 3581-B-ES 347-15

Instructions:A137 is low carbon Cr19Ni10Nb stainless steel welding rod containing Nb stabilizer and covered with alkaline coating, which has excellent resistance to intergranular corrosion. Adopt DCRP and allposition welding is possible.

Purpose:It is used for welding of important corrosion-resistant 06Cr18Ni11Ti-type stainless steel containing Ti stabilizer.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-11.0	≤0.75	≤0.75	8×C-1.00
Measured value	0.058	1.90	0.30	0.007	0.021	19.75	9.58	0.068	0.10	0.48

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	640	38

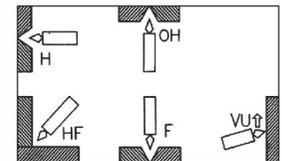
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~120	90~160	160~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





A172

Conform to GB/T 983 E307-16
 AWS A5.4 E307-16
 ISO 3581-A-E(18 9 Mn Mo)R 3 2
 ISO 3581-B-ES 307-16

Instructions:A172 is stainless steel welding rod covered with titaniumcalcium coating, which can be used under AC and DC. Weld metal has excellent crack resistance.

Purpose:It is applicable to welding of ASTM307 steel and other dissimilar steel, as well as surfacing of steel resistant to impact and corrosion and the transition layer. Such as high-manganese steel and hardening steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	0.04-0.14	3.30-4.75	≤1.00	≤0.030	≤0.040	18.00-21.50	9.00-10.70	0.50-1.50	≤0.75

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥590	≥25

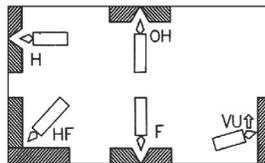
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~100	80~110	110~160	160~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A202

Conform to GB/T 983 E316-16
 AWS A5.4 E316-16
 ISO 3581-A-E(19 12 2)R 3 2
 ISO 3581-B-ES 316-16

Instructions:A202 is Cr18Ni12Mo2 stainless steel welding rod covered with titanium-calcium coating. Since Mo is added to the deposited metal, it has good corrosion, heat and crack resistance, and is particularly advantageous against chloride ion pitting. It has excellent operation performance and can be used under AC and DC.

Purpose:It is used for welding of steel used in organic and inorganic acid (non-oxidizing acid) media and 06Cr17Ni12Mo2 stainless steel or dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	17.0-20.0	11.0-14.0	2.0-3.0	≤0.75
Measured value	0.045	1.40	0.65	0.009	0.022	19.35	12.04	2.52	0.10

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	590	40

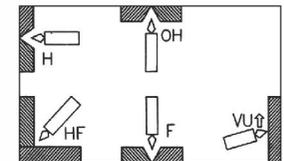
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A207

Conform to GB/T 983 E316-15
 AWS A5.4 E316-15
 ISO 3581-A-E(19 12 2)B 4 2
 ISO 3581-B-ES 316-15

Instructions:A207 is Cr18Ni12Mo2 stainless steel welding rod covered with alkaline coating. Since the deposited metal contains Mo, it has good corrosion, heat and crack resistance, and is particularly advantageous against chloride ion pitting. Adopt DCRP and all-position welding is possible.

Purpose:It is used for low carbon 06Cr17Ni12Mo2 stainless steel equipment, and welding of high-chromium steel (such as Cr13, Cr17) requiring no heat treatment after welding and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	17.0-20.0	11.0-14.0	2.0-3.0	≤0.75

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥520	≥25

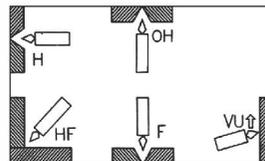
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~120	90~160	160~200

Precautions:

1. Welding rods must be baked at about 250°C for 1h before welding.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



A212

Conform to GB/T 983 E318-16
 AWS A5.4 E318-16
 ISO 3581-A-E(19 12 3 Nb)R 3 2
 ISO 3581-B-ES 318-16

Instructions:A212 is Cr18Ni12Mo2Nb stainless steel welding rod containing Nb stabilizer and covered with titanium-calcium coating. Its deposited metal has better resistance to intergranular corrosion than A202 and A207. It has excellent operation performance and can be used under AC and DC.

Purpose:It is used for welding of important 06Cr17Ni12Mo2 and 022Cr17Ni12Mo2, stainless steel, such as urea synthesizers and vinylon equipment that contact strongly corrosive media.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb+Ta
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	17.0-20.0	11.0-14.0	2.0-3.0	≤0.75	6X0-1.00
Measured value	0.045	0.95	0.70	0.010	0.022	19.20	11.93	2.40	0.11	0.45

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥20
Measured value	600	39

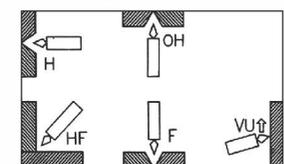
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A222

Conform to GB/T 983 E317MoCu-16

Instructions:A222 is Cr19Ni13Mo2Cu stainless steel welding rod covered with titanium-calcium coating. Since the deposited metal contains Cu, it has better corrosion resistance than other stainless steel welding rods in acid medium. It has excellent welding performance and can be used under AC and DC.

Purpose:It is used for welding of the same type of Cu-containing stainless steel equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤0.90	≤0.030	≤0.035	18.0-21.0	12.0-14.0	2.0-2.5	≤2.00

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥540	≥25

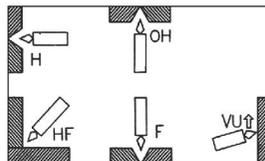
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A232

Conform to GB/T 983 E318V-16

Instructions:A232 is Cr18Ni12Mo2V stainless steel welding rod covered with titanium-calcium coating. Since the deposited metal contains V, it has good heat resistance and crack resistance. It has excellent welding performance and can be used under AC and DC.

Purpose:It is used for welding of 06Cr19Ni10 and 06Cr17Ni12Mo2 stainless steel structures that are generally heat resistant and have certain corrosion resistance.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	V
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.035	17.0-20.0	11.0-14.0	2.0-2.5	≤0.75	0.30-0.70

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥540	≥25

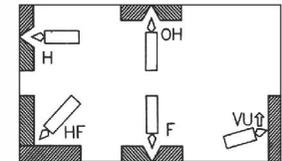
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A237

Conform to GB/T 983 E318V-15

Instructions:A237 is Cr18Ni12Mo2V stainless steel welding rod covered with alkaline coating. Since the deposited metal contains V, it has good heat resistance and crack resistance. Adopt DCRP and allposition welding is possible.

Purpose:It is used for multi-layer welding of 06Cr19Ni10 and 06Cr17Ni12Mo2 stainless steel structures that are generally heat resistant and have certain corrosion resistance.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	V
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.035	17.0-20.0	11.0-14.0	2.0-2.5	≤0.75	0.30-0.70
Measured value	0.050	1.95	0.28	0.009	0.021	18.96	11.85	2.35	0.10	0.48

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥540	≥25
Measured value	600	41

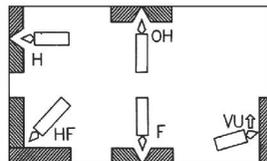
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~120	90~160	140~200

Precautions:

- 1.Welding rods must be baked at about 250°C for 1h before welding.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



A242

Conform to GB/T 983 E317-16
AWS A5.4 E317-16
ISO 3581-B-ES 317-16

Instructions:A242 is Cr19Ni13Mo3 stainless steel welding rod covered with titanium-calcium coating. Considering its deposited metal has higher Mo content than that of A202, it has better corrosion resistance to nonoxidizing acid (such as sulfuric acid, sulfurous acid and phosphoric acid) and organic acid. In addition, it also has good effect on pitting resistance and can be used under AC and DC.

Purpose:It is used for welding of the same type of stainless steel materials, clad steel and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	12.0-14.0	3.0-4.0	≤0.75

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥20

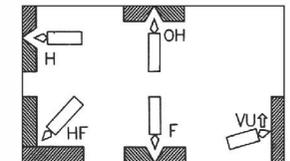
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A302

Conform to GB/T 983 E309-16
 AWS A5.4 E309-16
 ISO 3581-A-E(22 12)R 3 2
 ISO 3581-B-ES 309-16

Instructions:A302 is Cr23Ni13 stainless steel welding rod covered with titanium-calcium coating, and the deposited metal has good crack resistance and oxidation resistance. It has good operation performance and can be used under AC and DC.

Purpose:It is used for welding of the same type of stainless steel, stainless steel lining, dissimilar steel (Cr19Ni9 and low-carbon steel),high-chromium steel and high-manganese steel, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.15	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75
Measured value	0.055	1.45	0.70	0.009	0.021	24.25	12.75	0.35	0.10

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	595	40

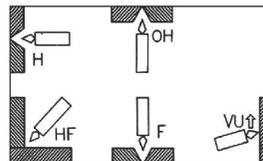
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A302Fe

Conform to GB/T 983 E309-16
 AWS A5.4 E309-16
 ISO 3581-A-E(22 12)R 5 3
 ISO 3581-B-ES 309-16

Instructions:A302Fe is Cr23Ni13 high-efficiency stainless steel welding rod covered with titanium-calcium coating. The deposited metal has good crack resistance and oxidation resistance and the welding rod coating has excellent resistance to cracking and turning red. It is suitable for largescale backing welding, downward welding and fillet welding, and has good operation performance.

Purpose:It is used for welding of the same type of stainless steel, stainless steel lining, dissimilar steel (Cr19Ni9 and low-carbon steel), high-chromium steel, high-manganese steel, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.15	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75
Measured value	0.068	1.73	0.75	0.008	0.014	24.30	13.50	0.019	0.005

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	620	33

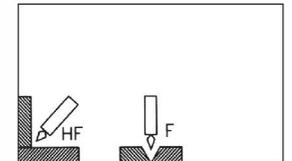
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~130	120~160	180~240	240~280

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Remove rust and oil stain from the weldment before welding

Welding position





A307

Conform to GB/T 983 E309-15
 AWS A5.4 E309-15
 ISO 3581-A-E(22 12)B 4 2
 ISO 3581-B-ES 309-15

Instructions:A307 is Cr23Ni13 stainless steel welding rod covered with alkaline coating, and the deposited metal has good crack resistance and oxidation resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of the same type of stainless steel, dissimilar steel, high-chromium steel, high-manganese steel, etc.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.15	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75
Measured value	0.057	1.30	0.22	0.007	0.022	23.43	12.82	0.12	0.12

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	600	38

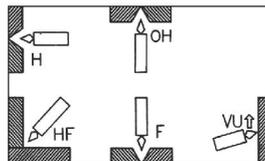
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~120	90~160	140~200

Precautions:

- 1.Welding rods must be baked at about 250°C for 1h before welding.
- 2.The current shall not be too large during operation.

Welding position



A312

Conform to GB/T 983 E309Mo-16
 AWS A5.4 E309Mo-16
 ISO 3581-B-ES 309Mo-16

Instructions:A312 is Cr23Ni13Mo2 stainless steel welding rod covered with titanium-calcium coating. Due to the high Mo content of the weld joint, it has better corrosion, crack and oxidation resistance than A302. It has good operation performance and can be used under AC and DC.

Purpose:It is used for welding of stainless steel containers of the same type that are resistant to sulfuric acid medium (ammonium sulfate) corrosion, as well as welding of stainless steel lining, clad steel and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	2.0-3.0	≤0.75
Measured value	0.052	1.40	0.68	0.009	0.022	23.10	12.74	2.36	0.11

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	615	40

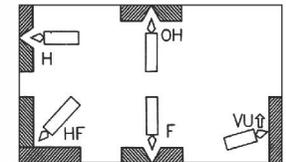
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A402

Conform to GB/T 983 E310-16
 AWS A5.4 E310-16
 ISO 3581-A-E(25 20)R 3 2
 ISO 3581-B-ES 310-16

Instructions:A402 is Cr26Ni21 pure austenitic stainless steel welding rod covered with titanium-calcium coating. The deposited metal has excellent oxidation resistance at high temperature of 900-1000°C. It has good welding performance and can be used under AC and DC.

Purpose:It is used for welding of the same type of heat-resistant stainless steel used under high temperature conditions, and also for welding of chromium steel with high hardenability (such as Cr5Mo, Cr9Mo, Cr13 and Cr28) and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	0.08-0.20	1.00-2.50	≤0.75	≤0.030	≤0.030	25.0-28.0	20.0-22.5	≤0.75	≤0.75
Measured value	0.13	2.00	0.60	0.007	0.022	26.65	21.10	0.045	0.10

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	610	38

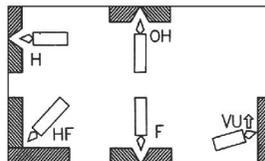
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300°C for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A407

Conform to GB/T 983 E310-15
 AWS A5.4 E310-15
 ISO 3581-A-E(25 20)B 4 2
 ISO 3581-B-ES 310-15

Instructions:A407 is Cr26Ni21 pure austenitic stainless steel welding rod covered with alkaline coating. The deposited metal has excellent oxidation resistance at high temperature of 900-1100 °C . Adopt DCRP and all-position welding is possible. Since the weld joint is pure austenite, the hot crack resistance is not as good as that of the duplex structure.

Purpose:It is used for welding of the same type of heat-resistant stainless steel, stainless steel lining and dissimilar steel, as well as welding of Cr5Mo, Cr9Mo, Cr13 and Cr28 steel with high hardenability.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	0.08-0.20	1.00-2.50	≤0.75	≤0.030	≤0.030	25.0-28.0	20.0-22.5	≤0.75	≤0.75
Measured value	0.11	1.70	0.30	0.007	0.021	26.10	20.76	0.048	0.12

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	590	38

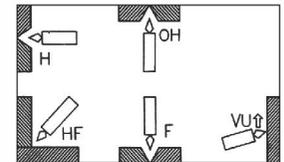
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~120	90~160	140~200

Precautions:

- 1.Welding rods must be baked at about 250°C for 1h before welding.
- 2.The current shall not be too large during operation.

Welding position





A412

Conform to GB/T 983 E310Mo-16
AWS A5.4 E310Mo-16
ISO 3581-B-ES 310Mo-16

Instructions:A412 is Cr26Ni21Mo2 pure austenitic stainless steel welding rod covered with titanium-calcium coating. Since Mo is added to the deposited metal, its corrosion, heat and crack resistance is improved compared with A402 and A407. It can be used under AC and DC and the operation performance is good.

Purpose:It is used for welding of heat-resistant stainless steel used under high temperature conditions, as well as welding of stainless steel lining and dissimilar steel. It has excellent toughness when being used to weld carbon steel and low-alloy steel with high hardenability.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	1.00-2.50	≤0.75	≤0.030	≤0.030	25.0-28.0	20.0-22.0	2.0-3.0	≤0.75
Measured value	0.075	1.72	0.67	0.008	0.022	26.15	20.68	2.46	0.10

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥28
Measured value	630	39

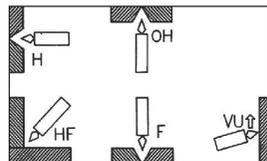
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A422

Conform to GB/T 983

Instructions:A422 is Cr25Ni18Mn8 stainless steel welding rod covered with titanium-calcium coating, which can be used under AC and DC.Considering a large amount of Mn is added to the weld joint, the hot crack resistance of the weld joint is improved.

Purpose:It is used for repair welding of Cr25Ni20Si2 austenitic heatresistant steel drum on the furnace rolling machine and welding of dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni
Guarantee value	≤0.20	5.0-10.0	≤1.20	≤0.030	≤0.030	23.0-27.0	16.0-21.0
Measured value	0.080	6.18	0.80	0.006	0.020	24.76	18.60

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥540	≥30
Measured value	580	41

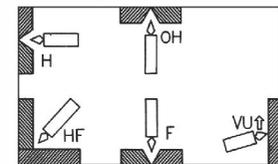
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.When welding, string bead is preferred and short arc operation shall be adopted in order to prevent overheating of the molten bath and burning loss of alloying elements. Ensure that the crater is full before extinguishing the arc.
- 3.For multi-layer welding of large thick weldments, it is advisable to hammer and knock weld joints and edges to refine grains and reduce stress.

Welding position





A502

Conform to GB/T 983 E16-25MoN-16

Instructions:A502 is pure austenitic Cr16Ni25Mo6 stainless steel welding rod covered with titanium-calcium coating, which can be used under AC and DC.

Purpose:It is used for welding of as-quenched low-alloy and medium alloy steel, dissimilar steel, structures with large rigidity, as well as corresponding heat resistant steel. Such as welding of as-quenched 30CrMnSi, stainless steel, carbon steel and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
Guarantee value	≤0.12	0.50-2.50	≤0.90	≤0.030	≤0.035	14.0-18.0	22.0-27.0	5.0-7.0	≤0.75	≥0.10
Measured value	0.050	1.15	0.50	0.008	0.021	16.26	24.60	5.86	0.10	0.14

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥610	≥30
Measured value	650	40

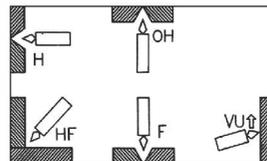
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



A507

Conform to GB/T 983 E16-25MoN-15

Instructions:A507 is pure austenitic Cr16Ni25Mo6 stainless steel welding rod covered with titanium-calcium coating, which adopts DCRP and all-position welding is possible.

Purpose:It is used for welding of as-quenched low-alloy and medium alloy steel, dissimilar steel, structures with large rigidity, as well as corresponding heat resistant steel. Such as welding of as-quenched 30CrMnSi, stainless steel, carbon steel and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
Guarantee value	≤0.12	0.50-2.50	≤0.90	≤0.030	≤0.035	14.0-18.0	22.0-27.0	5.0-7.0	≤0.75	≥0.10
Measured value	0.055	1.65	0.34	0.007	0.020	15.85	24.45	5.90	0.11	0.13

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥610	≥30
Measured value	655	40

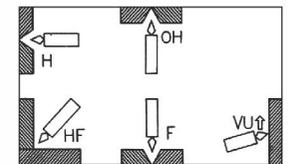
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

1. Welding rods must be baked at 300°C for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A607

Conform to GB/T 983 E330MoMnWNB-15

Instructions:A607 is pure austenitic Cr16Ni35 stainless steel welding rod covered with alkaline coating. It has good high temperature performance due to addition of strengthening elements to the welding rod coating. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of the same type of stainless steel materials used at high temperature of 850-900 °C , and welding of the collecting pipe and the expansion pipe (such as Cr20Ni32 and Cr18Ni37) in the hydrogen manufacturing conversion furnace.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	W	Nb
Guarantee value	≤0.20	≤3.50	≤0.70	≤0.030	≤0.035	15.0-17.0	33.0-37.0	2.0-3.0	≤0.75	2.0-3.0	1.0-2.0

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥590	≥25

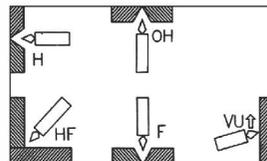
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~120	90~160	140~200

Precautions:

- 1.Welding rods must be baked at about 250 °C. for 1h before welding.
2. The current shall not be too large during operation.

Welding position



A902

Conform to GB/T 983 E320-16
AWS A5.4 E320-16
ISO 3581-B-ES 320-16

Instructions:A902 is stainless steel welding rod covered with titaniumcalcium coating, which can be used under AC and DC. It has excellent corrosion resistance and relatively strong oxidation resistance. It is widely applied to manufacturing and installation engineering of chemical, petroleum and hydrogen manufacturing equipment, and can also be used as a dissimilar steel welding material.

Purpose:It is used for welding of Carpenter20Cb nickel alloy in sulfuric acid, nitric acid, phosphoric acid and oxidizing acid corrosive media.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb
Guarantee value	≤0.07	0.50-2.50	≤0.60	≤0.030	≤0.040	19.0-21.0	32.0-36.0	2.0-3.0	3.0-4.0	8×C-1.00

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥28

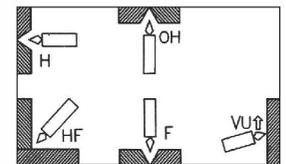
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.0	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300 °C. for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





Conform to GB/T 983 E309L-16
 AWS A5.4 E309L-16
 ISO 3581-A-E(23 12 L)R 3 2
 ISO 3581-B-ES 309L-16

Instructions:JQ·E304 is Cr18Ni8 stainless steel welding rod covered with rutile coating, which is characterized by excellent welding performance, stable arc, low spatter, easy slag removal and beautiful appearance and allows all-position welding. It can be used under AC and DC.

Purpose:It is used for welding of corrosion-resistant stainless steel structures with working temperature lower than 300 C , such as Cr18Ni8, Cr17Ni7, 301, 302 and 304 stainless steel, or valve surfacing.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.08	0.50-2.50	≤1.00	≤0.030	≤0.040	17.0-20.0	7.50-10.50	≤0.75	≤0.75
Measured value	0.043	0.80	0.75	0.006	0.037	18.2	8.2	0.065	0.35

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥30
Measured value	595	37

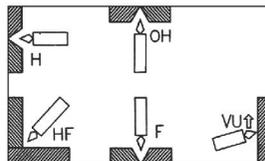
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.0	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	40~80	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300 ℃. for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



Instructions:JQ·E309L is ultra-low carbon Cr23Ni13 stainless steel welding rod covered with titanium-calcium coating. It has excellent crack resistance. It can be used under AC and DC and all-position welding is possible.

Purpose:It is commonly used for welding of stainless steel and other dissimilar steel, as well as welding of the transition layer of petrochemical pressure vessels and other equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.04	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75
Measured value	0.023	1.75	0.70	0.009	0.021	23.75	13.40	0.047	0.036

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥510	≥25
Measured value	590	40

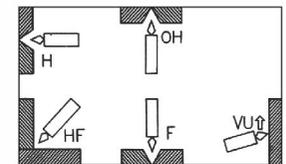
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300 ℃. for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





JQ•E347L

Conform to GB/T 983 E347L-16
AWS A5.4 E347-16
ISO 3581-B-ES 347L-16

Instructions:JQ•E347L is ultra-low-carbon Cr19Ni10Nb stainless steel welding rod containing Nb stabilizer and covered with titanium-calcium coating, which is characterized by excellent intergranular corrosion resistance. It can be used under AC and DC and all-position welding is possible.

Purpose:It is commonly used for welding of 06Cr18Ni11Ti-type stainless steel and surfacing of corrosion-resistant petrochemical equipment.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb
Guarantee value	≤0.04	0.50-2.50	≤1.00	≤0.030	≤0.040	18.0-21.0	9.0-11.0	≤0.75	≤0.75	8×C-1.00
Measured value	0.028	1.70	0.68	0.006	0.020	19.30	9.85	0.042	0.038	0.40

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥510	≥25
Measured value	590	41

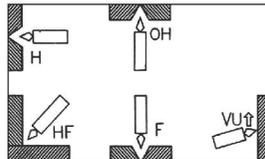
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position



JQ•E309Nb

Conform to GB/T 983 E309Nb-16
AWS A5.4 E309Nb-16
ISO 3581-A-E(23 12 Nb)R 3 2
ISO 3581-B-ES 309Nb-16

Instructions:JQ•E309Nb is stainless steel welding rod covered with titanium-calcium coating. Since the deposited metal contains Nb, it has better intergranular corrosion resistance and its high-temperature strength is improved.

Purpose:It is used for welding of 06Cr18Ni11Nb-type clad steel plates or surfacing on carbon steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb
Guarantee value	≤0.12	0.50-2.50	≤1.00	≤0.030	≤0.040	22.0-25.0	12.0-14.0	≤0.75	≤0.75	0.70-1.00
Measured value	0.070	1.50	0.67	0.008	0.021	23.80	12.65	0.065	0.10	0.90

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥550	≥25
Measured value	630	38

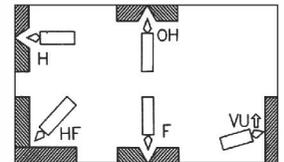
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	50~100	70~130	100~160	140~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.Select DC power supply as far as possible, and the current shall not be too large.

Welding position





A1002

Conform to GB/T 983 E312-16
 AWS A5.4 E312-16
 ISO 3581-A-E(29 9)R 3 2
 ISO 3581-B-ES 312-16

Instructions:A1002 is duplex steel welding rod covered with titaniumcalcium coating. The deposited metal has excellent crack resistance because it contains about 40% of ferrite. It has good welding performance.

Purpose:It is used for welding of high-carbon steel, tool steel, hightemperature steel, armor steel and dissimilar steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.15	0.50-2.50	≤1.00	≤0.030	≤0.040	28.0-32.0	8.0-10.5	≤0.75	≤0.75

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥660	≥15

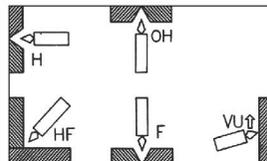
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	50~80	80~110	110~160	160~220

Precautions:

- 1.Welding rods must be baked at about 300 ℃ for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position



JQ·S2209

Conform to GB/T 983 E2209-16,
 AWS A5.4 E2209-16
 ISO 3581-A-E(22 9 3 N L)R 3 2
 ISO 3581-B-ES 2209-16

Instructions:JQ·S2209 is ultra-low-carbon duplex stainless steel welding rod covered with titanium-calcium coating. Considering the deposited metal contains 40%-50% of ferrite, it has excellent mechanical properties and corrosion resistance, especially reliable chlorine corrosion resistance and high pitting resistance. It has good welding performance. It can be used under AC and DC.

Purpose:It is used for welding of ultra-low-carbon 022Cr22Ni5Mo3N, SAF2205 and other duplex stainless steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
Guarantee value	≤0.04	0.50-2.00	≤1.00	≤0.030	≤0.040	21.5-23.5	7.50-10.50	2.5-3.5	≤0.75	0.08-0.20
Measured value	0.032	1.20	0.69	0.012	0.021	22.75	9.34	3.00	0.10	0.13

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥690	≥15
Measured value	790	28

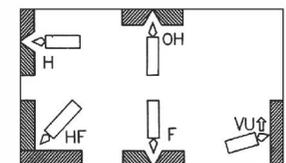
Reference current (AC.DC +)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	90~120	120~160

Precautions:

- 1.Welding rods must be baked at about 300 ℃ for 1.5h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.

Welding position





JQ·S2215

Conform to GB/T 983 E2209-15

AWS A5.4 E2209-15
ISO 3581-A-E(22 9 3 N L)B 4 2
ISO 3581-B-ES 2209-15

Instructions:JQ·S2215 is ultra-low-carbon duplex stainless steel welding rod covered with alkaline coating. Considering the deposited metal contains 40%-50% of ferrite, it has excellent mechanical properties and corrosion resistance, especially reliable chlorine corrosion resistance and high pitting resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of ultra-low-carbon 022Cr22Ni5Mo3N, SAF2205 and other duplex stainless steel.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	N
Guarantee value	≤0.04	0.50-2.00	≤1.00	≤0.030	≤0.040	21.5-23.5	7.50-10.50	2.5-3.5	≤0.75	0.08-0.20

Mechanical properties of deposited metal

Test item	Rm (MPa)	A(%)
Guarantee value	≥690	≥15

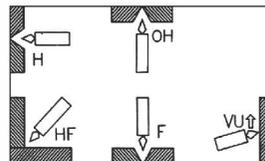
Reference current (DC⁺)

Welding rod diameter (mm)		Φ 3.2
Welding current (A)	Downward welding	90~120
	Vertical position welding	80~100

Precautions:

1. Welding rods must be baked at about 250℃ for 1h before welding.
2. The current shall not be too large during operation.

Welding position



JQ·A002NP

Conform to GB/T 983 E308L-16

AWS A5.4 E308L-16
ISO 3581-A-E (19 9 L) R 3 2
ISO 3581-B-ES 308L-16
NB/T 20009.3 E308L

Instructions:JQ.A002NP is ultra-low-carbon stainless steel welding rod covered with rutile coating used in nuclear power field, which has good intergranular corrosion resistance. It is characterized by excellent welding performance, low spatter, easy slag removal, stable arc and beautiful weld joint appearance. It can be used under AC and DC and all-position welding is possible.

Purpose:It is used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo
Guarantee value	≤0.030	0.50-2.00	≤0.90	≤0.010	≤0.020	18.0-21.0	9.0-11.0	≤0.50
Measured value	0.024	1.50	0.70	0.002	0.010	20.05	10.20	0.015

Test item	Co	Cu	N	Ti	V	Nb+Ta	δ ferrite content
Guarantee value	≤0.050	≤0.15	≤0.07	—	—	—	7~15%
Measured value	0.017	0.008	0.040	0.010	0.005	0.014	12.5

Mechanical properties of deposited metal

Test item	Rm (MPa)	Rel/Rp0.2(MPa)	A(%)	KV2(J) Normal temperature	Heat treatment state
Guarantee value	550~670	≥345	≥35	≥60	—
Measured value	564	388	43	70	As-welded
	559	362	41.5	67.5	595-625℃×16h
	568	381	42.5	68	595-625℃×40h

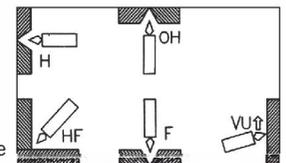
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~120	130~160	150~200

Precautions:

1. Welding rods must be baked at 300℃ for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.
3. The weldment must be cleaned of impurities such as oil stain, rust and water before welding.
4. Small current and short arc shall be used as far as possible for welding and the swing width shall not exceed 2.5 times the diameter of the welding rod.

Welding position





JQ·A062NP

Conform to GB/T 983 E309L-16
 AWS A5.4 E309L-16
 ISO 3581-A-E (23 12 L) R 3 2
 ISO 3581-B-ES 309L-16
 NB/T 20009.3 E309L

Instructions:JQ.A062NP is ultra-low-carbon stainless steel welding rod covered with rutile coating used in nuclear power field. It is characterized by excellent welding performance, low spatter, easy slag removal, stable arc and beautiful weld joint appearance. It can be used under AC and DC and all-position welding is possible.

Purpose:It is used for nuclear power engineering, such as welding of pressure vessels and corresponding structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Ni	Mo
Guarantee value	≤0.030	0.50-2.50	≤0.90	≤0.010	≤0.020	22.0-25.0	11.0-14.0	≤0.50
Measured value	0.023	1.50	0.72	0.002	0.013	23.0	13.20	0.015
Test item	Co	Cu	N	Ti	V	Nb+Ta	δ ferrite content	
Guarantee value	≤0.050	≤0.15	≤0.07	—	—	—	8~18%	
Measured value	0.017	0.011	0.040	0.004	0.005	0.012	12	

Mechanical properties of deposited metal

Test item	Rm (MPa)	Rel/Rp0.2(MPa)	A(%)	KV2(J) Normal temperature	Heat treatment state
Guarantee value	520~700	≥345	≥30	≥50	—
Measured value	548	399	40	65	As-welded
	552	374	38	55	595-625°C×16h

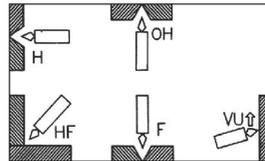
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~90	90~120	130~160	150~200

Precautions:

1. Welding rods must be baked at 300℃ for 1h before welding.
2. Select DC power supply as far as possible, and the current shall not be too large.
3. The weldment must be cleaned of impurities such as oil stain, rust and water before welding.
4. Small current and short arc shall be used as far as possible for welding and the swing width shall not exceed 2.5 times the diameter of the welding rod.

Welding position



JQ·A002LT

Conform to GB/T 983 E308L-16
 AWS A5.4 E308L-16

Instructions:JQ·A002LT is ultra-low-carbon stainless steel welding rod covered with titanium-calcium coating. Its weld metal has good mechanical properties and intergranular corrosion resistance; especially at -196℃, it still has good impact toughness. It can be used under AC and DC. The welding rod is resistant to turning red, arc is soft, appearance is beautiful, slag removal is easy, spatter is low, all-position welding performance is excellent and operability is good.

Purpose:It is used for welding of ultra-low-carbon 00Cr19Ni10 or 06Cr18Ni11Ti stainless steel, enjoys good toughness at -196℃, and is applicable to welding of LNG storage tanks and pipelines

Chemical composition of deposited metal (%)

Test item	C	S	Si	Mn	P	Cr	Ni	Mo	Cu
Standard	≤0.040	≤0.030	≤1.00	0.50-2.50	≤0.040	18.0-21.0	9.0-12.0	≤0.75	≤0.75
Measured value	0.030	0.003	1.00	0.68	0.013	18.40	10.65	0.025	0.020

Mechanical properties of deposited metal

Test item	Tensile strength Rm (MPa)	Elongation A(%)	Impact absorbing energy KV ₂ (J) -196℃
Standard	≥510	≥30	≥31
Measured value	560	46	39

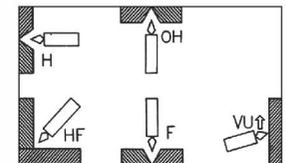
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~90	90~120	130~160	150~200

Precautions:

1. Welding rods must be baked at 300℃ for 1h before welding and they shall be baked immediately before use.
2. Select small current and short arc for welding as far as possible.
3. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position





Instructions:JQ·A022LT is ultra-low-carbon stainless steel welding rod covered with titanium-calcium coating. Its weld metal has good mechanical properties and intergranular corrosion resistance; especially at -196℃, it still has good impact toughness. It can be used under AC and DC. The welding rod is resistant to turning red, arc is soft, appearance is beautiful, slag removal is easy, spatter is low, all-position welding performance is excellent and operability is good.

Purpose:It is applicable to welding of 316L-type austenitic stainless steel pipe system, liquefied natural gas (LNG) storage tanks and pipelines and cryogenic equipment in service at ultra-low temperature of -196℃.

Chemical composition of deposited metal (%)

Test item	C	S	Mn	Si	P	Cr	Ni	Mo	Cu
Standard	≤0.040	≤0.030	0.50-2.50	≤1.00	≤0.040	17.0-20.0	11.0-14.0	2.0-3.0	≤0.75
Measured value	0.024	0.004	0.96	0.55	0.020	18.00	13.20	2.20	0.035

Mechanical properties of deposited metal

Test item	Tensile strength Rm (MPa)	Elongation A(%)	Impact absorbing energy KV ₂ (J) -196℃
Standard	≥490	≥25	≥31
Measured value	550	40	38

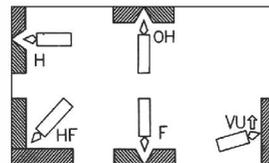
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~90	90~120	130~160	150~200

Precautions:

1. Welding rods must be baked at 300℃ for 1h before welding and they shall be baked immediately before use.
2. Select small current and short arc for welding as far as possible.
3. The rust, oil stain, water and other impurities of the weldment must be removed before welding.

Welding position



Surfacing welding rods

Surfacing is the welding process in which a wear-resistant, corrosion-resistant, and heat-resistant metal layer is applied to the surface or edge of the workpiece. It has significant economic benefits for repair and improvement of the service life of parts, rational use of materials, improvement of product performance and cost reduction. Surfacing work and working conditions are very complicated. Therefore, it is necessary to select suitable welding rods according to different requirements for surfacing. Different surfacing processes shall be selected for different workpieces and welding rods for surfacing so as to obtain the desirable surfacing effect.

The most common problem occurred in surfacing is cracking and the major methods for preventing cracking include:

1. preheating before welding, inter-layer temperature control and slow cooling after welding.
2. The stress relief heat treatment shall be conducted after welding.
3. In order to avoid cracking during multi-layer surfacing, select lowhydrogen surfacing welding rods.
4. When necessary, there shall be a transition layer (use welding rods with low carbon equivalent and high toughness) between the surfacing layer and the base metal formed through surfacing. There is direct relationship between cracking and the carbon content, alloying elements of the workpiece and deposited metal of weld joint. Therefore, the preheating temperature is generally estimated based on the carbon equivalent of the welding rod selected.

The formula of carbon equivalent is as follows: :

$$Ceq=C+\frac{1}{6}Mn+\frac{1}{24}Si+\frac{1}{5}Cr+\frac{1}{4}Mo+\frac{1}{15}Ni$$

This estimation formula is suitable for low, medium and high carbon steel and low-alloy steel materials.

Carbon equivalent(%)	Preheating temperature	Carbon equivalent(%)	Preheating temperature
≤0.40	Above 100℃	≤0.70	Above 250℃
≤0.50	Above 150℃	≤0.80	Above 300℃
≤0.60	Above 200℃	≤0.90	Above 350℃

Preheating is not unnecessary for high-manganese steel and austenitic stainless steel.

The preheating temperature for high-alloy steel is above 400℃.

The surfacing effect refers to hardness, wear resistance and heat resistance of the welding layer, and its performance is related to the following factors:

1. Magnitude of welding current and length of arc. Large current, together with long arc, makes alloying elements easily burnt. On the contrary, it is conducive to transition of alloying elements.
2. Preheating temperature and slow cooling conditions determine quality of the surfacing layer.
3. Different heat treatment methods can make some deposited metal have different degrees of hardness.
4. Hardness and chemical composition of the surfacing layer refer to those of deposited metal that is subject to more than three layers of surfacing.

Concise table of surfacing welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Deposited metal	Hardness of the surfacing layer	Main purpose
153	D102	EDPMn2-03	Titaniumcalcium type	AC-DC	1Mn3	HB ≥ 220	Normal-temperature low-hardness surfacing
154	D106	EDPMn2-16	Low hydrogen type	AC-DC	1Mn3	HB ≥ 220	Normal-temperature low-hardness surfacing
155	D107	EDPMn2-15	Low hydrogen type	DCRP	1Mn3	HB ≥ 220	Normal-temperature low-hardness surfacing
156	D112	EDPCrMo-AI-03	Titaniumcalcium type	AC-DC	2Cr1.5Mo	HB ≥ 220	Normal-temperature low-hardness surfacing
157	D126	EDPMn4-16	Low hydrogen type	AC-DC	2Mn4Si	HRC ≥ 28	Normal-temperature mediumhardness surfacing
158	D127	EDPMn4-15	Low hydrogen type	DCRP	2Mn4Si	HRC ≥ 28	Normal-temperature mediumhardness surfacing
159	D132	EDPCrMo-A2-03	Titaniumcalcium type	AC-DC	4Cr2Mo	HRC ≥ 30	Normal-temperature mediumhardness surfacing
160	D167	EDPMn6-15	Low hydrogen type	DCRP	4Mn4Si	HRC ≥ 50	Normal-temperature high-hardness surfacing
161	D172	EDPCrMo-A3-03	Titaniumcalcium type	AC-DC	4Cr2Mo	HRC ≥ 40	Normal-temperature high-hardness surfacing
162	D207	EDPCrMnSi-A-1-15	Low hydrogen type	DCRP	7Mn2Cr3Si	HRC ≥ 50	Normal-temperature high-hardness surfacing
163	D212	EDPCrMo-A4-03	Titaniumcalcium type	AC-DC	5Cr2Mo2	HRC ≥ 50	Normal-temperature high-hardness surfacing
164	D217A	EDPCrMo-A3-15	Low hydrogen type	DCRP	4Cr2Mo2	HRC ≥ 40	Normal-temperature high-hardness surfacing
165	D227	EDPCrMoV-A2-15	Low hydrogen type	DCRP		HRC ≥ 55	It is used for surfacing of wear-resistant parts that are subjected to a certain amount of impact load, such as the grinding surface of the disc cutter of the heading machine
166	D237	EDPCrMoV-A1-15	Low hydrogen type	DCRP		HRC ≥ 50	It is used for surfacing of hydraulic machinery, dredger buckets, and mining parts and machinery subject to sand wear and cavitation damage

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Deposited metal	Hardness of the surfacing layer	Main purpose
167	D256	EDMn-A-16	Low hydrogen type	AC-DC	Mn13	HB ≥ 170	High-manganese steel surfacing
168	D266	EDMn-B-16	Low hydrogen type	AC-DC	Mn13Mo2	HB ≥ 170	High-manganese steel surfacing
169	D276	EDCrMn-B-16	Low hydrogen type	AC-DC	2Mn13Cr13	HB ≥ 210	Cavitation-resistant high-chromium manganese steel surfacing
170	D277	EDCrMn-B-15	Low hydrogen type	DCRP	2Mn13Cr13	HB ≥ 210	Cavitation-resistant high-chromium manganese steel surfacing
171	D286A	Equivalent to EDZCr-C-15	Low hydrogen type	AC-DC	Mn14Mo2	HB ≥ 370	Repair welding and surfacing of railway rails and turnouts
172	D286B		Low hydrogen type	AC-DC	Mn14Ni3	HB ≥ 270	Repair welding and surfacing of railway rails and turnouts
173	D307	EDD-D-15	Low hydrogen type	DCRP	C1Cr4W18V1	HB ≥ 50	Surfacing of the cutting edge of high-speed steel tools
174	D317	EDRCrMoWV-A3-15	Low hydrogen type	DCRP	C1Cr3Mo4W5V2	HRC ≥ 50	Surfacing of cold dies and general cutters
175	D322	EDRCrMoWV-A1-03	Titaniumcalcium type	AC-DC	5Cr5W9Mo2V	HRC ≥ 55	Surfacing of cold dies and general cutters
176	D327	EDRCrMoWV-A1-15	Low hydrogen type	DCRP	5Cr5W9Mo2V	HRC ≥ 55	Surfacing of cold dies and general cutters
177	D337	EDRCrW-15	Low hydrogen type	DCRP	3Cr2W8	HRC ≥ 48	Surfacing of hot forging dies
178	D397	EDRCrMnMo-15	Low hydrogen type	DCRP	5CrMnMo	HRC ≥ 40	Surfacing of hot forging dies
179	D502	EDCr-A1-03	Titaniumcalcium type	AC-DC	1Cr13	HRC ≥ 40	Surfacing of carbon steel or alloy steel shafts and valves used below 450 °C
180	D507	EDCr-A1-15	Low hydrogen type	DCRP	1Cr13	HRC ≥ 40	Surfacing of carbon steel or alloy steel shafts and valves used below 450 °C
181	D507Mo	EDCr-A2-15	Low hydrogen type	DCRP	1Cr13	HRC ≥ 37	Surfacing of the sealing surface of the medium-temperature high-pressure valves used below 510 °C



D102 D106 D107

Conform to GB/T 984-2001 EDP/ Mn2-03
GB/T 984-2001 EDP/ Mn2-16
GB/T 984-2001 EDP/ Mn2-15

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Deposited metal	Hardness of the surfacing layer	Main purpose
181	D507MoNb	EDCr-A1-15	Low hydrogen type	DCRP	1Cr13MoNb	HRC \geq 37	Surfacing of the sealing surface of the medium-/low-pressure valves used below 540 °C
182	D512	EDCr-B-03	Titaniumcalcium type	AC-DC	2Cr13	HRC \geq 45	Surfacing of the sealing surface of the medium-/low-pressure valves used below 540 °C
183	D516MA	EDCrMn-A-16	Low hydrogen type	AC-DC	2Cr13	HRC38-48	Surfacing of medium-/high-pressure valves used below 540 °C
184	D517	EDCr-B-15	Low hydrogen type	DCRP	2Cr13	HRC \geq 45	Surfacing of superheated steam valves and mixer blades
185	D547	EDCrNi-A-15	Low hydrogen type	DCRP	2Cr13	HB270-320	Surfacing of high-pressure valves used below 570 °C
186	D547Mo	EDCrNi-B-15	Low hydrogen type	DCRP	1Cr20N10Si5Mo	HRC \geq 37	Surfacing of high-pressure valves used below 600 °C
187	D557	EDCrNi-C-15	Low hydrogen type	DCRP	1Cr18Ni8Si7	HRC \geq 37	Surfacing of high-pressure valves used below 600 °C
188	D577	EDCrMn-C-15	Low hydrogen type	DCRP	10Cr14Mn14	HRC \geq 28	Surfacing of medium-temperature high-pressure valves used below 510 °C
189	D608	EDZ-A1-08	Graphite type	AC-DC	C4Cr3Mo3	HRC \geq 55	Surfacing of parts that are subject to sand wear and slight impact
190	D628		Graphite type	AC-DC	C3Cr20Mo4	HRC \geq 60	Surfacing of parts require good abrasive wear resistance
191	D667	EDZCr-C-15	Low hydrogen type	DCRP	C3Cr30Ni4	HRC \geq 48	Surfacing of parts resistant to serious wear and cavitation, such as shaft sleeves of cracking pumps
192	D687	EDZCr-D-15	Low hydrogen type	DCRP		HRC \geq 58	It is applied to parts require excellent wear resistance, such as the small shaft of the roller bit, coal hole digger, lifting bucket, crusher roller, pump frame tube and mixer blade
193	D707	Equivalent to EDW-A-15	Low hydrogen type	DCRP	C2W45MnSi4	HRC \geq 60	Surfacing of parts resistant to serious rock wear, such as dredger blades.

Instructions: D102 is common manganese surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. The surfacing arc is stable and slag removal is easy.

D106 is common manganese surfacing welding rod covered with lowhydrogen potassium coating, which can be used under AC and DC. In addition, no-load voltage shall be greater than 70V when AC power supply is selected. D107 is common manganese surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose: It is used for surfacing or repair welding of surfaces of lowcarbon steel, medium-carbon steel and low-alloy steel wear parts, such as axles, gears and mixer blades.

Chemical composition of deposited metal (%)

Test item	C	Mn
Guarantee value	\leq 0.20	\leq 3.50
Measured value	0.14	3.10

Hardness of the surfacing layer: HB \geq 220

Reference current (D102 AC,DC)(D106 AC,DC⁺)(D107 DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~180	180~220

Precautions:

1 D102 welding rods must be baked at about 250°C for 1h before welding and D106 and D107 welding rods must be baked at 300-350 °C for 1h before welding.

2 Before surfacing of large workpieces, preheat them at about 200°C, and remove rust and oil stain from the surfacing surface.



D112

Conform to GB/T 984-2001 EDP CrMo-A1-03

Instructions: D112 is CrMo surfacing welding rod covered with titanium-calcium coating. It can be used under AC and DC. Arc for surfacing is stable and slag removal is easy.

Purpose: It is used for welding of the surface subject to wear of low carbon steel, medium-carbon steel and low-alloy steel parts, especially suitable for surfacing and repair welding of mining machinery and agricultural machinery.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	Total quantity of other elements
Guarantee value	≤0.25	≤2.00	≤1.50	≤2.00
Measured value	0.18	1.34	0.30	—

Hardness of the surfacing layer: HB≥220

Reference current (AC,DC)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~110	150~180	180~220

Precautions:

1. Welding rods must be baked at about 150°C for 1h before welding.
2. Before surfacing of large workpieces, preheat them to about 200°C, and remove rust and oil stain from the surfacing surface.



D126 D127

Conform to GB/T 984-2001 EDP Mn4-16
GB/T 984-2001 EDP Mn4-15

Instructions: D126 and D127 are common surfacing welding rods covered with low-hydrogen coating. D127 adopts DCRP. D126 can be used under AC and DC (no-load voltage shall be greater than 70V when AC power supply is selected).

Purpose: It is used for surfacing of the surface subject to wear of low carbon steel, medium-carbon steel and low-alloy steel, such as axles, gears, running drive wheels and mixer blades.

Chemical composition of deposited metal (%)

Test item	C	Mn	Total quantity of other elements
Guarantee value	≤0.20	≤4.50	≤2.00
Measured value	0.10	3.80	—

Hardness of the surfacing layer: HRC≥30

Reference current (D126 AC,DC⁺)(D127 DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~120	140~180	180~220

Precautions:

1. Welding rods must be baked at about 300-350°C for 1h before welding.
2. Before surfacing of large workpieces, preheat them to about 300°C, and remove rust and oil stain from the surfacing surface.



D132

Conform to GB/T 984-2001 EDPCrMo-A2-03

Instructions:D132 is CrMo surfacing welding rod covered with titanium-calcium coating. It can be used under AC and DC. Arc for surfacing is stable and slag removal is easy.

Purpose:It is used for welding of the surface subject to wear of lowcarbon steel, medium-carbon steel and low-alloy steel parts, especially suitable for surfacing and repair welding of wear parts of mining machinery and agricultural machinery.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo
Guarantee value	≤0.50	≤3.00	≤1.50
Measured value	0.28	1.96	0.32

Hardness of the surfacing layer: HRC≥30

Reference current (AC,DC)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~130	110~180	150~240

Precautions:

- 1.Welding rods must be baked at about 150 ℃ for 1h before welding.
- 2.Before surfacing of large workpieces, preheat them to about 300 ℃, and remove rust and oil stain from the surfacing surface.



D167

Conform to GB/T 984-2001 EDPMn6-15

Instructions:D167 is MnSi surfacing welding rod covered with lowhydrogen sodium coating, which adopts DCRP.

Purpose:It is used for surfacing of worn parts of agricultural and construction machinery, such as large bulldozers, rollers of power shovels and automobile loop chains.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si
Guarantee value	≤0.45	≤6.50	≤1.00
Measured value	0.30	5.50	0.90

Hardness of the surfacing layer: HRC≥50

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~180	180~220

Precautions:

- 1.Welding rods must be baked at 300-350 ℃ for 1h before welding.
- 2.Large workpieces shall be properly preheated to about 300 ℃ before surfacing, and rust and oil stain on the welding surface shall be removed.



D172

Conform to GB/T 984-2001 EDPCrMo-A3-03

Instructions:D172 is CrMo surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. Arc for surfacing is stable, slag removal is easy and process performance is relatively good.

Purpose:It is used for surfacing of gears, dredger buckets, tractor scrapers, deep-ploughing blade ploughs, mining machinery and other wear parts.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo
Guarantee value	≤0.50	≤2.50	≤2.50
Measured value	0.30	2.15	1.50

Hardness of the surfacing layer: HRC≥40

Reference current (AC,DC)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	150~180	190~230

Precautions:

- 1.Welding rods must be baked at about 150℃ for 1h before welding.
- 2.Large workpieces shall be properly preheated to about 300℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.



D207

Conform to GB/T 984-2001 EDPCrMnSi-A1-15

Instructions: D207 is CrMnSi surfacing welding rod covered with lowhydrogen sodium coating, which adopts DCRP.

Purpose:It is used for surfacing of bulldozer blades, propellers and other wear parts.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Cr	Total quantity of other elements
Guarantee value	0.30-1.00	≤2.50	≤1.00	≤0.035	≤0.035	≤3.50	≤1.00
Measured value	0.52	2.42	0.45	0.007	0.020	3.05	—

Hardness of the surfacing layer: HRC≥50

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~160	180~220

Precautions:

- 1.Welding rods must be baked at about 300-350℃ for 1h before welding.
- 2.Large workpieces shall be properly preheated to about 200℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.



D212

Conform to GB/T 984-2001 EDPCrMo-A4-03
Equivalent to AWS A5.13 EFe15

Instructions:D212 is CrMo surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. Arc for surfacing is stable and slag removal is easy.

Purpose:It is used for single-layer or multi-layer surfacing of the surface of various worn parts such as gears, buckets and mining machinery.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo
Guarantee value	0.30~0.60	≤5.00	≤4.00
Measured value	0.50	3.90	0.35

Hardness of the surfacing layer: HRC≥50

Reference current (AC,DC)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~120	150~180	190~230

Precautions:

1. Welding rods must be baked at about 150 ℃ for 1h before welding.
2. Large workpieces shall be properly preheated to about 300 ℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.



D217A

Conform to GB/T 984-2001 EDPCrMo-A3-15

Instructions:D217A is CrMnMo surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:It is mainly used for surfacing of high-strength wear-resistant parts. Such as surfacing and repair welding of 30CrMnSi and 35CrMnSi metallurgical rollers, and repair welding of parts of ore crushers, 4m³ electric bucket teeth of mine and other excavator dipper teeth.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo
Guarantee value	≤0.50	≤2.50	≤2.50

Hardness of the surfacing layer: HRC≥40

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~180	180~220

Precautions:

1. Welding rods must be baked at about 350-400 ℃ for 1h before welding.
2. Large workpieces shall be preheated to about 200-300 ℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.

**D227**

Conform to GB/T 984-2001 EDPCrMoV-A2-15

Instructions:D227 is surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The surfacing layer is martensitic base with addition of a certain amount of high-hardness carbide. Therefore, the abrasive wear resistance is high, and the deposited metal has good crack resistance.

Purpose:It can be used for surfacing of wear-resistant parts that are subjected to a certain amount of impact load, such as the grinding surface of the disc cutter of the heading machine

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	V
Guarantee value	0.45~0.65	4.00~5.00	2.00~3.00	4.00~5.00
Measured value	0.50	4.53	2.47	4.50

Hardness of the surfacing layer: HRC≥55**Reference current (DC⁺)**

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~180	180~220

Precautions:

- 1.Welding rods must be baked at about 300-350℃ for 1h before welding.
- 2.Large workpieces shall be properly preheated to about 300 ℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.

**D237**

Conform to GB/T 984-2001 EDPCrMoV-A1-15

Instructions:D237 is chromium-molybdenum-vanadium surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:It is used for surfacing of hydraulic machinery, dredger buckets, and mining parts and machinery subject to sand wear and cavitation damage.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	V	Total quantity of other elements
Guarantee value	0.30~0.60	8.00~10.00	≤3.00	0.50~1.00	≤4.00
Measured value	0.35	9.70	0.15	0.65	—

Hardness of the surfacing layer: HRC≥50**Reference current (DC⁺)**

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	90~110	140~180	180~220

Precautions:

- 1.Welding rods must be baked at about 250℃ for 1h before welding.
- 2.Large workpieces shall be properly preheated to about 300 ℃ before surfacing, and rust and oil stain on the surfacing surface shall be removed.



D256

Conform to GB/T 984-2001 EDMn-A-16
Equivalent to AWS A5.13 EFeMn-A

Instructions:D266 is high-manganese steel surfacing welding rod covered with low-hydrogen potassium coating, which can be used under AC and DC (when AC power supply is selected, the no-load voltage shall not be less than 70V). Small current and string bead are preferred for surfacing. In addition, immediate hammering or water quenching when the weldment remains red hot can reduce cracking tendency. The deposited metal is austenitic high-manganese steel, which is characterized by work hardening, toughness and wear resistance.

Purpose:It is applicable to surfacing of various crushers, highmanganese steel rails, buckets and bulldozers that are subject to impact and wear.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Total quantity of other elements
Guarantee value	≤1.10	11.00~16.00	≤1.30	≤5.00
Measured value	0.54	14.00	0.32	—

Hardness of the surfacing layer: HB≥170

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	70~90	100~140	150~180

Precautions:

- 1.Welding rods must be baked at 300-350℃ for 1h before welding.
- 2.Before surfacing of the worn high-manganese steel workpiece, it is necessary to remove the fatigue layer or conduct water toughening or make use of chromium-manganese steel welding rods (such as D277) for backing welding in advance.
- 3.Yellow smoke is very thick during surfacing, so it is necessary to strengthen ventilation and operate standing at the windward position.



D266

Conform to GB/T 984-2001 EDMn-B-16
Equivalent to AWS A5.13 EFeMn-B

Instructions:D266 is high-manganese steel surfacing welding rod covered with low-hydrogen potassium coating, which can be used under AC and DC (when AC power supply is selected, the no-load voltage shall not be less than 70V). Small current and string bead are preferred for surfacing. In addition, immediate hammering or water quenching when the weldment remains red hot can reduce cracking tendency. The deposited metal is austenitic high-manganese steel, which is characterized by work hardening, toughness and wear resistance. Since Mo is added to the weld metal, crack resistance and wear resistance are improved.

Purpose:It is applicable to surfacing of various crushers, highmanganese steel rails, buckets and bulldozers that are subject to impact and wear.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Mo	Total quantity of other elements
Guarantee value	≤1.10	11.00~18.00	≤1.30	≤2.50	≤1.00
Measured value	0.65	14.60	0.75	1.00	

Hardness of the surfacing layer: HB≥170

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	70~90	100~140	150~180

Precautions:

- 1.Welding rods must be baked at 300-350℃ for 1h before welding.
- 2.Before surfacing of the worn high-manganese steel workpiece, it is necessary to remove the fatigue layer or conduct water toughening or make use of chromium-manganese steel welding rods (such as D277) for backing welding in advance.
- 3.Yellow smoke is very thick during surfacing, so it is necessary to strengthen ventilation and operate standing at the windward position.



D276 D277

Conform to GB/T 984-2001 EDCrMn-B-16
Equivalent to GB/T 984-2001 EDCrMn-B-15

Instructions:D276 and D277 are high-chromium manganese steel cavitation-resistant surfacing welding rods covered with low-hydrogen coating, and D277 adopts DCRP. D276 can be used under AC and DC (no-load voltage shall be greater than 70V when AC power supply is selected). The weld metal is characterized by work hardening, high toughness, cavitation resistance, as well as good crack resistance.

Purpose:It is applicable to surfacing of parts of water turbines that are damaged by cavitation, such as guide blades of water turbines, as well as surfacing of high-manganese steel parts requiring high wear resistance and toughness, such as railway turnouts, spiral conveyors, bulldozer blades, grab buckets and crashing cutters.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	Mo	Total quantity of other elements
Guarantee value	≤0.80	11.00-18.00	≤1.30	13.00-17.00	≤2.00	≤2.00	≤4.00
Measured value	0.38	12.65	0.45	14.20	0.050	0.065	—

Hardness of the surfacing layer: HB≥210

Reference current (D276 AC.DC⁺) (D277 DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~80	90~130	130~170	170~220

Precautions:

1. Before surfacing, the welding rod must be baked at 300-350℃ for 1h.
2. Yellow smoke is very thick during surfacing, so it is necessary to strengthen ventilation and operate standing at the windward position.



D286A

Conform to GB/T 984 EDMn-B-16

Instructions:D286A is high-manganese steel manganese-molybdenum surfacing welding rod with low-hydrogen potassium coating, which can be used under AC and DC. The deposited metal is austenite structure, which can be cold processed and hardened after impact and it has good impact and wear resistance, high toughness and good crack resistance.

Purpose:It is applicable to surfacing of high-manganese steel. It is a kind of special welding rod for surfacing repair of railway high-manganese steel rails and turnouts. In addition, it can also be used for surfacing of worn parts on impact surfaces of various crushers and bulldozers.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Mo
Guarantee value	≤0.12	14.00-18.00	≤0.40	≤0.035	≤0.035	1.50-2.50
Measured value	0.10	15.95	0.15	0.003	0.014	2.35

Hardness of the surfacing layer

	As-welded	After hammering	After rolling compaction impact
HB	180~230	370~420	400~500

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	70~90	140~180	150~200

Precautions:

1. Welding rods must be baked at about 350℃ for 1h before welding.
2. In the surfacing process, water for chilling while welding is being performed, and conduct hammering and rolloff impact after welding.



Instructions:D286B is high-manganese steel manganese-nickel surfacing welding rod with low-hydrogen potassium coating, which can be used under AC and DC. The deposited metal is austenite structure, which can be cold processed and hardened after impact and it has good impact and wear resistance, high toughness and good crack resistance.

Purpose:It is applicable to surfacing of high-manganese steel. It is a kind of special welding rod for surfacing repair of railway high-manganese steel rails and turnouts. In addition, it can also be used for surfacing of worn parts on impact surfaces of various crushers and bulldozers.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni
Guarantee value	≤0.12	14.00-18.00	≤0.40	≤0.035	≤0.035	3.00-4.00
Measured value	0.10	17.00	0.14	0.004	0.012	3.48

Hardness of the surfacing layer

	As-welded	After hammering	After rolling compaction impact
HB	180~230	270~320	360~370

Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	70~90	140~180	150~200

Precautions:

1. Welding rods must be baked at about 350 °C for 1h before welding.
2. In the surfacing process, water for chilling while welding is being performed, and conduct hammering and roll-off impact after welding.

Instructions:D307 is surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:Surfacing of knife edge can be performed on the cutter workblank made of medium-carbon steel (such as 45, 45Mn steel) to achieve the purpose of replacing the whole high-speed steel and surfacing repair of worn cutters and other tools is also possible.

Chemical composition of deposited metal (%)

Test item	C	Cr	W	V	S	P	Total quantity of other elements
Guarantee value	0.70-1.00	3.80-4.50	17.00-19.50	1.00-1.50	≤0.035	≤0.040	≤1.50
Measured value	0.85	4.00	19.00	1.35	0.009	0.020	—

Hardness of the surfacing layer: (it is subject to tempering at 540 °C for three times after welding) HRC≥55

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	100~130	130~160	170~220

Precautions:

1. Welding rods must be baked at 300-350 °C for 1h before welding.
2. The small weldment is required to be preheated to 300 °C and the large one is preheated to 600 °C before surfacing.
3. The heat treatment conditions of the surfacing of cutters are the same as those of W18Cr4V high-speed steel.



D317

Conform to GB/T 984 EDRCrMoWV-A3-15



D322

Conform to GB/T 984 EDRCrMoWV-A1-03

Instructions:D317 is CrWVMo die surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:It is applicable to cold die surfacing, as well as surfacing of general cutting tools.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	W	V	S	P	Total quantity of other elements
Guarantee value	0.70-1.00	3.00-4.00	3.00-5.00	4.50-6.00	1.50-3.00	≤0.035	≤0.040	≤1.50

Hardness of the surfacing layer: (Air cooling after welding) HRC≥50

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~120	160~190	190~230

Precautions:

- 1.Welding rods must be baked at 300-350℃ for 1h before welding.
- 2.Preheat the workpiece to above 300℃ before welding to avoid cracking.

Instructions:D322 is CrWVMoV cold die surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. The surfacing arc is stable and slag removal is easy.

Purpose:It is used for surfacing of various cold dies and cutting tools, as well as repair of mechanical parts that require high wear resistance.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	W	V	S	P
Guarantee value	≤0.50	≤5.00	≤2.50	7.00-10.00	≤1.00	≤0.035	≤0.040
Measured value	0.34	3.65	1.53	8.34	0.56	0.012	0.027

Hardness of the surfacing layer: (Air cooling after welding) HRC≥55

Reference current (AC,DC)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~140	160~190	190~230

Precautions:

- 1.Welding rods must be baked at 150℃ for 1h before welding.
- 2.Preheat the workpiece to above 300℃ before welding to avoid cracking.



D327

Conform to GB/T 984 EDRCrMoWV-A1-15

Instructions:D327 is CrWVMo cold die surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:It is used for surfacing of various cold dies and cutting tools, as well as repair of mechanical parts that require high wear resistance.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	W	V	S	P
Guarantee value	≤0.50	≤5.00	≤2.50	7.00-10.00	≤1.00	≤0.035	≤0.040

Hardness of the surfacing layer: (Air cooling after welding) HRC≥55

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	100~130	130~160	170~220

Precautions:

- 1.Welding rods must be baked at 300-350℃ for 1h before welding.
- 2.Preheat the workpiece to above 300℃ before welding to avoid cracking.



D337

Conform to GB/T 984 EDRCrW-15

Instructions:D337 is CrW hot forging die surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP.

Purpose:It is used for surfacing of forging dies on cast steel or forged steel, and repair of forging dies.

Chemical composition of deposited metal (%)

Test item	C	Cr	W	S	P	Total quantity of other elements
Guarantee value	0.25-0.55	2.00-3.50	7.00-10.00	≤0.035	≤0.040	≤1.00
Measured value	0.35	2.65	8.50	0.010	0.015	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥48

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~110	150~180	180~210

Precautions:

- 1.Welding rods must be baked at 300-350℃ for 1h before welding.
- 2.Preheating of the workpiece to above 300-400℃ before welding and slow cooling after welding are necessary.



D397

Conform to GB/T 984 EDRCrMnMo-15



D502

Conform to GB/T 984 EDCr-A1-03

Instructions:D397 is CrMnMo hot forging surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The surfacing layer structure is martensite + retained austenite, which has resistance to intermetallic wear and abrasive wear.

Purpose:It is used for surfacing of hot forging dies of which cast steel or forged steel is used as the green body, as well as repair of old forging dies made of 5CrMnMo, 5CrNiMo and 5CrNiSiW steel, or surfacing of highstrength wear-resistant parts.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Mo	S	P
Guarantee value	≤0.60	≤2.50	≤1.00	≤2.00	≤1.00	≤0.035	≤0.040
Measured value	0.40	1.70	0.43	1.65	0.50	0.007	0.018

Hardness of the surfacing layer: (Air cooling after welding) HRC≥40

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	100~120	140~190	190~210

Precautions:

1. Welding rods must be baked at about 300℃ for 1h before welding.
2. Preheating of the workpiece to above 250℃ before welding and slow cooling after welding are necessary.

Instructions:D502 is 1Cr13 valve surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. Its welding process is good. The deposited metal is 1Cr13 semi-ferritic highchromium steel. The surfacing layer has air-quenching feature and generally does not require heat treatment. Its hardness is uniform, and it can be annealed and softened at 750-800℃. After being heated to 900-1000℃ followed by air cooling or oil quenching, it can be hardened again.

Purpose:This is a kind of universal welding rod for surfacing, and it is used for surfacing of shafts and valves made of carbon steel or alloy steel whose working temperature is below 450℃.

Chemical composition of deposited metal (%)

Test item	C	Cr	S	P	Total quantity of other elements
Guarantee value	≤0.15	10.00-16.00	≤0.030	≤0.040	≤2.50
Measured value	0.15	11.20	0.008	0.024	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥40

Reference current (AC,DC)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	50~80	80~120	120~160	160~200

Precautions:

1. Welding rods must be baked at about 150℃ for 1h before welding.
2. Before welding, the workpiece needs to be preheated to above 300℃. After welding, different heat treatments will bring corresponding hardness.



D507

Conform to GB/T 984 EDCr-A1-15

Instructions:D507 is 1Cr13 valve surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The deposited metal is 1Cr13 semi-ferritic high-chromium steel. The surfacing layer has airquenching feature and generally does not require heat treatment. Its hardness is uniform, and it can be annealed and softened at 750-800 C . After being heated to 900-1000 C followed by air cooling or oil quenching, it can be hardened again.

Purpose:This is a kind of universal welding rod for surfacing, and it is used for surfacing of shafts and valves made of carbon steel or alloy steel whose working temperature is below 450 C .

Chemical composition of deposited metal (%)

Test item	C	Cr	S	P	Total quantity of other elements
Guarantee value	≤0.15	10.00-16.00	≤0.030	≤0.040	≤2.50
Measured value	0.13	13.34	0.006	0.022	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥40

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

1. Welding rods must be baked at 300 C for 1h before welding.
2. Before welding, the workpiece needs to be preheated to above 300 C . After welding, different heat treatments will bring corresponding hardness.



D507Mo

Conform to GB/T 984 EDCr-A2-15

Instructions:D507Mo is 1Cr13 valve surfacing welding rod covered with low-hydrogen sodium coating. The deposited metal is 1Cr13 semiferritic high-chromium steel. The surfacing layer has air quenching feature, and the deposited metal has high medium temperature hardness, good thermal stability and erosion resistance. If it is used in conjunction with D577 welding rods, good scuffing resistance can be achieved. The surfacing process is simple, without preheating before welding or treatment after welding, and DCRP is adopted.

Purpose:It is used for surfacing of the sealing surface of mediumtemperature high-pressure stop valves with working temperature below 510 C . For welding of the sealing surface of gate valves, it is necessary to use this model of welding rod together with D577 welding rods (the above two kinds of welding rods are used for the valve seat and the valve clack respectively).

Chemical composition of deposited metal (%)

Test item	C	Cr	Ni	Mo	W	Total quantity of other elements
Guarantee value	≤0.20	10.00-16.00	≤6.00	≤2.50	≤2.00	≤2.50
Measured value	0.14	11.75	3.50	0.45	1.30	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥37 (softening resistance to 510 C)

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

1. Welding rods must be baked at 300 C for 1h before welding.
2. After the surfacing layer is processed, its thickness shall be more than 5mm to ensure hardness and composition stability.



D507MoNb

Equivalent GB/T 984 EDCr-A1-15



D512

Conform to GB/T 984 EDCr-B-03

Instructions:D507MoNb is 1Cr13 valve surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. Because proper amount of Mo, Nb and other stability strengthening elements is added to the coating, the deposited metal has good oxidation resistance and crack resistance.

Purpose:It is used for surfacing of the sealing surface of medium-/lowpressure valves with working temperature below 450 C .

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	Nb	S	P	Total quantity of other elements
Guarantee value	≤0.15	10.00-16.00	≤2.50	≤0.50	≤0.030	≤0.040	≤2.50
Measured value	0.14	11.80	0.40	0.35	0.009	0.021	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥37

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	160~190

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.The weldment is not preheated before welding and does not require heat treatment after welding.

Instructions: D512 is 2Cr13 valve surfacing welding rod covered with titanium-calcium coating, which can be used under AC and DC. Its welding process is good. The deposited metal is 2Cr13 martensitic highchromium steel. The surfacing layer has air-quenching feature and generally does not require heat treatment. Its hardness is uniform, and it can be annealed and softened at 750-800 C . After being heated to 950- 1000 C followed by air cooling or oil quenching, it can be hardened again.

Purpose:D512 is kind of universal welding rod for surfacing. The surfacing layer is harder and more wear-resistant than that of D502. It is more difficult to process. It is used for surfacing of carbon steel or lowalloy steel shafts, superheated steam valves, mixer blades and spiral conveyor blades.

Chemical composition of deposited metal (%)

Test item	C	Cr	Total quantity of other elements
Guarantee value	≤0.25	10.00~16.00	≤5.00

Hardness of the surfacing layer: (Air cooling after welding) HRC≥45 (softening resistance to 500 C)

Reference current (AC,DC)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	170~210

Precautions:

- 1.Welding rods must be baked at 150℃ for 1h before welding.
- 2.Before welding, the workpiece needs to be preheated to above 300℃ . After welding, different heat treatments will bring corresponding hardness.



D516MA

Conform to GB/T 984 EDCrMn-A-16

Instructions:D516MA is high-chromium manganese steel surfacing welding rod covered with low-hydrogen potassium coating. The surfacing layer metal has good wear resistance, heat resistance, corrosion resistance and hot crack resistance. The welding process is simple, preheating before welding and heat treatment after welding are not required and the surfacing layer allows machining.

Purpose:It is used for surfacing of parts subject to the action of water, steam and petroleum media with the working temperature below 450 °C , such as No. 25 cast steel and the sealing surface of high-/medium pressure valves.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mn	Si
Guarantee value	≤0.25	12.00~14.00	6.00~8.00	≤1.00

Hardness of the surfacing layer: HRC≥30

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

- 1.Welding rods must be baked at 300 °C for 1h before welding.
- 2.Clean oil stain and impurities on the weldment before welding.



D517

Conform to GB/T 984 EDCr-B-15

Instructions:D517 is 2Cr13 valve surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The deposited metal is 2Cr13 martensitic high-chromium steel. The surfacing layer has airquenching feature and generally does not require heat treatment. Its hardness is uniform, and it can be annealed and softened at 750-800 °C . After being heated to 950-1000 °C followed by air cooling or oil quenching, it can be hardened again.

Purpose:It is used for surfacing of carbon steel or low-alloy steel shafts, superheated steam valves, mixer blades and spiral conveyor blades.

Chemical composition of deposited metal (%)

Test item	C	Cr	Total quantity of other elements
Guarantee value	≤0.25	10.00~16.00	≤5.00
Measured value	0.20	13.40	—

Hardness of the surfacing layer: (Air cooling after welding) HRC≥45
(softening resistance to 500 °C)

Reference current (DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	80~120	120~160	170~210

Precautions:

- 1.Welding rods must be baked at 300 °C for 1h before welding.
- 2.Before welding, the workpiece needs to be preheated to above 300 °C . After welding, different heat treatments will bring corresponding hardness.



D547

Conform to GB/T 984 EDCrNi-A-15



D547Mo

Conform to GB/T 984 EDCrNi-B-15

Instructions:D547 is alloy-steel-cored CrNiSi valve surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The deposited metal is strengthened by silicon to obtain austenitic structure with a certain amount of ferrite, which makes it own good scuffing, corrosion and oxidation resistance.

Purpose:It is used for surfacing of the sealing surface of valves of highpressure boiler equipment in power stations with working temperature below 570 C and other sealing parts.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	S	P
Guarantee value	≤0.18	0.60-2.00	4.80-6.40	15.00-18.00	7.00-9.00	≤0.030	≤0.040
Measured value	0.070	1.60	5.40	17.00	8.50	0.004	0.022

Hardness of the surfacing layer: HB 270 - 320

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.For surfacing of medium and small workblanks made of ordinary steel, preheating is not required, while for surfacing of large workpieces or other steel materials, preheating at certain temperature is required and 3-4 surfacing layers are preferred (hardness and chemical composition are stable).

Instructions:D547Mo is CrNiSiMo valve surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. The deposited metal has good high-temperature scuffing and erosion resistance, as well as high high-temperature hardness, good thermal stability and fatigue resistance. The aging strengthening effect of the deposited metal is remarkable, and hardness and scuffing resistance are further improved as the aging time increases.

Purpose:It is used for surfacing of the sealing surface of high-pressure valves with working temperature below 600 C.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	Mo	Nb	S	P	Total quantity of other elements
Guarantee value	≤0.18	0.60-5.00	3.80-6.50	14.00-21.00	6.50-12.00	3.50-7.00	0.50-1.20	≤0.030	≤0.040	≤0.50
Measured value	0.060	1.45	5.60	15.50	10.35	4.50	0.90	0.005	0.020	—

Hardness of the surfacing layer: HRC≥37

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

- 1.Welding rods must be baked at about 300℃ for 1h before welding.
- 2.For surfacing of large workpieces, deep-hole small-caliber stop valve bodies or other steel materials, preheating at certain temperature and slow cooling after welding are required.
- 3.In the surfacing process, it is necessary to continuously weld for 3-4 layers without interruption, and the thickness of the surfacing layer shall be no less than 5mm to ensure stable hardness and chemical composition, but too thick surfacing layers shall be avoided to prevent cracking.

**D557**

Conform to GB/T 984 EDCrNi-C-15

**D577**

Conform to GB/T 984 EDCrMn-C-15

Instructions:D557 is CrNiSi valve surfacing welding rod covered with low-hydrogen sodium coating. The deposited metal is strengthened by a large amount of silicon to obtain austenitic + ferritic structure. With increase in aging time, hardness and scuffing resistance are further improved. The deposited metal has good erosion resistance, oxidation resistance and corrosion resistance, and DCRP is adopted.

Purpose:It is used for surfacing of the sealing surface of high-pressure valves with working temperature below 600 C .

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	S	P
Guarantee value	≤0.20	2.00-3.00	5.00-7.00	18.00-20.00	7.00-10.00	≤0.030	≤0.040

Hardness of the surfacing layer: HRC≥37

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.Due to high hardness of the deposited metal, different preheating temperatures and slow cooling measures are adopted according to the size and shape of the surfacing workpiece. In general, preheating temperature is 300-450℃, and short arc and small current shall be adopted for surfacing as far as possible.

Instructions:D577 is alloy-steel-cored chromium-manganese valve surfacing welding rod covered with low-hydrogen sodium coating. Adopt DCRP. Since the deposited metal is high chromium manganese austenitic steel, the cold hardening effect is remarkable, and it has good scuffing resistance, certain medium-temperature hardness, as well as good thermal stability. When it is used together with D507Mo, excellent scuffing resistance can be obtained. In addition, such welding rods have good crack resistance, welding process is simple, preheating before welding and heat treatment after welding are not required and the deposited metal has good machining performance.

Purpose:It is used for surfacing of the sealing surface of medium temperature high-pressure valves with the working temperature below 510 C . It can be used with D507Mo in the gate valve for longer service life.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	Mo	Total quantity of other elements
Guarantee value	≤1.10	12.00-18.00	≤2.00	12.00-18.00	≤6.00	≤4.00	≤3.00

Hardness of the surfacing layer: HRC≥28

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	120~160	160~200

Precautions:

- 1.Welding rods must be baked at 300℃ for 1h before welding.
- 2.Height of the deposited metal after processing shall be more than 5mm to ensure uniform chemical composition and hardness.



Instructions:D608 is CrMo cast iron surfacing welding rod covered with graphite coating, which can be used under AC and DC but DCRP is preferred. Since the deposited metal is Cr and Mo carbide of cast iron structure, the surfacing layer has high hardness and wear resistance, as well as good resistance to abrasion of sediment and ore.

Purpose:It is used for parts of agricultural machinery and mining equipment that are subject to sand wear and slight impact.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo
Guarantee value	2.50~4.50	3.00~5.00	3.00~5.00
Measured value	3.40	3.56	4.00

Hardness of the surfacing layer: HRC≥55

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~120	130~160	170~210

Precautions:

- 1.Welding rods must be baked at 250℃ for 1h before welding.
- 2.The weldment is preheated at 400-500℃ before surfacing; if surfacing thickness allows, use J507 welding rod to form a surfacing layer first and then proceed with surfacing when the metal is hot. Conduct slow cooling after welding.
- 3.The surfacing layer cannot be machined and can only be ground.



Instructions:D628 is high-carbon, high-chromium cast iron surfacing welding rod covered with graphite coating and resistant to abrasive wear. The surfacing layer is dispersed carbide of high-carbon high-chromium cast iron type, and it has high hardness and good heat resistance, but the surfacing layer is hard and brittle, its ability to withstand pressure and impact load is low. In order not to affect abrasive wear resistance of the surfacing layer, small current shall be adopted as far as possible to facilitate the orientation of hard phase crystallization of the surfacing layer.

Purpose:It is used for surfacing of wearable surfaces that are subject to slight impact load and require good abrasive wear resistance. Such as the hammerhead of the hamper-type coal mill and the impact plate of the fantype coal mill.

Chemical composition of deposited metal (%)

Test item	C	Cr	Mo	V
Guarantee value	3.00~5.00	11.00~20.00	1.00~4.00	≤1.00
Measured value	4.65	15.00	1.74	0.32

Hardness of the surfacing layer: HRC≥60

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~140	130~180	160~210

Precautions:

- 1.Welding rods must be baked at 250℃ for 1h before welding.
- 2.The weldment shall be preheated at 400-600℃ and the workpiece shall be removed of rust and oil stain before surfacing.
- 3.The length of each surfacing shall not exceed 50-70mm.
- 4.After welding, the workpiece shall be tempered at 600-700℃ for 1h and then be slowly cooled, or the workpiece shall be immediately placed in a dry and preheated sand box or grass ash for slow cooling.



D667

Conform to GB/T 984 EDZCr-C-15



D687

Conform to GB/T 984 EDZCr-D-15

Instructions:D667 is high-chromium cast iron surfacing welding rod with cast Solvayite alloy core wire and covered with low-hydrogen sodium coating, which adopts DCRP. The surfacing layer has good wear resistance, corrosion resistance and cavitation resistance below 500 °C , and its hardness drops drastically if above 500 °C .

Purpose:It is used for surfacing of materials require excellent wear, corrosion and cavitation resistance, such as axle sleeve of the centrifugal cracking pump in the petroleum industry, components of mine crushers and valve covers on diesel engines.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	Ni	Total quantity of other elements
Guarantee value	2.50-5.00	≤8.00	1.00-4.80	25.00-32.00	3.00-5.00	≤2.00
Measured value	3.40	3.50	1.67	28.85	3.50	—

Hardness of the surfacing layer: HRC≥48

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0	Φ5.8
Welding current (A)	90~130	120~160	140~190	150~210

Precautions:

- 1.Welding rods must be baked at 300-350 °C for 1h before welding.
- 2.The weldment must be preheated at 500-600 °C , and the oxide on the surface of the workpiece must be brushed clean before surfacing.
- 3.The length of each surfacing shall not exceed 50-70mm.
- 4.After welding, the workpiece shall be tempered at 600-700 °C for 1h and then slowly be cooled, or the workpiece shall be immediately placed in a dry and preheated sand box or grass ash for slow cooling.

Instructions:D687 is high-chromium cast iron surfacing welding rod covered with low-hydrogen sodium coating, which adopts DCRP. It is characterized by stable arc, low spatter, little slag and easy slag removal. In addition, machining of the surfacing layer is hard even by means of alloy cutters and it only allows grinding. The metallographic structure is martensite and coarse complex carbide.

Purpose:It is used in occasions require excellent wear resistance, such as the small shaft of the roller bit, coal hole digger, lifting bucket, crusher roller, pump frame tube and mixer blade.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	Cr	B	Total quantity of other elements
Guarantee value	3.00-4.00	1.50-3.50	≤3.00	22.00-32.00	0.50-2.50	≤6.00
Measured value	3.75	2.30	2.35	29.00	1.20	—

Hardness of the surfacing layer: HRC≥58

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	90~110	140~160	180~220

Precautions:

- 1.Welding rods must be baked at 300-350 °C for 1h before welding.
- 2.The weldment must be preheated at 400-600 °C and the workpiece must be removed of rust and oil stain before surfacing.
- 3.The length of each surfacing shall not exceed 50-70mm.
- 4.After welding, the workpiece shall be tempered at 600-700 °C for 1h and then slowly be cooled, or the workpiece shall be immediately placed in a dry and preheated sand box or grass ash for slow cooling.



Cast iron welding rods

Instructions:D707 is tungsten carbide surfacing welding rod with carbon steel core wire and covered with low-hydrogen sodium coating. It relies on the carbide alloy in the coating for transition and its deposited metal contains 40-50% of tungsten. Because the coating is thick, the sleeve required for welding is long, and the coating turning red is easy to peel off in small pieces, it is better to adopt DCRP and use small current.

Purpose:It is used for surfacing of mechanical parts resistant to serious rock wear, such as blades of concrete mixers, blades of bulldozers and pumps, blades of dredgers and high speed sand mixing boxes.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	W
Guarantee value	1.50~3.00	≤2.00	≤4.00	40.00~50.00

Hardness of the surfacing layer: HRC≥60

Reference current (DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	70~120	140~180	180~220

Precautions:

1. Welding rods must be baked at 300-350 °C for 1h before welding.
2. When the surfacing part is made of carbon steel, the preheating temperature is above 300 °C, when the surfacing part is made of low-alloy steel, it is 400-500 °C and when the surfacing part is made of stainless steel, it is 600-650 °C.
3. Low-alloy steel and stainless steel must be annealed at 700 °C after welding.

Considering cast iron welding rods are high in carbon content, uneven in structure, low in strength, and extremely poor in plasticity, they belong to materials with poor weldability and are prone to cracking during welding. Because cooling speed is extremely fast after welding, the white structure is easily generated, which makes machining difficult.

For welding and repair welding of cast iron, in order to achieve satisfactory results, it is necessary to pay attention to that "material accounts for 30% of importance and process accounts for 70%", which means in addition to selection of appropriate welding rods, selecting the suitable repair welding method is more important.

The following welding processes are recommended as a reference for welding and repair welding of cast iron:

1. First, remove greasy filth, sand, water, rust and other dirt from the part to be welded; For iron castings that are used in high-temperature steam environment for a long time, the surface carbon-depleted layer and oxide layer shall be removed.
2. According to the shape of the welded part and the type of the defect, preparation measures such as bevelling, stop hole drilling and molding of molten bath shall be taken.
3. For workpieces that need cold welding, first preheat them at about 500-600 °C, select suitable current, and allow continuous welding. Maintain the preheating temperature during the whole welding process and after welding, immediately cover them with asbestos or other insulation materials so that they can slowly cooled to improve their crack resistance and processing performance.
4. For cold welding workpieces, prevent excessive melting of the base metal, reduce the tendency of turning white, prevent excessive heat concentration, which may cause excessive stress, and adopt small current, short arc and string bead as far as possible (the length of each weld pass is generally not more than 50mm). Hammer the weld joint immediately after welding so as to relieve the stress to prevent cracking, and weld for another pass after temperature drops below 60 °C.
5. Ensure that the crater is full before extinguishing the arc so as to prevent cracking at the part of arc extinguishing.



Concise table of cast iron welding rods

Page	Model of welding rod	National standard model	Type of coating	Power supply for welding	Main purpose
194	Z208	EZC	Graphite type	AC-DC	It is used for repair welding of defects of gray iron castings
195	Z238	EZCQ	Graphite type	AC-DC	It is used for repair welding of spheroidal graphite castings
196	Z308	EZNI-1	Graphite type	AC-DC	It is used for repair welding of defects of thin-walled castings or machined surface castings
197	Z408	EZNIFe-1	Graphite type	AC-DC	It is used for repair welding of important high-strength gray castings and spheroidal graphite castings
198	Z508	EZNICu-1	Graphite type	AC-DC	It is used for repair welding of gray castings with low strength requirements

Instructions:Z208 is low-carbon steel-cored cast iron welding rod covered with strong graphitized coating. The weld joint can turn into gray cast iron during slow cooling, and crack resistance is poor. It can be used under AC and DC and its price is low.

Purpose:It is used for repair welding of defects of gray cast iron.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Fe
Guarantee value	2.00-4.00	≤0.75	2.50-6.50	≤0.10	≤0.15	Allowance
Measured value	2.30	0.38	4.50	0.003	0.020	—

Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	70~120	110~180	160~190

Precautions:

1. Welding rods must be baked at about 150℃ for 1h before welding.
2. This welding rod is not suitable for important casting structures subject to stress and impact.
3. For defects of parts with low rigidity of the small thin-walled castings, preheating may not be conducted before repair welding, while generally, weldments need to be preheated to 400℃ and conduct heat preservation and slow cooling after welding. In addition, machining may be required for the part subject to repair welding.



Z238

Conform to GB/T 10044 EZCQ
ISO 1071-E C Z



Z308

Conform to GB/T 10044 EZNi-1
AWS A5.15 ENi-CI
Equivalent to ISO 1071-E C Ni-CI 1

Instructions:Z238 is low-carbon steel-cored spheroidal graphite cast iron welding rod covered with strong graphitized coating. Due to addition of a certain amount of nodulizer, the graphite in the deposited metal is spherically precipitated during the cold process, and it can be used under AC and DC.

Purpose:It is used for repair welding of spheroidal graphite iron castings.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Fe	Nodulizer	Total quantity of other elements
Guarantee value	3.20-4.20	≤0.80	3.20-4.00	≤0.10	≤0.15	Allowance	0.04-0.15	≤1.00

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	80~120	130~170	160~190

Precautions:

- 1.Welding rods must be baked at about 250℃ for 1h before welding.
- 2.Before welding, the weldment shall be preheated to about 500℃. After welding, maintain temperature and cool slowly. In addition, machining may be required for the part subject to repair welding.
- 3.Heat treatment specification:
Normalizing treatment: Maintain temperature at 900-920℃ for 2.5h, and the furnace is cooled to 730-750℃ for heat preservation for 2h before taking it out for air cooling.
Annealing treatment: Maintain temperature at 900-920℃ for 2.5h, and the furnace is cooled to below 100℃.

Instructions:Z308 is cast iron welding rod with pure-nickel core wire and covered with strong reducing graphite coating. Preheating of the weldment is not necessary before welding and this model of welding rod has good crack resistance and processing performance. Nickel is expensive and therefore, this model of welding rod shall be selected when other welding rods are unable to satisfy requirements. It can be used under AC and DC.

Purpose:It is used for repair welding of thin iron castings and machined surfaces, such as engine bearers, machine tool slide guides, pinion stands and other important gray iron castings.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	Ni	Fe	Total quantity of other elements
Guarantee value	≤2.00	≤1.00	≤2.50	≤0.030	≥90	≤8.00	≤1.00
Measured value	1.45	0.85	1.80	0.003	93.20	2.00	—

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	50~100	70~120	110~180	160~190

Precautions:

- 1.Welding rods must be baked at about 150℃ for 1h before welding.
- 2.Stress in the repair welding zone can be eliminated by hammering the weld joint to avoid cracking.



Z408

Conform to GB/T 10044 EZNiFe-1
AWS A5.15 ENiFe-CI
ISO 1071-E C NiFe-CI 1



Z508

Conform to GB/T 10044-2006 EZNiCu-1
AWS A5.15 ENiCu-B
ISO 1071-E C NiCu-B

Instructions:Z408 is cast iron welding rod with nickel-iron alloy core wire and covered with strong reducing graphite coating, which is characterized by high strength, good plasticity and low coefficient of linear expansion. Crack resistance is similar to that of Z308 for gray cast iron, but it is stronger than that of Z308 for spheroidal graphite cast iron. In addition, for cast iron with high phosphorus content (0.2% of P), it also has good effect. Its machinability is slightly worse than that of Z308 and Z508. It is used for welding of gray cast iron and spheroidal graphite cast iron used at normal temperature or slightly preheated (to about 200℃). It can be used under AC and DC.

Purpose:It is applicable to repair welding of important high-strength gray castings and spheroidal graphite castings. Such as cylinders, engine bearers, gears and rollers.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	Ni	Cu	Al	Fe	Total quantity of other elements
Guarantee value	≤2.00	≤2.50	≤4.00	≤0.030	45-60	≤2.50	≤1.00	Allowance	≤1.00
Measured value	1.50	0.20	1.80	0.002	51.50	0.016	0.40	—	—

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	70~120	110~180	160~190

Precautions:

Welding rods must be baked at about 150℃ for 1h before welding.

Instructions:Z508 is cast iron welding rod with nickel-copper alloy (monel) core wire and covered with strong reducing graphite coating. Its process performance and machinability are close to those of Z308, but its crack resistance is poor due to its large shrinkage. The welded joint has low strength, so it is not suitable for welding of the stress-bearing part. It can be used for welding of gray cast iron used at normal temperature or subjected to low-temperature preheating (to about 300℃). It can be used under AC and DC.

Purpose:It is used for repair welding of gray castings with low strength requirements

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	Ni	Fe	Cu	Total quantity of other elements
Guarantee value	0.35-0.55	≤2.30	≤0.75	≤0.025	60-70	3.0-6.0	25-35	≤1.00

Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	50~100	70~120	110~170	140~190

Precautions:

- 1.Welding rods must be baked at about 150℃ for 1h before welding.
- 2.In the welding process, string bead is preferred and the length of each weld joint shall not exceed 50mm. In addition, it is necessary to immediately use a hammer to slightly hammer the welded part after welding, so as to eliminate stress in the repair welding zone and prevent cracking.



Special welding rods for pipeline welding

Special welding rods for pipeline welding are series of welding materials developed for national long-distance pipeline transportation projects such as oil transportation, gas transmission and water transportation.

The cellulose content in the coating of the high-cellulose welding rod is high, arc is stable, and the organic matter is decomposed in the arc area during welding to generate a large amount of gas to protect the deposited metal. The arc has powerful blowing force, depth of fusion is deep, penetrating power is strong, single-side welding with back formation is achieved, pore sensitivity is low and melting speed is fast. It is applicable to backing welding of thick-walled containers and the bottom of steel pipes, which can excuse root chipping, improve work efficiency and improve working conditions.

The deposited metal of low-hydrogen welding rods has excellent mechanical properties, the deposition rate of the deposited metal is relatively high and the welding process is good. It is applicable to filling and cosmetic welding of thick-walled containers and steel pipes.



Concise table of special welding rods for pipeline welding

Page	Model of welding rod	National standard model	AWS model	Type of coating	Power supply for welding	Main purpose
199	E6010	E4310	E6010	Cellulose type	DCSP	Downward welding of ring seam of various carbon-steel pipes
200	E6011	E4311	E6011	Cellulose type	AC-DC	Downward welding of ring seam of various carbon-steel pipes
201	E7010	E5010-P1	E7010-P1	Cellulose type	DCSP	Downward welding of ring seam of various carbon steel pipes and alloy steel pipes of the same strength
202	E8010	E5510-P1	E8010-P1	Cellulose type	DCSP	Downward welding of ring seam of various carbon steel pipes and alloy steel pipes of the same strength
203	JQ•J507GX	E5015-G	E7015-G	Low hydrogen type	DCRP	It is used for welding of X60 pipeline steel
204	JQ•J557GX	E5515-G	E8015-G	Low hydrogen type	DCRP	It is used for welding of X65 and X70 pipeline steel
205	JQ•J708GX	E6918-G	E10018-G	Low hydrogen type	DCRP	It is used for welding of X80 pipeline steel
206	J507XG	E5015	E7015	Low hydrogen type	DCRP	Downward welding of ring seam of various carbon steel pipes and low-alloy steel pipes of the same strength
207	J507FeXG	E5048	E7048	Low hydrogen type	DCRP	Downward welding of ring seam of various carbon steel pipes and low-alloy steel pipes of the same strength, the efficiency is relatively high
208	J556FeXG	E5518-G	E8018-G	Low hydrogen type	AC-DC	Welding of ring seam of carbon steel pipes and low-alloy steel pipes of the same strength, the efficiency is relatively high



E6010

Conform to GB/T 5117 E4310
AWS A5.1 E6010
ISO 2560-B-E 43 10 A

Instructions:E6010 is welding rod covered with high cellulose sodium coating for vertical downward welding. It is characterized by arc with powerful blowing force, single-side welding with back formation, little slag, easy slag removal, beautiful weld joint appearance and fast welding speed. Its deposited metal has good mechanical properties, as well as excellent anti-porosity and crack resistance. It is special welding rod for vertical downward welding of ring seam of on-site pipeline in any position and DCSP is adopted.

Purpose:It is used for butt welding of ring seam of various carbon steel pipes, as well as vertical downward welding of general carbon steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.11	0.38	0.10	0.009	0.013	0.085	0.030	0.023	0.008

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥430	≥330	≥20	≥27
Measured value	510	400	27	80

X-ray radiographic inspection requirements: Level II

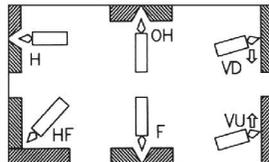
Reference current (DC⁻)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	80~100	110~130

Precautions:

1. Welding rods shall be put into use once the package is opened, not requiring baking.
2. The weldment must be cleaned of rust, oil stain, water and other impurities.
3. Avoid too large current and too wide welding rod swing in the welding process.

Welding position



E6011

Conform to GB/T 5117 E4311
AWS A5.1 E6011

Instructions:E6011 is welding rod covered with high cellulose potassium coating for vertical downward welding. It can be used under AC and DC, arc has powerful blowing force, single-side welding with back formation can be achieved, melting speed is fast, molten bath is clear, slag removal is easy, anti-porosity is excellent and all-position welding is possible.

Purpose:It is used for butt welding of ring seam of various carbon steel pipes, as well as vertical downward welding of general carbon steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤1.00	≤0.035	≤0.040	≤0.30	≤0.20	≤0.30	≤0.08
Measured value	0.12	0.39	0.17	0.014	0.020	0.085	0.036	0.005	0.007

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥430	≥330	≥22	≥27
Measured value	496	400	28.5	50

X-ray radiographic inspection requirements: Level II

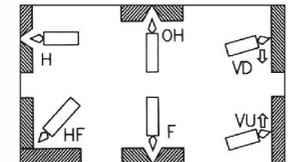
Reference current (AC.DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	80~110	110~140

Precautions:

1. Welding rods shall be put into use once the package is opened, not requiring baking.
2. The weldment must be cleaned of rust, oil stain, water and other impurities.
3. Avoid too large current and too wide welding rod swing in the welding process.

Welding position





E7010

Conform to GB/T 5117 E5010-P1
 Equivalent to AWS A5.5 E7010-P1
 ISO 2560-B-E 49 10-P1 A

Instructions:E7010 is welding rod covered with high cellulose sodium coating for vertical downward welding. It is characterized by arc with powerful blowing force, single-side welding with back formation, little slag, easy slag removal, beautiful weld joint appearance and fast welding speed. Its deposited metal has good mechanical properties, as well as excellent anti-porosity and crack resistance. It is special welding rod for vertical downward welding of ring seam of on-site pipeline in any position and DCSP is adopted.

Purpose:It is used for butt welding of ring seam of various carbon steel pipes, as well as vertical downward welding of general carbon steel structures.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤0.60	≤0.030	≤0.030	≤1.00	≤0.30	≤0.50	≤0.10
Measured value	0.11	0.43	0.10	0.008	0.014	0.35	0.032	0.30	0.009

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥490	≥420	≥20	≥27
Measured value	535	440	24	56

X-ray radiographic inspection requirements: Level II

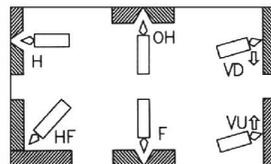
Reference current (DC⁻)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	80~100	110~130

Precautions:

1. Welding rods shall be put into use once the package is opened, not requiring baking.
2. The weldment must be cleaned of rust, oil stain, water and other impurities.
3. Avoid too large current and too wide welding rod swing in the welding process.

Welding position



E8010

Conform to GB/T 5117 E5510-P1
 Equivalent to AWS A5.5 E8010-P1
 ISO 2560-B-E 55 10-P1 A

Instructions:E8010 is welding rods covered with high cellulose sodium coating for vertical downward welding. It is characterized by arc with powerful blowing force, little slag, easy slag removal, beautiful weld joint appearance and fast welding speed. Its deposited metal has good mechanical properties, as well as excellent anti-porosity and crack resistance. It is special welding rod for vertical downward welding of ring seam of on-site pipeline in any position and DCSP is adopted.

Purpose:It is used for filling and cosmetic welding of carbon steel and low-alloy steel pipes of the same strength grade and also suitable for vertical downward welding of structures with the same strength generally.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.20	≤1.20	≤0.60	≤0.030	≤0.030	≤1.00	≤0.30	≤0.50	≤0.10
Measured value	0.10	0.50	0.14	0.010	0.014	0.40	0.035	0.42	0.010

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥550	≥460	≥17	≥27
Measured value	590	500	24	55

X-ray radiographic inspection requirements: Level II

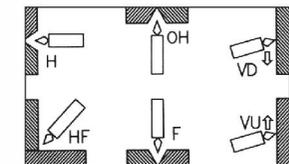
Reference current (DC⁻)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	80~100	110~130

Precautions:

1. Welding rods shall be put into use once the package is opened, not requiring baking.
2. The weldment must be cleaned of rust, oil stain, water and other impurities.
3. Avoid too large current and too wide welding rod swing in the welding process.

Welding position





JQ·J507GX

Conform to GB/T 5117 E5015-G
AWS A5.1 E7015-G

Instructions:JQ·J507GX is welding rod covered with low hydrogen sodium coating and used for pipeline steel. It is characterized by good welding performance, stable and soft arc, low spatter and easy slag removal. Its deposited metal has excellent plasticity, low temperature toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of X60 pipeline steel and other low-alloy steel with comparable strength grade and has higher requirements for sulfur phosphorus and low-temperature toughness.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.020	≤0.030	≤1.00	≤0.20	≤0.30	≤0.08
Measured value	0.086	1.02	0.37	0.014	0.016	0.030	0.045	0.006	0.007

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-30°C
Guarantee value	≥490	≥390	≥22	≥100	≥60
Measured value	570	455	28	180	165

X-ray radiographic inspection requirements: Level I

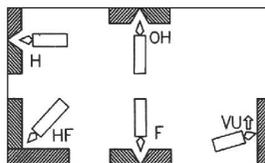
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~130	140~180	170~210

Precautions:

- 1.The welding rods must be baked at about 350-400 °C for 1h before welding. In addition, place them in a thermostat at 100-150 °C and take them out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position



JQ·J557GX

Conform to GB/T 5117 E5515-G
AWS A5.5 E8015-G

Instructions:JQ·J557GX is welding rod covered with low-hydrogen sodium coating and used for pipeline steel. It is characterized by good welding performance, stable and soft arc, low spatter and easy slag removal. Its deposited metal has excellent plasticity, low temperature toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of X65 and X70 pipeline steel and other low-alloy steel with comparable strength grade and has higher requirements for sulfur phosphorus and low-temperature toughness.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.10	≤1.60	≤0.90	≤0.020	≤0.030	≤0.50	≤0.20	≤0.30	≤0.08
Measured value	0.070	1.25	0.28	0.009	0.016	1.20	0.020	0.008	0.001

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-30°C
Guarantee value	≥540	≥440	≥20	≥100	≥60
Measured value	600	500	27	155	145

X-ray radiographic inspection requirements: Level I

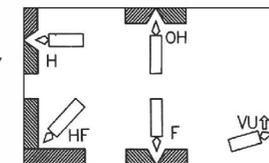
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	60~90	90~130	140~180	170~210

Precautions:

- 1.The welding rods must be baked at about 350-400 °C for 1h before welding. In addition, place them in a thermostat at 100-150 °C and take them out immediately before use.
- 2.The rust, oil stain, water and other impurities of the weldment must be removed before welding.
- 3.Short arc operation is required for welding, and string bead is preferred.

Welding position





Instructions:JQ·J708GX is welding rod covered with low-hydrogen coating and used for pipeline steel. It is characterized by good welding performance, stable and soft arc, low spatter and easy slag removal. Its deposited metal has excellent plasticity, low temperature toughness and crack resistance. Adopt DCRP and all-position welding is possible.

Purpose:It is used for welding of X80 pipeline steel and other low-alloy steel with comparable strength grade and has higher requirements for sulfur phosphorus and low-temperature toughness.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	Cu
Guarantee value	≤0.10	≥1.00	≤0.90	≤0.015	≤0.020	≤2.50	Proper amount	Proper amount	≤0.30

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-30°C
Guarantee value	≥690	≥600	≥16	≥80	≥47

X-ray radiographic inspection requirements: Level I

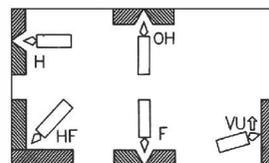
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	60~90	90~130	140~180	170~210

Precautions:

1. The welding rods must be baked at about 350-400 °C for 1h before welding. In addition, place them in a thermostat at 100-150 °C and take them out immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. Short arc operation is required for welding, and string bead is preferred.

Welding position



Instructions:J507XG is carbon-steel welding rod covered with lowhydrogen sodium coating and exclusive for vertical downward welding of pipes. It is characterized by not dripping slag, stable arc with certain blowing force, easy slag removal and smooth welding ripples in the vertical downward welding process. Use DC power supply and connect the welding rod with the positive polarity. It has good mechanical properties and crack resistance.

Purpose:It is applicable to down-vertical welding and down-vertical fillet welding of round pipes with thickness ≤9mm, down-vertical butt groove welding and down-vertical backing welding of round pipes with thickness >9mm.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-30°C
Guarantee value	≥490	≥400	≥20	≥27

Water content of the coating: ≤0.60%

X-ray radiographic inspection requirements: Level I

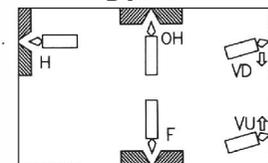
Reference current (DC⁺)

Welding rod diameter (mm)	Φ2.5	Φ3.2	Φ4.0
Welding current (A)	60~100	80~130	110~150

Precautions:

1. Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The welding rod shall be dragged straight down, or it can slightly swing downward in the crescent shape, absolutely forbidding large amplitude of swing.
4. Arc strike must be outside the groove and ensure that the molten bath is full before welding rod manipulation.

Welding position





J507FeXG

Conform to GB/T 5117 E5048

Equivalent to AWS A5.1 E7048



J556FeXG

Conform to GB/T 5117 E5518-G

Equivalent to AWS A5.5 E8018-G

Instructions:J507FeXG is iron powder welding rod covered with low sodium coating and exclusive for pipeline welding. For vertical downward welding, slag does not drip, arc is stable with certain blowing force, slag removal is easy, weld ripples are smooth, and it has good mechanical properties and crack resistance, as well as high deposition efficiency.

Purpose:It is applicable to down-vertical welding of round pipes with thickness ≤9mm, down-vertical fillet welding, down-vertical butt groove welding and down-vertical backing welding of round pipes with thickness >9mm.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	≤1.60	≤0.90	≤0.035	≤0.035	≤0.30	≤0.20	≤0.30	≤0.08

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥490	≥400	≥22	≥27

Water content of the coating: ≤0.60%

X-ray radiographic inspection requirements: Level I

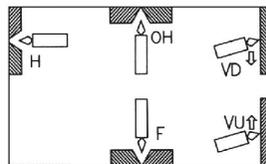
Reference current (DC⁺)

Welding rod diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0
Welding current (A)	60~100	80~130	110~160

Precautions:

1. Welding rods must be baked at 350 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The welding rod shall be dragged straight down, or it can slightly swing downward in the crescent shape, absolutely forbidding large amplitude of swing.
4. Arc strike must be outside the groove and ensure that the molten bath is full before welding rod manipulation.

Welding position



Instructions:J556FeXG is iron powder welding rod covered with low hydrogen potassium coating and exclusive for pipeline welding, which is characterized by not dripping slag in down-vertical welding, stable arc with certain blowing force, relatively easy slag removal, smooth weld ripples, high deposition efficiency, as well as good mechanical properties and crack resistance. It can be used under AC and DC, but DCRP for welding can achieve better effect.

Purpose:It is applicable to filling and cosmetic welding of medium carbon steel pipes and low-alloy steel pipes of corresponding strength grade, as well as down-vertical fillet welding and down-vertical butt groove welding of structural steel of the same grade.

Chemical composition of deposited metal (%)

Test item	C	Mn	Si	S	P
Guarantee value	≤0.12	≤1.60	≤0.90	≤0.030	≤0.030

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥550	≥460	≥17	≥27

Water content of the coating: ≤0.30%

X-ray radiographic inspection requirements: Level I

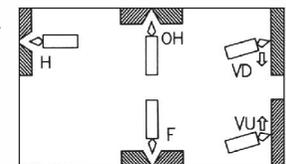
Reference current (AC,DC⁺)

Welding rod diameter (mm)	Φ 3.2	Φ 4.0
Welding current (A)	80~130	110~160

Precautions:

1. Welding rods must be baked at 350-400 °C for 1h before welding and they shall be baked immediately before use.
2. The rust, oil stain, water and other impurities of the weldment must be removed before welding.
3. The welding rod shall be dragged straight down, or it can slightly swing downward in the crescent shape.

Welding position





Welding wires

Welding wires manufactured by Golden Bridge are classified into gas-shielded solid welding wires, submerged arc welding wires, CO₂-shielded flux-cored welding wires, self-shielded flux-cored welding wires and argon arc welding wires.

Gas-shielded welding wires

Gas shielded welding is a kind of welding technology developed in the 1950s. It has developed into an important fusion welding method in more than 60 years and is widely applied to various fields such as automotive industry, construction machinery manufacturing, shipbuilding, metallurgical equipment manufacturing, bridges, civil works, petrochemical engineering, boiler and pressure vessel manufacturing and rolling stock.

At present, production and application of gas-shielded welding wires are developing rapidly. In some industrial developed countries, they have accounted for 40-50% of the total amount of welding materials. This kind of welding wires has been popularized in many industries in China and has gradually replaced manual welding rod arc welding. It has the following characteristics:

1. The welding cost is low.
2. The production efficiency is high and the power consumption is low.
3. Operation is easy and all-position welding is possible.
4. The weld joint has extremely low hydrogen content, low nitrogen content and good crack resistance.
5. Deformation after welding is slight.
6. It has wide application range and is suitable for welding of thin, medium and thick plates.

Concise table of non-copper coated welding wire series products

Category		Names of products manufactured by Golden Bridge	National standard model	American standard model
Products of gas shielded series	Carbon steel	JQ•MG50-6N	ER50-6	ER70S-6
		JQ•MG70S-6N	ER50-6	ER70S-6
		JQ•MG49-1N	ER49-1	—
		JQ•MG50-3N	ER50-3	ER70S-3
	High-strength steel	JQ•MG60-GN	ER60-G	ER90S-G
		JQ•MG70-GN	ER70-G	ER100S-G
		JQ•MG80-GN	ER80-G	ER110S-G
	Heat resistant steel	JQ•MG55-B2N	ER55-B2	ER80S-B2
		JQ•MG62-B3N	ER62-B3 (equivalent)	ER90S-B3 (equivalent)
	Weathering resistant steel	JQ•H08MnSiCUCRNiIN	ER44-G	—
JQ•TH500-NQ-IIN		ER50-G	—	
JQ•TH550-NQ-IIN		ER55-1	—	
Products of argon arc series	Carbon steel	JQ•TG50N	ER50-6	ER70S-6
		JQ•ER49-1N	ER49-1	—
	Heat resistant steel	JQ•TGR30-1N	ER55-B2	ER80S-B2
		JQ•TGR40N	ER62-B3 (equivalent)	ER90S-B3 (equivalent)
		JQ•TGR31N	ER55-B2-MnV	—

Concise table of gas-shielded solid welding wires

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
209	JQ•MG49-1	ER49-1	—	Weld low-carbon steel and some low-alloy steel structures
210	JQ•MG50-3	ER50-3	ER70S-3	It is applicable to welding of carbon steel and low-alloy steel
211	JQ•MG50-4	ER50-4	ER70S-4	It is applicable to welding of carbon steel
212	JQ•MG50-6	ER50-6	ER70S-6	Weld low-carbon steel and high-strength steel with tensile strength grade of 500MPa
213	JQ•MG50-6A	ER50-6	ER70S-6	It is used for welding of various structural steel parts of 500MPa grade
214	JQ•MG50-6N	ER50-6	ER70S-6	Non-copper coated environment-friendly gas-shielded solid welding wires are used for welding of low-carbon steel and steel structure of 500MPa
215	JQ•MG70S-6	ER50-6	ER70S-6	It is applicable to welding of structural steel of corresponding strength grade
216	JQ•MG70S-6N	ER50-6	ER70S-6	Non-copper coated environment-friendly gas-shielded solid welding wires are used for welding of low-carbon steel and steel structure of 500MPa
217	JQ•MG50-Ti	ER50-G	ER70S-G	It is suitable for high-speed welding, especially suitable for highcurrent welding
218	JQ•H08MnSiCuCrNi- II	ER44-G	—	It is used for welding of weathering resistant steel of the same strength grade
219	JQ•TH500-NQ- II	TB/T 2374-2008 ER50-G	—	It is used for welding of weathering resistant steel structures with tensile strength grade of 500MPa.
220	JQ•TH550-NQ- II	ER55-1	ER80S-G	Weld weathering resistant steel structures with tensile strength grade of 550MPa.

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
221	JQ•TH650-EW- II	—	—	It is used for welding of weathering resistant steel structures with tensile strength grade of 650MPa.
222	JQ•MG60-G	ER60-G	ER90S-G	Weld high-strength steel with tensile strength grade of 620MPa
223	JQ•MG60-G-1	ER60-G	ER90S-G	Weld high-strength steel with tensile strength grade of 620MPa
224	JQ•MG70-G	ER70-G	ER100S-G	Weld high-strength steel with tensile strength grade of 690MPa
225	JQ•MG70-G-1	ER70-G	ER100S-G	Weld high-strength steel with tensile strength grade of 690MPa
226	JQ•MG80-G	ER80-G	ER110S-G	Weld high-strength steel with tensile strength grade of 79MPa
227	JQ•MG80-G-1	ER80-G	ER110S-G	Weld high-strength steel with tensile strength grade of 790MPa
228	JQ•MG90-G	ER90-G	ER120S-G	It is applicable to welding of high-strength steel structures with welding tensile strength of 890MPa
229	JQ•MG76-G	ER76-G	—	It is applicable to welding of frames of trail hooks of railway locomotive of the same grade strength
230	JQ•MG55-B2	ER55-B2	ER80S-B2	It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with working temperature below 520°C
231	JQ•MG62-B3	Equivalent to ER 62-B3	Equivalent to ER90S-B3	It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with workpiece temperature below 520°C
232	JQ•X70	ER50-G	ER70S-G	It is used for welding of X70 pipeline steel
233	JQ•X80	ER55-G	ER80S-G	It is used for welding of X80 pipeline steel
234	JQ•MG55-Ni1	ER55-Ni1	ER80S-Ni1	It is used for welding of -45°C low-alloy high-strength steel
235	JQ•ER50HIC	ER50-G	ER70S-G	



Concise table of stainless steel gas-shielded solid welding wires

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
236	JQ•MG304	—	—	It is used for welding of 12Cr18Ni9 and 06 Cr19Ni10 stainless steel material structures
237	JQ•MG307	S307	ER307	It is often applied to special occasions where no magnetism is required or to welding of dissimilar steel.
238	JQ•MG307Si	S307Si	—	It is often applied to special occasions where no magnetism is required or to welding of dissimilar steel.
239	JQ•MG308	S308	ER308	It is used for welding of 12Cr18Ni9 and 06Cr19Ni10 stainless steel structures
240	JQ•MG308L	S308L	ER308L	It is used for welding of ultra-low-carbon 022Cr19Ni10 stainless steel structures
241	JQ•MG308LSi	S308LSi	ER308LSi	It is used for welding of ultra-low-carbon 022Cr19Ni10 stainless steel structures
242	JQ•MG309	S309	ER309	It is used for welding of Cr24Ni13 stainless steel structures
243	JQ•MG309L	S309L	ER309L	It is used for welding of ultra-low-carbon 022Cr24Ni13 stainless steel structures
244	JQ•MG309LSi	S309LSi	ER309LSi	It is used for welding of ultra-low-carbon 022Cr24Ni13 stainless steel structures
245	JQ•MG310	S310	ER310	It is used for welding of Cr25Ni20 stainless steel structures
246	JQ•MG316	S316	ER316	It is used for welding of 06Cr17Ni12Mo2 stainless steel structures
247	JQ•MG316L	S316L	ER316L	It is used for welding of ultra-low-carbon 022Cr19Ni12Mo2 stainless steel structures
248	JQ•MG321	S321	ER321	It is used for welding of 07Cr19Ni11Ti stainless steel structures
249	JQ•MG347	S347	ER347	It is used for welding of 07Cr18Ni11Nb stainless steel structures

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
250	JQ•H0Cr19Ni9	—	—	It is used for welding of Cr19Ni9 stainless steel structures
251	JQ•H1Cr18Ni9	—	—	It is used for welding of Cr19Ni9 stainless steel structures
252	JQ•H1Cr18Ni9Ti	—	—	It is used for welding of Cr19Ni11Ti stainless steel structures
253	JQ•MG308LSi-G	—	—	It is used for welding of TCS chromium stainless steel structures of railway vehicles
254	JQ•MG309LSi-G	—	—	It is used for welding of dissimilar steel of railway vehicles
255	JQ•MG410	S410	ER410	It is used for welding of 12Cr13 stainless steel structures
256	JQ•MG430	S430	ER430	It is used for welding of 10Cr17 stainless steel structures
257	JQ•MG2209	S2209	ER2209	It is used for welding of 022Cr22Ni6Mo3N duplex stainless steel structures
258	JQ•MG2594	S2594	ER2594	It is used for welding of 2594 stainless steel and other materials
259	JQ•MG309Mo	S309Mo	ER309Mo	It is used for welding of Cr24Ni13Mo stainless steel structures
260	JQ•MG309MoL	S309LMo	ER309LMo	It is used for welding of ultra-low-carbon 022Cr24Ni13 stainless steel structures
261	JQ•MG317	S317	ER317	It is used for welding of Cr20Ni14Mo3 stainless steel structures
262	JQ•MG317L	S317L	ER317L	It is used for welding of ultra-low-carbon Cr20Ni14Mo3 stainless steel structures
263	JQ•MG385	S385	ER385	It is used for welding of Cr20Ni25Mo4Cu stainless steel structures
264	JQ•MG308LT	S308L	ER308L	It is used for welding of cryogenic 022Cr19Ni10 and other materials
265	JQ•MG316LT	S316L	ER316L	It is used for welding of cryogenic 022Cr17Ni12Mo2 and other materials





JQ·MG49-1

Conform to GB/T 8110 ER49-1
Equivalent to ISO 14341-A-G424C Z

Instruction:JQ.MG49-1 welding wires have excellent welding performance. In the welding process, arc is stable, spatter is low and there is good anti-porosity.

Purpose:Weld low-carbon steel and some low-alloy steel structures.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.11	1.80-2.10	0.65-0.95	≤0.030	≤0.030	≤0.20	≤0.30	≤0.50
Measured value	0.068	1.87	0.81	0.013	0.016	0.024	0.008	0.120

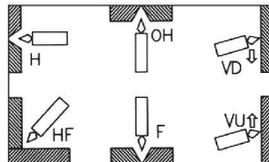
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥490	≥372	≥20	≥47
Measured value	550	450	28.5	78、82、81

Reference current (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position



JQ·MG50-3

Conform to GB/T 8110 ER50-3
AWS A5.18 ER70S-3
Equivalent to JIS YGW16
Conform to ISO 14341-B-GS3

Instruction:JQ.MG50-3 is CO₂-shielded welding wire, which has excellent welding performance, smooth and beautiful weld bead and low welding spatter.

Purpose:1.Welding of low-carbon steel sheets.
2.Welding of low-carbon steel parts subject to relatively thorough surface treatment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.15	0.90-1.40	0.45-0.75	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.074	1.15	0.63	0.021	0.020	0.023	0.021	0.023	0.004	0.12

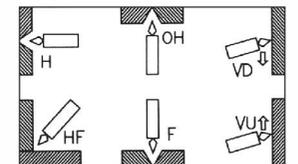
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥500	≥420	≥22	≥27
Measured value	525	430	28	103、97、100

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position





JQ·MG50-4

Conform to GB/T 8110 ER50-4

Conform to ISO 14341-B-GS4
AWS A5.18 ER70S-4

Equivalent to JIS YGW12

Instruction:JQ.MG50-4 welding wires adopt CO₂ or Ar+CO₂ 25%-20% as shielding gas and have excellent welding performance. One-time formability is good. When the argon-rich shielded welding is adopted, the weld bead is exquisite and beautiful.

Purpose:1. Sheet metal welding.
2. Steel pipe welding.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.15	1.00-1.50	0.65-0.85	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.085	1.05	0.718	0.014	0.014	0.005	0.018	0.006	0.003	0.106

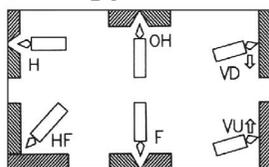
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥500	≥420	≥22	Not required
Measured value	540	450	30	93、87、95

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position



JQ·MG50-6

Conform to GB/T 8110 ER50-6

Conform to ISO 14341-A-G424C13Si1
AWS A5.18 ER70S-6

Equivalent to JIS YGW12

Instruction:Resistance to base metal surface scale and oil contamination is remarkable and pore sensitivity is low.

Purpose:1. Welding of various structural steel parts with tensile strength grade of 500MPa.
2. Welding of various plates and pipes with tensile strength grade of 500MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.15	1.40-1.85	0.80-1.15	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.077	1.45	0.87	0.013	0.012	0.017	0.031	0.002	0.004	0.125

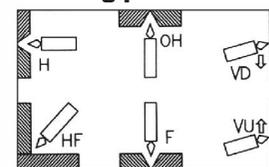
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥500	≥420	≥22	≥47
Measured value	555	450	29	77、95、83

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position





JQ·MG50-6A

Conform to GB/T 8110 ER50-6
 AWS A5.18 ER70S-6
 ISO 14341-A-G424C14Si1
 ISO 14341-A-G464M214Si1
 JIS YGW12

Instruction: Resistance to base metal surface scale and oil contamination is remarkable and pore sensitivity is low.

Purpose: 1. Welding of various structural steel parts with tensile strength grade of 500MPa. 2. Welding of various plates and pipes with tensile strength grade of 500MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.14	1.60-1.85	0.80-1.15	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.350
Measured value	0.075	1.76	0.94	0.012	0.014	0.013	0.010	0.004	0.001	0.12

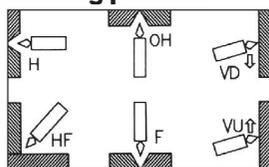
Mechanical properties of deposited metal

Shielding gas	Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
C1	Guarantee value	500-640	≥420	≥22	≥47 (-40°C)
	Measured value	540	432	28	78、79、89
M21	Guarantee value	530-680	≥460	≥22	≥47 (-40°C)
	Measured value	587	495	28.5	82、85、71

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position



JQ·MG50-6N

Conform to GB/T 8110 ER50-6
 ISO 14341-A-G424C13Si1
 AWS A5.18 ER70S-6
 Equivalent to JIS YGW12

Instruction: JQ.MG50-6N is environment-friendly non-copper coated gas-shielded solid welding wire. In the production process, an environment-friendly process treatment free from acid pickling and copper coating is adopted and the outer layer of the welding wire is coated with environment-friendly coating. The welding wire is evaluated from four aspects, including welding spatter, welding fume, wear of the contact tube and rust resistance, and can achieve the technical level of copper-coated welding wires of the same model. Its rust resistance is even better than that of copper-coated welding wires, and during the welding process there is no copper smoke generated, which greatly reduces damage to physical health of operators.

Purpose: It is applicable to welding of base metal with strength grade of 500MPa, and can be applied to steel structure, automobile manufacturing, engineering machinery, bridge, pressure vessel manufacturing and other industries.

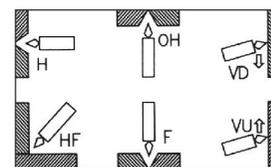
Measured value of chemical composition of welding wire

Items	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.12	1.40-1.85	0.80-1.15	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.20
Measured value	0.077	1.54	0.88	0.011	0.012	0.011	0.025	0.010	0.15

Measured value of mechanical property of deposited metal: (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥500	≥420	≥22	≥47
Measured value	542	446	29	144、134、149

Welding position





JQ·MG70S-6

Conform to GB/T 8110 ER50-6
 Conform to ISO 14341-B-GS6
 AWS A5.18 ER70S-6
 Equivalent to JIS YGW12

Instruction: Resistance to base metal surface scale and oil contamination is remarkable and pore sensitivity is low.

Purpose: It is applicable to welding of structural steel of corresponding strength grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.15	1.40-1.85	0.80-1.15	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.077	1.54	0.92	0.011	0.011	0.006	0.023	0.004	0.002	0.126

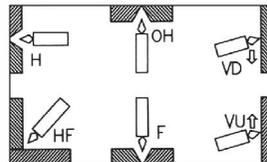
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥500	≥420	≥22	≥27
Measured value	545	445	31	99、91、103

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position



JQ·MG70S-6N

Conform to GB/T 8110 ER50-6
 Conform to ISO 14341-B-GS6
 AWS A5.18 ER70S-6N
 Equivalent to JIS YGW12

Instruction: JQ.MG70S-6N is environment-friendly non-copper coated solid welding wire. In the production process, an environment-friendly process treatment free from acid pickling and copper coating is adopted and the outer layer of the welding wire is coated with environmentfriendly coating. Its product performance is equivalent to copper-coated solid welding wire of the same model.

Purpose: It is applicable to welding of structural steel of corresponding strength grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06-0.15	1.40-1.85	0.80-1.15	≤0.025	≤0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.077	1.54	0.92	0.011	0.011	0.006	0.023	0.004	0.002	0.126

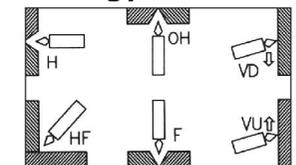
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥500	≥420	≥22	≥27
Measured value	545	445	31	99、91、103

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position





JQ·MG50- Ti

Conform to GB/T 8110 ER50-G
Conform to ISO 14341-B-GS11
AWS ER70S-G
JIS YGW11

Instructions:The welding current is increased to a large extent, and the welding efficiency is improved. Since grains of the deposited metal are refined, its tensile strength and yield strength are both close to the upper limit of welding materials with tensile strength grade of 500MPa specified by the classification society standard. In addition, the impact absorbing energy is remarkably improved.

Purpose:1.Welding of various structural steel parts, thick plates and thick pipelines with tensile strength grade of 500MPa. 2.High-speed welding of various base metals with tensile strength grade of 500MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ti+Zr	Cu
Guarantee value	≤0.15	1.40-1.90	0.55-1.10	≤0.030	≤0.030	≤0.30	≤0.50
Measured value	0.058	1.44	0.73	0.012	0.009	0.17	0.124

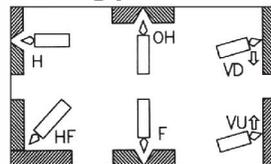
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥500	≥420	≥22	≥27
Measured value	550	455	29	114、131、127

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position



JQ·H08MnSiCuCrNi II

Conform to TB/T 2374 ER 44-G

Instruction:The welding wire has excellent welding performance and the weld bead is exquisite and beautiful. The deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose:It is used for welding of weathering resistant steel structures of corresponding strength grade, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.10	0.90-1.30	0.35-0.65	≤0.025	≤0.025	0.20-0.50	0.20-0.50	0.20-0.50
Measured value	0.057	1.21	0.56	0.008	0.016	0.32	0.31	0.31

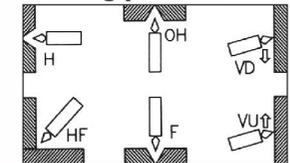
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥440	≥340	≥22	≥60
Measured value	535	450	26	139、121、135

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ0.8	50~100	15
Φ1.0	50~220	15~20
Φ1.2	80~350	15~25
Φ1.6	170~550	20~25

Welding position





Instruction: Adopt argon-rich gas shielding, it has excellent welding performance and the weld bead is exquisite and beautiful. The deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose: It is used for welding of weathering resistant steel structures with tensile strength grade of 500MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.10	0.60-1.20	≤0.60	≤0.020	≤0.025	0.20-0.60	0.30-0.90	0.20-0.50
Measured value	0.057	1.40	0.46	0.008	0.016	0.33	0.48	0.30

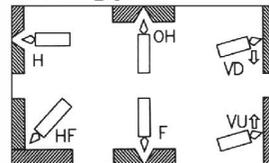
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥500	≥400	≥22	≥60
Measured value	530	435	24	117、102、124

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	CO ₂ gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position



Instruction: Adopt argon-rich gas shielding, it has excellent welding performance and the weld bead is exquisite and beautiful. The deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose: It is used for welding of weathering resistant steel structures with tensile strength grade of 500MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.10	1.20-1.60	≤0.60	≤0.020	≤0.025	0.20-0.60	0.30-0.90	0.20-0.50
Measured value	0.057	1.40	0.46	0.008	0.016	0.33	0.48	0.30

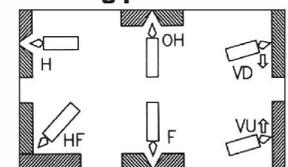
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥550	≥450	≥22	≥60
Measured value	590	495	28	112、120、118

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	Gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position





JQ·TH650EW-Ⅱ

Conform to: Technical conditions for gas-shielded welding wires of high corrosion and weathering resistant steel for railway trucks (provisional)

Instruction: Adopt argon-rich gas shielding, it has excellent welding performance and the weld bead is exquisite and beautiful. The deposited metal has good atmospheric corrosion resistance and crack resistance, as well as good plasticity and toughness.

Purpose: It is used for welding of weathering resistant steel structures with tensile strength grade of 650MPa, such as welding of rolling stock, offshore engineering, bridges and other structures.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.050	≤1.20	≤0.60	≤0.010	≤0.015	3.00-5.00	1.00-2.00	≤0.40
Measured value	0.011	0.59	0.38	0.002	0.006	3.67	1.49	0.21

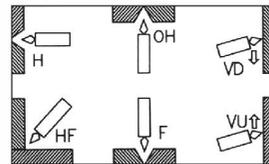
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥650	≥500	≥15	≥34
Measured value	695	610	21	115、120、114

Reference specification (DC⁺)

Welding wire specifications (mm)	Welding current (A)	Gas flow (L/min)
Φ 0.8	50~100	15
Φ 1.0	50~220	15~20
Φ 1.2	80~350	15~25
Φ 1.6	170~550	20~25

Welding position



JQ·MG60-G

Conform to: GB/T 8110 ER60-G, AWS ER90S-G

Instruction: JQ.MG60-G is high-toughness low-alloy steel gas-shielded welding wire of 620MPa grade, which adopts argon-rich gas shielding and has good all-position welding performance.

Purpose: It is applicable to welding of high-strength steel structures with tensile strength grade of 620MPa, such as engineering machinery, pipelines, ships and pressure vessels.

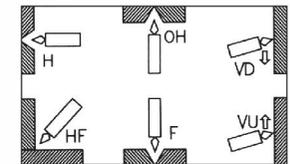
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Mo	Ti	Cu
Guarantee value	≤0.10	1.40-1.90	0.50-0.95	≤0.025	≤0.025	0.20-0.60	≤0.12	≤0.50

Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥620	≥490	≥19	≥47
Measured value	660	545	25	103、111、121

Welding position





JQ·MG60-G-1

Conform to GB/T.8110 ER60-G
AWS ER90S-G

Instruction:JQ.MG60-G-1 is low-alloy steel gas-shielded welding wire of 620MPa grade, which adopts argon-rich gas shielding. Its grains are refined by alloying elements such as Cr and Ti so as to obtain highstrength weld metal and it has good all-position welding performance.

Purpose:It is applicable to welding of high-strength steel structures with tensile strength grade of 620MPa, such as engineering machinery, pipelines, petrochemical engineering, mining machinery and other lowalloy steel.

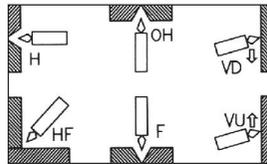
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ti	Cu
Guarantee value	≤0.11	1.40-1.80	0.50-0.90	≤0.025	≤0.025	0.10-0.60	≤0.17	≤0.50

Mechanical properties of deposited metal: (Ar+20% CO2-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥620	≥490	≥19	≥47
Measured value	640	545	22	85、102、109

Welding position



JQ·MG70-G

Conform to GB/T 8110 ER70-G
AWS ER100S-G

Instruction:JQ.MG70-G is NiMoCr high-toughness low-alloy steel gasshielded welding wire of 690MPa grade, which adopts argon-rich gas shielding and has good all-position welding performance. Arc is stable and spatter is low.

Purpose:It is applicable to welding of high-strength steel structures with tensile strength grade of 690MPa, such as engineering machinery, lifting machinery, ships, bridges, pipelines and pressure vessels.

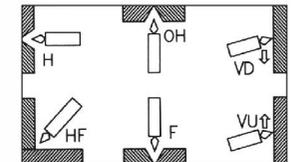
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Ti	Cr	Cu
Guarantee value	≤0.11	1.40-1.90	≤0.80	≤0.025	≤0.025	0.50-1.55	0.20-0.60	≤0.16	≤0.30	≤0.50

Mechanical properties of deposited metal: (Ar+20% CO2-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥690	≥610	≥16	≥27
Measured value	740	645	23	121、128、126

Welding position





JQ·MG70-G-1

Conform to GB/T 8110 ER70-G
Conform to AWS ER100S-G

Instruction:JQ.MG70-G-1 is low-alloy steel gas-shielded welding wire of 690MPa grade, which adopts argon-rich gas shielding. The content of S and P is strictly controlled in order to make the weld joint have excellent comprehensive mechanical properties. The weld joint appearance is flat and beautiful.

Purpose:It is applicable to welding of high-strength steel structures with tensile strength grade of 690MPa, such as engineering machinery, lifting machinery, ships, bridges and pipelines.

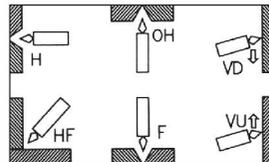
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Ti	Cu
Guarantee value	≤0.11	1.40-1.80	0.40-0.80	≤0.025	≤0.025	0.40-1.00	0.20-0.60	≤0.20	≤0.50

Mechanical properties of deposited metal: (Ar+20% CO2-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥690	≥610	≥16	≥27
Measured value	715	640	23	105、104、92

Welding position



JQ·MG80-G

Conform to GB/T 8110 ER80-G
AWS ER110S-G

Instruction:JQ.MG80-G is high-strength gas-shielded welding wire, and the shielding gas can be the mixture of Ar+20% CO₂. The arc is soft, the combustion is stable, and the spatter is low. The weld joint has good low temperature impact toughness.

Purpose:It is suitable for welding of high-strength structures with tensile strength grade of 790MPa. It can be used for welding of important structures such as pressure vessels, engineering machinery, lifting machinery, ships and mining machinery.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Mo	Cu
Guarantee value	≤0.11	1.40-1.85	0.40-1.00	≤0.025	≤0.025	0.25-0.60	1.20-2.40	0.20-0.60	≤0.50

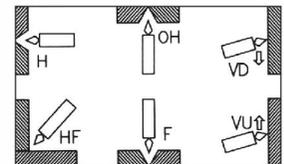
Mechanical properties of deposited metal: (Ar+20% CO2-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Guarantee value	≥790	≥690	≥17	≥27
Measured value	840	730	24.5	85、93、75

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 20-25L/min.
3. Dry elongation length is controlled between 15mm and 20mm.

Welding position





JQ•MG80-G-1

Conform to GB/T 8110 ER80-G
AWS ER110S-G

Instruction:JQ.MG80-G-1 is high-strength gas-shielded welding wire, which adopts argon-rich gas shielding and has good all-position welding performance. The weld joint appearance is flat and beautiful.

Purpose:It is applicable to welding of high-strength steel structures with tensile strength grade of 790MPa, and can be used for welding of important structures, such as engineering machinery, marine engineering, ships, bridges and pipelines.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Ti	Cr	Cu
Guarantee value	≤0.11	1.60-2.00	0.50-0.85	≤0.025	≤0.025	0.70-1.20	0.30-0.70	≤0.10	0.25-0.60	≤0.50

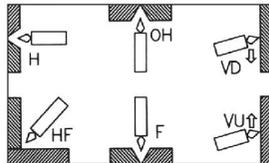
Mechanical properties of deposited metal: (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-40°C
Guarantee value	≥790	≥690	≥17	≥27	
Measured value	820	715	21	73、62、68	

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 20-25L/min.
3. Dry elongation length is controlled between 15mm and 20mm.

Welding position



JQ•MG90-G

Gas-shielded welding wires

Conform to GB/T 8110 ER90-G
Conform to AWS A 5.28 ER120S-G
Equivalent to ISO 16834-A G89 4
M21 Mn4Ni2CrMo

Instruction:JQ.MG90-G is gas-shielded solid welding wire for high strength steel, which adopts argon-rich gas shielding. Arc is soft and welding is stable; The weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of high-strength steel structures with tensile strength grade of 890MPa, such as engineering machinery, lifting machinery and bridges.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Ti	Cu
Guarantee value	≤0.11	1.60-1.90	0.40-0.80	≤0.025	≤0.025	2.00-2.50	0.50-0.80	0.20-0.60	≤0.12	≤0.50

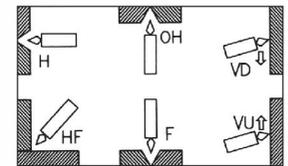
Mechanical properties of deposited metal: (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-40°C
Guarantee value	≥890	≥790	≥15	≥27	≥27
Measured value	954	853	17	88、95、86	67、61、71

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 20-25L/min.
3. Dry elongation length is controlled between 15mm and 20mm.

Welding position





JQ·MG76-G

Conform to GB/T 8110 E R76G
TB/T 3461-2016

Instruction:JQ.MG76-G is low-alloy steel gas-shielded welding wire of 760MPa grade, which adopts argon-rich gas shielding, and the weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of frames of trail hooks of railway locomotive, or high-strength steel structures of corresponding strength grade, such as engineering machinery, lifting machinery, ships, bridges and pipelines.

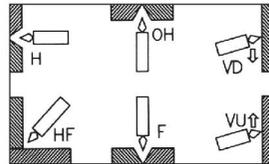
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr
Guarantee value	≤0.12	1.20-2.00	≤0.60	≤0.025	≤0.025	1.20-2.50	0.20-0.80	≤0.50

Mechanical properties of deposited metal: (Ar+20% CO₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥760	≥600	≥20	≥60
Measured value	785	642	22	100、108、94

Welding position



JQ·MG55-B2

Conform to GB/T 8110 E R55-B2
AWS A 5.28 E R80S-B2

Instruction:JQ.MG55-B2 is gas-shielded solid welding wire for heat resistant steel, which adopts mixed gas shielding. Arc is soft and welding is stable; The weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with working temperature below 520°C, such as boiler pipelines, high-pressure vessels and petroleum refining equipment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Cu
Guarantee value	0.07-0.12	0.40-0.70	0.40-0.70	≤0.025	≤0.025	≤0.20	0.40-0.65	1.20-1.50	≤0.35

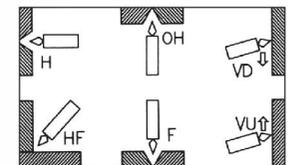
Mechanical properties of deposited metal (Ar+1 - 5% O₂-shielded, heat treatment temperature: 610±15 °C ×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥470	≥19
Measured value	603	512	23

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 20-25L/min.
3. Dry elongation length is controlled between 15mm and 20mm.

Welding position





JQ·MG62-B3

Conform to EN ISO 21952-B G 62A 2C1M3
 Equivalent to GB/T 8110 ER62-B3
 Equivalent to AWS A5.28 ER90S-B3

Instruction:JQ.MG62-B3 is gas-shielded solid welding wire for heat resistant steel. Arc is soft and welding is stable; The weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of Cr2.5Mo heat resistant steel with working temperature below 550°C, such as boiler pipelines, high-temperature high-pressure vessels and petroleum refining equipment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Cu
Guarantee value	0.07-0.12	0.40-0.70	0.40-0.70	≤0.025	≤0.025	≤0.20	0.90-1.20	2.10-2.70	≤0.35

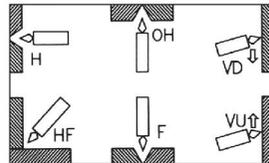
Mechanical properties of deposited metal (Ar+1 - 5% O₂-shielded, heat treatment temperature: 610±15 C ×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥620	≥540	≥17

Precautions:

- 1.Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
- 2.The gas flow during welding is generally 20-25L/min.
- 3.Dry elongation length is controlled between 15mm and 20mm.

Welding position



JQ·X70

Conform to GB/T 8110 ER50-G
 AWS A5.18 ER70S-G

Instruction:JQ.X70 is gas-shielded solid welding wire for pipeline steel, which adopts argon-rich gas shielding. All-position welding is suitable, arc is soft and welding is stable; The weld joint appearance is flat and beautiful and it has excellent welding performance. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of pipeline steel of X70 grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cu
Guarantee value	≤0.12	1.40-1.85	0.80-1.15	≤0.015	≤0.025	≤0.15	≤0.15	≤0.30
Measured value	0.077	1.64	0.88	0.009	0.012	0.025	0.010	0.15

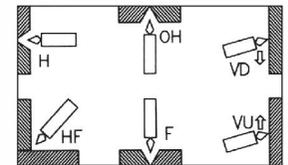
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	(N/mm ²)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	≥550	≥430	≥22	≥47
Measured value	582	456	29	144、134、149

Precautions:

- 1.Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
- 2.The gas flow during welding is generally 20-25L/min.
- 3.Dry elongation length is controlled between 15mm and 20mm.

Welding position





JQ·X80

Conform to GB/T 8110 ER55-G
AWS A5.28 ER80S-G
ISO 14341-A-G504M213Ni1

Instruction:JQ.X80 is gas-shielded solid welding wire for pipeline steel, which adopts argon-rich gas shielding. Arc is soft and welding is stable; The weld joint appearance is flat and beautiful, and it has excellent welding performance and is especially suitable for all-position welding. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of pipeline steel of X80 grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Ti	Cu
Measured value	0.067	1.50	0.62	0.005	0.013	0.65	0.10	0.016	0.12	0.15

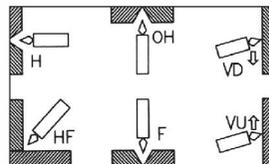
Mechanical properties of deposited metal (Ar+20% CO₂-shielded)

Test item	(N/mm)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
Guarantee value	560~720	≥500	≥18.0	≥60
Measured value	642	551	29.0	138、141、139

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 15-20L/min.
3. Dry elongation length is controlled between 15mm and 20mm.

Welding position



JQ·MG55-Ni1

Conform to GB/T 8110 ER55-Ni1
AWS A5.28 ER80S-Ni1
ISO 14341-A-G 46 5 M G3Ni1
Equivalent to JIS Z 3312 YGWN2

Instruction:JQ.MG55-Ni1 welding wires have excellent welding performance: Arc combustion is stable, spatter is low and the weld joint appearance is beautiful. The weld metal has excellent low temperature impact toughness.

Purpose:It is applied to welding of low-alloy high-strength steel that requires good toughness at low temperature of -45°C.

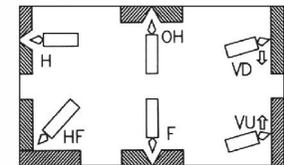
Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	≤0.12	≤1.25	0.40-0.80	≤0.025	≤0.025	0.80-1.10	≤0.15	≤0.35	≤0.05	≤0.35
Measured value	0.06	1.12	0.60	0.007	0.012	1.05	0.01	0.044	0.001	0.11

Mechanical properties of deposited metal (Ar+1.5% O₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -45°C
Guarantee value	≥550	≥470	≥24	≥27
Measured value	575	484	28.5	198、200、210

Welding position





JQ•ER50HIC

Conform to GB/T 8110 ER50-G
AWS A5.18 ER70S-G
NB/T 47018

Instruction:JQ.ER50HIC welding wire is of copper-coated gas-shielded type for hydrogen resistant steel, which is characterized by excellent welding process, pure weld metal, extremely low content of impurities such as S and P, good low temperature toughness and excellent resistance to HIC and SSC.

Purpose:It is mainly used together with Q345R (HIC) steel plates, for welding of crude oil distillation, coking and cracking equipment such as pre-distillation towers, flashing towers, atmospheric towers and stripping towers.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	Cu
Guarantee value	0.06-0.14	1.40-1.60	0.80-1.00	≤0.010	≤0.012	≤0.30	≤0.20	≤0.30	≤0.50
Measured value	0.08	1.51	0.89	0.007	0.010	0.030	0.014	0.01	0.12

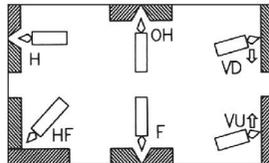
Mechanical properties of deposited metal (Ar+20% CO₂)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C	Thermal treatment
Guarantee value	≥500	≥400	≥22	≥54	—
Measured value	570	473	26	135、127、126	As-welded

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 15-25L/min, which can be adjusted according to the actual situation.
3. Thoroughly clear impurities at the part to be welded, such as oil, rust and water, before welding.

Welding position



JQ•MG304

Instruction:The main composition of the welding wire is 18Cr-8Ni, and it is pure austenitic stainless steel MIG welding wire and allows allposition welding. The deposited metal has low sensitivity to cracks and it is applicable to welding of non-magnetic, high-manganese steel and hardened corrosion-resistant steel. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components as well as containers such as tanks and pipelines, such as SUS304.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S
Guarantee value	≤0.08	≤2.00	≤1.00	18.0-20.0	8.0-10.5	—	≤0.045	≤0.030

Reference current (DC⁺)

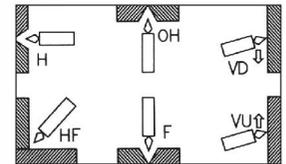
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MG307

Conform to GB/T 29713 S307
AWS A5.9 ER307
ISO 14343-B-SS307

Instruction:The main composition of the welding wire is 18Cr-8Ni-4Mn, and it is pure austenitic stainless steel MIG welding wire and allows allposition welding. The deposited metal has low sensitivity to cracks and it is applicable to welding of non-magnetic, high-manganese steel and hardened corrosion-resistant steel. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to special occasions where no magnetism is required, such as nuclear submarines and armor plates, as well as welding of dissimilar steel that is difficult to be welded and easy to crack.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	0.04-0.14	3.30-4.75	0.30-0.65	19.50-22.00	8.00-10.70	0.50-1.50	≤0.030	≤0.030	≤0.75
Measured value	0.080	4.50	0.43	20.02	9.52	0.97	0.012	0.011	0.18

Reference current (DC +)

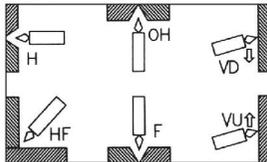
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MG307Si

Conform to GB/T 29713 S307Si

Instruction:The main composition of the welding wire is 18Cr-8Ni-6Mn, and it is pure austenitic stainless steel MIG welding wire and allows allposition welding. The crack sensitivity is low due to high content of Mn, and it is applicable to welding of non-magnetic, high-manganese steel and hardened corrosion-resistant steel. Due to addition of Si, the molten iron has good fluidity, so that the appearance is more beautiful. In addition, wire feeding is smooth, arc is stable and spatter is extremely low.

Purpose:It is often applied to special occasions where no magnetism is required, such as nuclear submarines and armor plates, as well as welding of dissimilar steel that is difficult to be welded and easy to crack.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	0.04-0.14	6.50-8.00	0.65-1.00	18.50-22.00	8.00-10.75	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.071	6.73	0.70	18.83	8.96	0.16	0.014	0.012	0.17

Reference current (DC +)

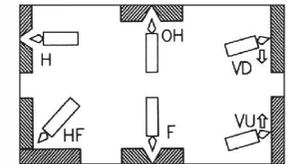
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG308

Conform to GB/T 29713 S308
AWS A5.9 ER308
ISO 14343-B-SS308

Instruction:The main composition of the welding wire is 18Cr-8Ni, and it is the most widely used austenitic stainless steel MIG welding material and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. The deposited metal contains appropriate amount of ferrite, so it has good crack resistance and excellent corrosion resistance.

Purpose:It is widely applied to welding of petrochemical engineering, pressure vessels, food machinery, medical equipment, fertilizer equipment, textile machinery and nuclear reactors, such as 12Cr18Ni9 (SUS 302) and 06Cr19Ni10 (SUS 304).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.08	1.00-2.50	0.30-0.65	19.50-22.00	9.00-11.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.040	1.80	0.31	20.15	9.52	0.43	0.013	0.008	0.34

Reference current (DC +)

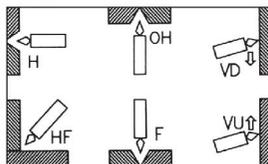
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG308L

Conform to GB/T 29713 S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instruction:The main composition of the welding wire is ultra-low C- 18Cr-8Ni, and it is the most widely used austenitic stainless steel MIG welding material and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. The deposited metal contains appropriate amount of ferrite, so it has good crack resistance and excellent corrosion resistance.

Purpose:It is widely applied to welding of petrochemical engineering, pressure vessels, food machinery, medical equipment, fertilizer equipment, textile machinery and nuclear reactors, such as 022Cr19Ni10(SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.030	1.00-2.50	0.30-0.65	19.50-22.00	9.00-11.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.023	1.63	0.40	20.12	10.35	0.37	0.013	0.009	0.16

Reference current (DC +)

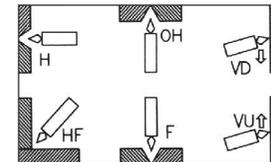
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG308LSi

Conform to GB/T 29713 S308LSi
AWS A5.9 ER308LSi
ISO 14343-A-G 19 9 L Si

Instruction:The main composition of the welding wire is ultra-low C- 18Cr-8Ni, and it is widely used austenitic stainless steel MIG welding material and allows all-position welding. Due to addition of Si, the molten iron has good fluidity, so that the appearance is more beautiful. In addition, wire feeding is smooth, arc is stable and spatter is extremely low.

Purpose:It is widely applied to welding of petrochemical engineering, pressure vessels, food machinery, medical equipment, fertilizer equipment and other related industries, such as 022Cr19Ni10 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.030	1.00-2.50	0.65-1.00	19.50-22.00	9.00-11.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.023	2.20	0.75	19.82	10.54	0.36	0.018	0.011	0.15

Reference current (DC +)

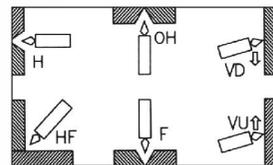
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG309

Conform to GB/T 29713 S309
AWS A5.9 ER309
ISO 14343-A-G 22 12 H

Instruction:The main composition of the welding wire is 22Cr-12Ni, and it is stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. The deposited metal contains ferrite, so it has good crack resistance and excellent corrosion resistance, and high alloy content brings good high temperature resistance.

Purpose:It is often used for welding of carbon steel with dissimilar stainless steel materials or welding of martensitic and pearlitic stainless steel with poor toughness. It is applied to petrochemical engineering, thermal power plants and other industries.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.12	1.00-2.50	0.30-0.65	23.00-25.00	12.00-14.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.081	1.61	0.40	23.85	13.15	0.23	0.012	0.013	0.23

Reference current (DC +)

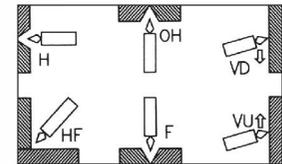
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG309L

Conform to GB/T 29713 S309L
AWS A5.9 ER309L
ISO 14343-A-G 23 12 L

Instruction:The main composition of the welding wire is ultra-low 22Cr-12Ni, and it is stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Since the deposited metal contains appropriate amount of ferrite, it has good crack resistance. High alloy content brings good high temperature resistance; Low carbon content brings excellent corrosion resistance.

Purpose:It is often used for welding of carbon steel with dissimilar stainless steel materials, surfacing of the transition metal for inner wall of reaction vessels in the petrochemical industry, or welding of martensitic and pearlitic stainless steel with poor toughness.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.030	1.00-2.50	0.30-0.65	23.00-25.00	12.00-14.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.021	1.95	0.34	23.90	12.92	0.39	0.012	0.008	0.19

Reference current (DC +)

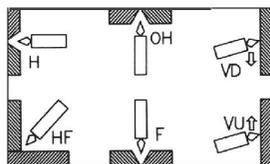
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG309LSi

Conform to GB/T 29713 S309LSi
AWS A5.9 ER309LSi
ISO 14343-A-G 23 12 L Si

Instruction:The main composition of the welding wire is ultra-low C- 23Cr-13Ni, and it is stainless steel MIG welding wire and allows allposition welding. Due to addition of Si, the molten iron has good fluidity, so that the appearance is more beautiful. In addition, wire feeding is smooth, arc is stable and spatter is extremely low. Low carbon content brings excellent corrosion resistance.

Purpose:It is often used for welding of carbon steel with dissimilar stainless steel materials, surfacing of the transition metal for inner wall of reaction vessels in the petrochemical industry, or welding of martensitic and pearlitic stainless steel with poor toughness.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.030	1.00-2.50	0.65-1.00	23.00-25.00	12.00-14.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.021	2.33	0.78	23.93	13.84	0.46	0.012	0.014	0.19

Reference current (DC +)

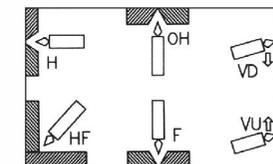
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG310

Conform to GB/T 29713 S310
AWS A5.9 ER310
ISO 14343-AG 25 20

Instruction:The main composition of the welding wire is 25Cr-20Ni, and it is pure austenitic structure stainless steel MIG welding wire and allows all-position welding. Resistance to high temperature is stable and it is able to withstand 1200°C. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to welding of high temperature resistant products such as high temperature furnaces and coal coking equipment, surfacing of the composite layer and welding of dissimilar steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	0.08-0.15	1.00-2.50	0.30-0.65	25.00-28.00	20.00-22.50	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.087	2.00	0.38	27.42	21.82	0.35	0.011	0.009	0.35

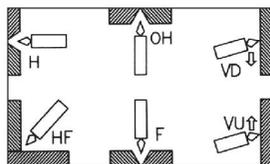
Reference current (DC +)

Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 - 2.Gas flow: 20 - 25L/min.
 - 3.Dry elongation length: 15 - 25mm.
 - 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 - 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG316

Conform to GB/T 29713 S316
AWS A5.9 ER316
ISO 14343-B-S3316

Instruction:The main composition of the welding wire is 18Cr-12Ni-2Mo, and it is stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Mo content makes it have excellent resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 06Cr17Ni12Mo2 (SUS 316).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.08	1.00-2.50	0.30-0.65	18.00-20.00	11.00-14.00	2.00-3.00	≤0.030	≤0.030	≤0.75
Measured value	0.048	1.75	0.45	19.63	12.52	2.50	0.011	0.010	0.26

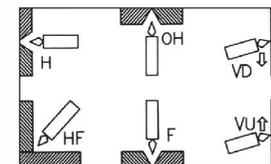
Reference current (DC +)

Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 - 2.Gas flow: 20 - 25L/min.
 - 3.Dry elongation length: 15 - 25mm.
 - 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 - 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG316L

Conform to GB/T 29713 S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo, and it is stainless steel MIG welding wire and allows all position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Mo content makes it have excellent resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 022Cr17Ni12Mo2 (SUS 316L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.030	1.00-2.50	0.30-0.65	18.00-20.00	11.00-14.00	2.00-3.00	≤0.030	≤0.030	≤0.75
Measured value	0.023	1.90	0.42	19.12	12.59	2.59	0.009	0.008	0.28

Reference current (DC +)

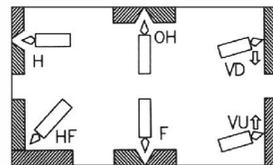
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG321

Conform to GB/T 29713 S321
AWS A5.9 ER321
ISO 14343-B-SS321

Instruction:The main composition of the welding wire is 18Cr-8Ni-Ti, and it is stainless steel MIG welding wire and allows all-position welding. Since Ti is added on the basis of SUS308, corrosion resistance can be effectively improved, and intergranular corrosion resistance is particularly improved. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter!

Purpose:It is often applied to food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions, such as 07Cr19Ni11Ti (SUS 321).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Ti
Guarantee value	≤0.08	1.00-2.50	0.30-0.65	18.50-20.50	9.00-10.50	≤0.75	≤0.030	≤0.030	≤0.75	9×C-1.00
Measured value	0.038	1.54	0.47	19.60	9.76	0.42	0.015	0.009	0.24	0.58

Reference current (DC +)

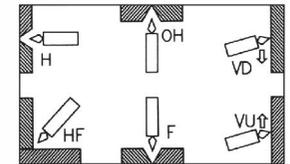
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG347

Conform to GB/T 29713 S347
AWS A5.9 ER347
ISO 14343-A-G 19 9 Nb

Instruction:The main composition of the welding wire is 19Cr-11Ni-Nb, and it is stainless steel MIG welding wire and allows all-position welding. Since Nb is added on the basis of SUS308, corrosion resistance can be effectively improved, and intergranular corrosion resistance is particularly improved. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions, such as 07Cr19Ni11Ti (SUS 321) and 07Cr18Ni11Nb (SUS 347).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Nb
Guarantee value	≤0.08	1.00-2.50	0.30-0.65	19.00-21.50	9.00-11.00	≤0.75	≤0.030	≤0.030	≤0.75	10×C-1.00
Measured value	0.027	1.80	0.40	20.39	9.92	0.44	0.015	0.012	0.33	0.81

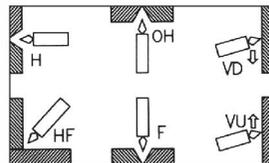
Reference current (DC +)

Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 2. Gas flow: 20 - 25L/min.
 3. Dry elongation length: 15 - 25mm.
 4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·H0Cr19Ni9

Instruction:The main composition of the welding wire is 19Cr-9Ni, and it is stainless steel MIG welding wire, has good weldability and allows all-position welding. It is characterized by smooth wire feeding, stable arc, beautiful appearance, extremely low spatter and deposited metal with excellent corrosion resistance.

Purpose:It is widely applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components as well as containers such as tanks and pipelines, such as 06Cr19Ni10(SUS 304).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Guarantee value	≤0.06	1.00-2.50	0.30-0.65	18.00-20.00	8.00-11.00	≤0.030	≤0.030	≤0.75
Measured value	0.051	1.63	0.51	18.52	8.64	0.024	0.012	0.051

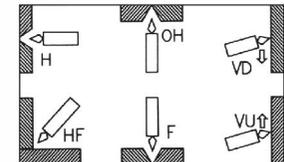
Reference current (DC +)

Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 2. Gas flow: 20 - 25L/min.
 3. Dry elongation length: 15 - 25mm.
 4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•H1Cr18Ni9

Instruction:The main composition of the welding wire is 18Cr-9Ni, and it is stainless steel MIG welding wire and allows all-position welding. It is characterized by smooth wire feeding, stable arc, beautiful appearance and extremely low spatter. The deposited metal is excellent in corrosion resistance.

Purpose:It is widely applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components, such as 12Cr18Ni9 (SUS 302).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Guarantee value	≤0.12	1.00-2.50	0.30-0.65	18.00-20.00	8.00-11.00	≤0.030	≤0.030	≤0.75
Measured value	0.073	1.72	0.58	19.48	8.52	0.024	0.011	0.073

Reference current (DC +)

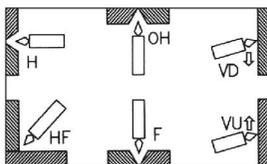
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•H1Cr18Ni9Ti

Instruction:The main composition of the welding wire is 18Cr-9Ni-Ti, and it is stainless steel MIG welding wire and allows all-position welding. Ti content makes it have good corrosion resistance, especially intergranular corrosion resistance. The weldability is good, wire feeding is smooth, arc is stable, appearance is beautiful and spatter is low.

Purpose:It is often used for food machinery, medical equipment, textile printing and dyeing machinery, pressure vessels, petrochemical engineering and other occasions, such as 07Cr19Ni11Ti (SUS 321).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Ti
Guarantee value	≤0.12	1.00-2.50	0.30-0.65	18.00-20.00	8.00-11.00	≤0.030	≤0.030	8×C-1.00
Measured value	0.046	1.81	0.41	19.47	9.57	0.024	0.011	0.55

Reference current (DC +)

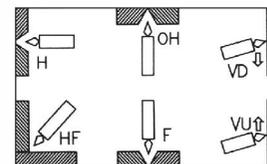
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MG308LSi-G

Conform to TB/T 2374 H00Cr21Ni10Mn2Si
AWS A5.9 ER308LSi
ISO 14343-A-G 199 L Si

Instruction:The main composition of the welding wire is ultra-low C-18Cr-8Ni, and it is a stainless steel MIG welding material and allows allposition welding. Low carbon content makes it excellent in resistance to intergranular corrosion. Because the deposited metal contains appropriate amount of ferrite, its crack sensitivity is low. Wire feeding is smooth, arc is stable and spatter is low; The molten iron has good fluidity and the weld joint appearance is beautiful.

Purpose:It is used for welding of atmospheric corrosion resistant materials such as railway locomotives and truck bodies, such as: 022Cr19Ni10 (SUS 304L) stainless steel and TCS material for delivery trucks.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.03	1.00-2.50	0.60-0.90	19.50-22.00	9.00-11.00	≤0.025	≤0.015
Measured value	0.020	1.89	0.75	19.98	9.57	0.010	0.012

Mechanical properties of deposited metal

Items	Rm (MPa)	A(%)	KV ₂ (J) -40°C	Shielding gas
Guarantee value	≥520	≥35	≥47	Ar+1-5%CO ₂
Measured value	605	41	81	98%Ar+2%CO ₂

Reference current (DC⁺)

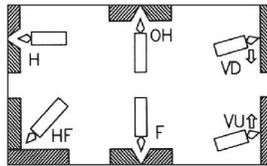
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%CO₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MG309LSi-G

Conform to TB/T 2374 H00Cr23Ni13Mn2Si
AWS A5.9 ER309LSi
ISO 14343-A-G 23 12 L Si

Instruction:The main composition of the welding wire is ultra-low C-23Cr-13Ni, and it is stainless steel MIG welding wire and allows allposition welding. Low carbon content makes it excellent in resistance to intergranular corrosion. Because the deposited metal contains appropriate amount of ferrite, its crack sensitivity is low. Wire feeding is smooth, arc is stable and spatter is low; The molten iron has good fluidity and the weld joint appearance is beautiful.

Purpose:It is used for welding of atmospheric corrosion resistant materials such as railway locomotives and truck bodies, such as TCS materials for delivery trucks, or welding of dissimilar steel such as stainless steel and low carbon steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.030	1.00-2.50	0.60-0.90	22.50-24.50	12.00-14.00	≤0.025	≤0.015
Measured value	0.017	1.93	0.68	23.14	12.40	0.020	0.009

Mechanical properties of deposited metal

Items	Rm (MPa)	A(%)	KV ₂ (J) -40°C	Shielding gas
Guarantee value	≥520	≥30	≥47	Ar+1~5%CO ₂
Measured value	580	39	90	98%Ar+2%CO ₂

Reference current (DC⁺)

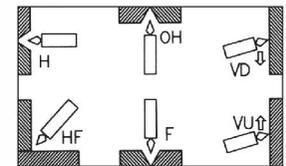
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-5% CO₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG410

Conform to GB/T 29713 S410
AWS A5.9 ER410
ISO 14343-A-G 13

Instruction:The main composition of the welding wire is 13Cr, and it is martensitic stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to wear-resistant and corrosion-resistant occasions such as hydropower stations and valves, such as 12Cr13 (SUS410).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.12	≤0.60	≤0.50	11.50-13.50	≤0.60	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.080	0.41	0.30	11.83	0.19	0.35	0.021	0.011	0.33

Reference current (DC⁺)

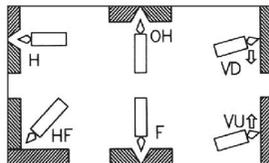
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG430

Conform to GB/T 29713 S430
AWS A5.9 ER430
ISO 14343-A-G 17

Instruction:The main composition of the welding wire is 17Cr, and it is ferritic stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to welding of components at wear-resistant and corrosion-resistant occasions, such as devices, guardrails and golfclub heads made of 10Cr17 (SUS 430).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.10	≤0.60	≤0.50	15.50-17.00	≤0.60	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.035	0.43	0.35	16.39	0.22	0.55	0.012	0.018	0.21

Reference current (DC⁺)

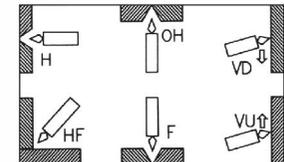
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG630

Conform to GB/T 29713 S630
AWS A5.9 ER630
ISO 14343-B-SS630

Instruction:The main composition of the welding wire is 17Cr-4Ni-4Cu-Nb, and it is precipitation- hardening stainless steel MIG welding wire, and allows all-position welding. Addition of Nb element can effectively improve corrosion resistance, especially resistance to intergranular corrosion. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to welding of similar materials, as well as surfacing and repair welding of parts of the steam turbine's wheel that are resistant to cavitation and abrasion.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Nb
Guarantee value	≤0.05	0.25-0.75	≤0.75	16.00-16.75	4.50-5.00	≤0.75	≤0.030	≤0.030	3.25-4.00	0.16-0.30
Measured value	0.032	0.50	0.32	16.55	4.63	0.45	0.012	0.011	3.40	0.25

Reference current (DC⁺)

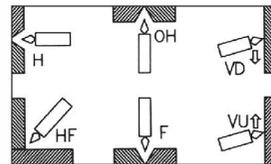
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- Gas flow: 20 - 25L/min.
- Dry elongation length: 15 - 25mm.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG2209

Conform to GB/T 29713 S2209
AWS A5.9 ER2209
ISO 14343-A-G 22 9 3 N L

Instruction:The main composition of the welding wire is 22Cr-9Ni-3Mo-N, and it is austenitic-ferritic duplex stainless steel MIG welding wire and allows all-position welding. Since the deposited metal contains about 40% of ferrite, the deposited metal combines the comprehensive properties of austenitic stainless steel with the stress corrosion resistance of ferritic stainless steel, making it an emerging material applied in the petrochemical industry. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to petrochemical engineering, shipbuilding and other industries, for welding of corresponding steel 022Cr22Ni5Mo3N (SUS 2205).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Nb
Guarantee value	≤0.030	0.50-2.00	≤0.90	21.50-23.50	7.50-9.50	2.50-3.50	≤0.030	≤0.030	≤0.75	0.08-0.20
Measured value	0.023	1.62	0.40	22.5	8.75	3.23	0.011	0.009	0.18	0.16

Reference current (DC⁺)

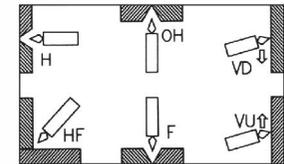
Diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- Gas flow: 20 - 25L/min.
- Dry elongation length: 15 - 25mm.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MG2594

Conform to GB/T 29713 S2594
AWS A5.9 ER2594

Instruction:The welding wire is austenitic-ferritic duplex stainless steel and allows all-position welding. Since the deposited metal contains about 40% of ferrite, the deposited metal combines the comprehensive properties of austenitic stainless steel with the stress corrosion resistance of ferritic stainless steel, making it an emerging material applied in the petrochemical industry. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter.

Purpose:It is often applied to petrochemical engineering, shipbuilding and other industries, for welding of corresponding stainless steel 2594.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	N
Guarantee value	≤ 0.030	≤ 2.50	≤ 1.00	24.00 27.00	8.00 10.50	2.50 4.50	≤ 0.030	≤ 0.020	≤ 1.50	0.20 0.30
Measured value	0.021	2.10	0.56	25.6	9.75	3.25	0.011	0.009	0.15	0.22

Reference current (DC +)

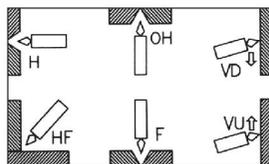
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20 - 25L/min.
- 3.Dry elongation length: 15 - 25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MG309Mo

Conform to GB/T 29713 S309Mo
YB/T 5092 H12Cr24Ni13Mo2
AWS A5.9 ER309Mo
ISO 14343 B-SS309Mo

Instruction:The main composition of the welding wire is 22Cr-12Ni-Mo, which allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Mo content makes it excellent in crack resistance.

Purpose:It is often applied to welding of carbon steel with dissimilar stainless steel materials, welding of martensitic and ferritic stainless steel with poor toughness, and welding of cast steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.12	1.00-2.50	0.30-0.65	23.00-25.00	12.00-14.00	2.00-3.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.085	1.93	0.38	23.54	12.40	2.31	0.009	0.017	0.24

Reference current (DC +)

Welding wire diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20-25L/min.
- 3.Dry elongation length: 15-25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ·MG309MoL

Conform to GB/T 29713 S309LMo
YB/T 5092 H03Cr24Ni13Mo2
AWS A5.9 ER309LMo
ISO 14343 B-SS309LMo

Instruction:The main composition of the welding wire is ultra-low C-22Cr-12Ni-Mo, which allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Mo content makes it excellent in crack resistance.

Purpose:It is often applied to welding of carbon steel with dissimilar stainless steel materials, welding of martensitic and ferritic stainless steel with poor toughness, and welding of cast steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	23.00 25.00	12.00 14.00	2.00 3.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.022	1.92	0.38	23.58	12.80	2.33	0.010	0.015	0.26

Reference current (DC⁺)

Welding wire diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 - 2.Gas flow: 20-25L/min.
 - 3.Dry elongation length: 15-25mm.
 - 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 - 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ·MG317

Conform to GB/T 29713 S317
YB/T 5092 H08Cr19Ni14Mo3
AWS A5.9 ER317
ISO 14343 B-SS317

Instruction:The main composition of the welding wire is 18Cr-12Ni-3Mo, and it is stainless steel MIG welding wire and allows all-position welding. Excellent weldability - smooth wire feeding, stable arc, beautiful appearance and low spatter. Mo content makes it have excellent resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 06Cr17Ni12Mo3 (SUS 317).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.08	1.00-2.50	0.30-0.65	18.50-20.50	13.00-15.00	3.00-4.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.048	1.75	0.45	19.63	13.52	3.54	0.015	0.014	0.26

Reference current (DC⁺)

Welding wire diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
 - 2.Gas flow: 20-25L/min.
 - 3.Dry elongation length: 15-25mm.
 - 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
 - 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ·MG317L

Conform to GB/T 29713 S317L
YB/T 5092 H03Cr19Ni14Mo3
AWS A5.9 ER317L
ISO 14343-B-SS317L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-12Ni-3Mo, which is stainless steel gas-shielded welding wire, and has good resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts due to Mo content. Good weldability - stable arc, beautiful appearance and low spatter. All-position welding is possible.

Purpose:It is used for welding of petrochemical equipment, etc., such as 0Cr19Ni13Mo3 (SUS 317).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	18.50 20.50	13.00 15.00	3.00 4.00	≤ 0.030	≤ 0.030	≤ 0.75

Reference current (DC⁺)

Welding wire diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20-25L/min.
- 3.Dry elongation length: 15-25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ·MG385

Conform to GB/T 29713 S385
YB/T 5092 H02Cr20Ni25Mo4Cu
AWS A5.9 ER385

Instruction:The main composition of the welding wire is 20Cr-25Ni-5Mo-2Cu, which is stainless steel gas-shielded welding wire. It has extremely low carbon content and excellent corrosion resistance; It is resistant to corrosion of acetic acid of any concentration and at any temperature under normal pressure. It can effectively solve the problems of hole corrosion, pitting, crevice corrosion and stress corrosion of halides. Good weldability - stable arc, beautiful appearance and low spatter. All-position welding is possible.

Purpose:It is often applied to production and manufacturing of towers, tanks, pipelines, and storage and transportation containers for various strong acids.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.025	1.00- 2.50	≤ 0.50	19.50 21.50	24.00 26.00	4.20 5.20	≤ 0.020	≤ 0.030	1.20 2.00

Reference current (DC⁺)

Welding wire diameter(mm)	Φ0.8	Φ1.0	Φ1.2
welding current(A)	70~150	100~200	140~220

Precautions:

- 1.Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
- 2.Gas flow: 20-25L/min.
- 3.Dry elongation length: 15-25mm.
- 4.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- 5.For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ•MG308LT

Conform to GB/T 29713 S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-8Ni, and it is the most widely used austenitic stainless steel MIG welding material and allows all-position welding. It has good impact toughness at -196 C, stable arc, beautiful appearance and extremely low spatter. Crack resistance is good and corrosion resistance is excellent.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr19Ni10 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00-2.50	0.30-0.65	19.50-22.00	9.00-11.00	≤ 0.75	≤ 0.025	≤ 0.020	≤ 0.75
Measured value	0.021	1.68	0.45	20.34	10.50	0.32	0.010	0.006	0.10

Reference current (DC +)

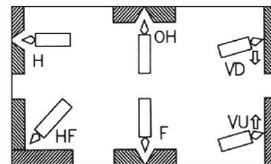
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MG316LT

Conform to GB/T 29713 S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo, and it is stainless steel MIG welding wire and allows all-position welding. It has good impact toughness at -196 C, stable arc, beautiful appearance and extremely low spatter. It has excellent resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr17Ni12Mo2 (SUS 316L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00-2.50	0.30-0.65	18.00-20.00	11.00-14.00	2.00-3.00	≤ 0.020	≤ 0.025	≤ 0.75
Measured value	0.020	1.94	0.45	19.34	12.85	2.61	0.006	0.006	0.25

Reference current (DC +)

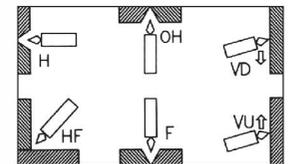
Diameter(mm)	Φ 0.8	Φ 1.0	Φ 1.2
welding current(A)	70~150	100~200	140~220

Precautions:

1. Shielding gas: Pay attention to the purity of shielding gas. The ratio of the mixed gas is recommended to be Ar+1-3%O₂.
2. Gas flow: 20 - 25L/min.
3. Dry elongation length: 15 - 25mm.
4. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
5. For outdoor welding, when the wind speed is greater than 1.5m/s, appropriate windproof measures must be taken to prevent the generation of pores.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





Argon arc welding wire description

The argon arc welding wire is a kind of inert gas shielded welding, which has the following characteristics:

1. Good argon shielding effect brings high-quality weld joints.
2. Arc burning is steady and depth of fusion is shallow, so it is quite suitable for sheet welding.
3. It is easy to operate, all-position welding is possible, and single-side welding with back formation can be achieved.
4. The weld joint appearance is beautiful, free from spatter.

Concise table of argon arc welding wires

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
266	JQ•ER49-1	ER49-1	—	It is suitable for welding of carbon steel, as well as structural steel of 500MPa grade.
267	JQ•TG50	ER50-6	ER70S-6	Weld low-carbon steel and low-alloy steel structures
268	JQ•TGR30-1	ER55-B2	ER80S-B2	It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with working temperature below 520°C
269	JQ•TGR31	ER55-B2-MnV	—	It is applicable to welding of heat resistant steel containing Cr1.25%-Mo0.5% and Cr1.25%-Mo0.5%-V0.2%, with working temperature below 550°C
270	JQ•TG50HR	ER50-6	ER70S-6	It is argon arc welding wire applicable to welding of carbon steel for nuclear power engineering and low alloy steel
271	JQ•TG60HR	ER60-G	ER90S-G	It is applicable to welding of low alloy steel of 600MPa grade used in nuclear power engineering
272	JQ•TGR40	Equivalent to ER62-B3	Equivalent to ER90S-B3	It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with workpiece temperature below 520°C
273	JQ•TG304	—	—	It is used for welding of Cr19Ni9 stainless steel structures
274	JQ•TG308	S308	ER308	It is used for welding of Cr19Ni9 stainless steel structures
275	JQ•TG308L	S308L	ER308L	It is used for welding of ultra-low-carbon 022Cr19Ni10 stainless steel structures
276	JQ•TG309	S309	ER309	It is used for welding of Cr24Ni13 stainless steel structures
277	JQ•TG309L	S309L	ER309L	It is used for welding of ultra-low-carbon 022Cr24Ni13 stainless
278	JQ•TG310	S310	ER310	It is used for welding of Cr26Ni21 stainless steel structures



JQ•ER49-1

Conform to GB/T 8110 ER49-1

Page	Model of welding wire	Model		Main purpose
		GB	AWS	
279	JQ•TG316	S316	ER316	It is used for welding of 06Cr17Ni12Mo2 stainless steel structures
280	JQ•TG316L	S316L	ER316L	It is used for welding of ultra-low-carbon 022Cr17Ni12Mo2 stainless steel structures
281	JQ•TG317	S317	ER317	It is used for welding of Cr20Ni14Mo3 stainless steel structures
282	JQ•TG321	S321	ER321	It is used for welding of Cr19Ni9Ti stainless steel structures
283	JQ•TG347	S347	ER347	It is used for welding of Cr20Ni10Nb stainless steel structures
284	H0Cr19Ni9	—	—	It is used for welding of Cr19Ni9 stainless steel structures
285	H1Cr18Ni9	—	—	It is used for welding of Cr19Ni9 stainless steel structures
286	H1Cr18Ni9Ti	—	—	It is used for welding of Cr19Ni9Ti stainless steel structures
287	JQ•TG410	S410	ER410	It is used for welding of 12Cr13 stainless steel structures
288	JQ•TG430	S430	ER430	It is used for welding of 10Cr17 stainless steel structures
289	JQ•TG2209	S2209	ER2209	It is used for welding of 022Cr22Ni5Mo3N duplex stainless steel structures
290	JQ•TG2594	S2594	ER2594	Welding wires used for welding of 2594
291	JQ•TG308LT	S308L	ER308L	It is used for welding of cryogenic 022Cr19Ni10 and other materials
292	JQ•TG316LT	S316L	ER316L	It is used for welding of cryogenic 022Cr17Ni12Mo2 and other

Instruction:JQ•ER49-1 is carbon-steel argon arc welding wire with excellent plasticity, toughness and crack resistance.

Purpose:It is suitable for welding of carbon steel, as well as structural steel of 500MPa grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Cu
Guarantee value	≤0.11	1.80-2.10	0.65-0.95	≤0.030	≤0.030	≤0.30	≤0.20	≤0.50
Measured value	0.063	1.93	0.79	0.010	0.015	0.007	0.015	0.112

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) Normal temperature
Guarantee value	≥490	≥372	≥20	≥47
Measured value	550	455	78	148、159、147

Welding wire specifications

Diameter (mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.0



Instruction:JQ.TG50 is carbon-steel argon arc welding wire with excellent plasticity, toughness and crack resistance, especially high low temperature impact toughness.

Purpose:It is used for manual tungsten argon arc welding as backing welding and arc welding of pipes at all positions and satisfactory welded joints can be obtained. It can be used for welding of carbon steel and some low alloy steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06 0.15	1.40 1.85	0.80 1.15	≤ 0.025	≤ 0.025	≤0.15	≤0.15	≤0.15	≤0.03	≤0.50
Measured value	0.08	1.49	0.84	0.018	0.018	0.019	0.032	0.004	0.007	0.15

Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Guarantee value	≥490	≥420	≥22	≥27
Measured value	546	467	27	116

Welding wire specifications

Diameter (mm)	Φ 1.0	Φ 1.2	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.0



Instruction:JQ.TGR30-1 is argon arc welding wire used for heat resistant steel. The weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of heat resistant steel containing Cr1%-Mo0.5% with working temperature below 520°C, such as boiler pipelines, high-pressure vessels and petroleum refining equipment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Cu
Guarantee value	0.07 0.12	0.40 0.70	0.40 0.70	≤ 0.025	≤ 0.025	≤0.20	0.40 0.65	1.20 1.50	≤0.35

Mechanical properties of deposited metal (Ar+1-5% O₂-shielded)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥550	≥470	≥19

Welding wire specifications

Diameter (mm)	Φ 1.0	Φ 1.2	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.0



Instruction:JQ.TGR31 is argon arc welding wire used for heat resistant steel. The weld joint appearance is flat and beautiful; Addition of appropriate amount of V to the welding wire makes it have better creep resistance and mechanical properties.

Purpose:It is applicable to welding of heat resistant steel containing Cr1.25%-Mo0.5% and Cr1.25%-Mo0.5%-V0.2%, with working temperature below 550°C, such as boiler pipelines, high-pressure containers and petroleum refining equipment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	V	Cu
Guarantee value	0.06 0.10	1.20 1.60	0.60 0.90	≤ 0.025	≤ 0.025	≤ 0.20	0.50 0.70	1.00 1.30	0.20 0.40	≤0.35
Measured value	0.080	1.33	0.73	0.009	0.014	0.008	0.55	1.18	0.31	0.11

Mechanical properties of deposited metal (730°C × 1h heat treatment)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0°C
Guarantee value	≥550	≥440	≥19	≥27
Measured value	642	548	25	105、99、108

Instruction:JQ.TG50HR is argon arc welding wire used for carbon steel and low alloy steel in the nuclear power engineering. All-position welding is suitable, arc is soft and welding is stable; The weld joint appearance is flat and beautiful and it has excellent welding performance. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is used for nuclear power engineering and applicable to welding of carbon steel and low alloy steel of 500MPa grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cu
Measured value	0.077	1.54	0.88	0.009	0.013	0.025	0.010	0.15

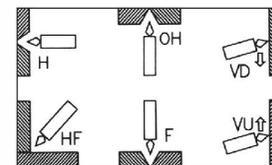
Mechanical properties of deposited metal

Test item	(N/mm ²)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30°C
Measured value	558	462	30	124、114、120

Precautions:

1. Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
2. The gas flow during welding is generally 15-25L/min, which can be adjusted according to the actual situation.
3. Thoroughly clear impurities at the part to be welded, such as oil, rust and water, before welding.

Welding position





JQ·TG60HR

Executive standard: Contract
 Conform to GB/T 8110 ER60-G
 AWS A5.28 ER90S-G

Instruction:JQ.TG60HR is argon arc welding wire used for non-copper coated low alloy steel in the nuclear power engineering. All-position welding is suitable, arc is soft and welding is stable; The weld joint appearance is flat and beautiful and it has excellent welding performance.

Purpose:It is used for nuclear power engineering and applicable to welding of low alloy steel of 600MPa grade.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Cu
Measured value	0.074	1.40	0.35	0.005	0.009	0.61	0.47	0.017	0.008

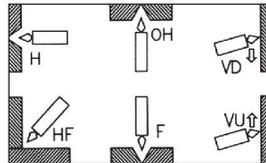
Mechanical properties of deposited metal

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
Measured value	638	544	29	145、144、138

Precautions:

- 1.Strictly control the content of impurities in the shielding gas to ensure purity of the gas.
- 2.The gas flow during welding is generally 15-25L/min, which can be adjusted according to the actual situation.
- 3.Thoroughly clear impurities at the part to be welded, such as oil, rust and water, before welding.

Welding position



JQ·TGR40

Carbon steel TIG wire

Conform to EN ISO 21952-B G 62A 2C1M3
 Equivalent to GB/T 8110 ER62-B3
 Equivalent to AWS A5.28 ER90S-B3

Instruction:JQ.TGR40 is argon arc welding wire used for heat resistant steel. The weld joint appearance is flat and beautiful. Strict control on the content of impurities such as S and P of the welding wire makes the weld joint have excellent comprehensive mechanical properties.

Purpose:It is applicable to welding of Cr2.5Mo heat resistant steel with working temperature below 550°C, such as boiler pipelines, high-temperature high-pressure vessels and petroleum refining equipment.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo	Cr	Cu
Guarantee value	0.07 0.12	0.75 1.50	0.30 0.90	≤ 0.025	≤ 0.025	≤ 0.20	0.90 1.20	2.30 2.70	≤ 0.35

Mechanical properties of deposited metal (Ar+1 - 5% O₂-shielded, heat treatment temperature: 690±15 C ×1h)

Test item	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	≥620	≥540	≥17

Welding wire specifications

Diameter (mm)	Φ1.0	Φ1.2	Φ1.6	Φ2.0	Φ2.5	Φ3.0



Conform to GB/T 29713 S308
AWS A5.9 ER308
ISO 14343-B-SS308

Instruction:The main composition of the welding wire is 18Cr-8Ni, and it is stainless steel TIG welding wire. The welding is smooth, depth of fusion is shallow, there is no spatter, the weld bead is smooth and flat, and single-side welding with back formation can be achieved. The deposited metal has good crack resistance and excellent corrosion resistance.

Purpose:It is applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components as well as containers such as tanks and pipelines, such as SUS304.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S
Guarantee value	≤0.08	≤2.00	≤1.00	18.0-20.0	8.0-10.5	—	≤0.045	≤0.030

Reference current (AC or DC)

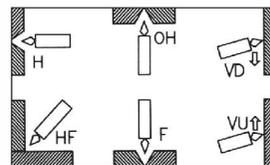
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



Instruction:The main composition of the welding wire is 18Cr-8Ni, and it is stainless steel TIG welding wire. The welding is smooth, depth of fusion is shallow, there is no spatter, the weld bead is smooth and flat, and single-side welding with back formation can be achieved. The deposited metal has good crack resistance and excellent corrosion resistance.

Purpose:It is used for welding of 12Cr18Ni9 (SUS 302), 06Cr19Ni10 (SUS 304) austenitic stainless steel and similar base metal, and also often used for sheet welding.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤0.080	1.00-2.50	0.30-0.65	19.50-22.00	9.00-11.00	≤0.75	≤0.030	≤0.030	≤0.75
Measured value	0.050	1.79	0.48	19.72	9.40	0.005	0.022	0.013	0.06

Reference current (AC or DC)

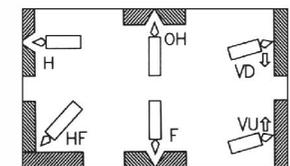
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·TG308L

Conform to GB/T 29713 S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-8Ni, which is ultra-low-C stainless steel TIG welding wire. Its deposited metal is more excellent in intergranular corrosion resistance. The welding is smooth, the weld bead is smooth and flat, and the crack resistance of deposited metal is good.

Purpose:It is widely applied to welding of petrochemical engineering, food machinery, medical equipment, fertilizer equipment, textile machinery, etc., such as 022Cr19Ni10 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	19.50 22.00	9.00 11.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.024	1.72	0.48	19.76	9.83	0.006	0.018	0.010	0.06

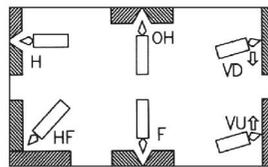
Reference current (AC or DC⁻)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adoꝑt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 - 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 - 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 - 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 - 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·TG309

Conform to GB/T 29713 S309
AWS A5.9 ER309
ISO 14343-A-G 22 12 H

Instruction:The main composition of the welding wire is 22Cr-12Ni, and it is stainless steel TIG welding wire. The welding is smooth, the weld bead is smooth and flat, and the deposited metal has good mechanical properties, crack resistance and oxidation resistance, as well as excellent corrosion resistance.

Purpose:It is often applied to welding of the same type of stainless steel, stainless steel lining, dissimilar steel (06Cr19Ni10 and low-carbon steel) and high-Cr steel and high-Mn steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.12	1.00 2.50	0.30 0.65	23.00 25.00	12.00 14.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.06	2.05	0.34	23.83	13.26	0.23	0.020	0.011	0.06

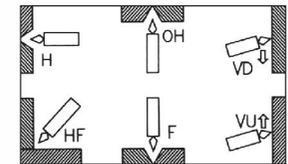
Reference current (AC or DC⁻)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adoꝑt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 - 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 - 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 - 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 - 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





Instruction:The main composition of the welding wire is ultra-low C-22Cr-12Ni, which is ultra-low-C stainless steel TIG welding wire. Since the deposited metal is of ultra-low C type, in addition to good crack resistance, it has better intergranular corrosion resistance.

Purpose:It is often applied to welding of the same type of stainless steel, clad steel and dissimilar steel structures manufactured by synthetic fiber and petrochemical equipment, as well as surfacing of the transition layer of the inner wall of the nuclear reactor and pressure vessel and welding of components inside the tower.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	23.00 25.00	12.00 14.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
	Measured value	0.026	2.11	0.38	23.56	12.31	0.006	0.017	0.008

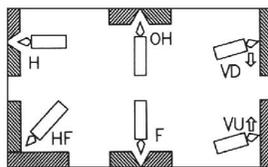
Reference current (AC or DC⁺)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



Instruction:The main composition of the welding wire is 25Cr-20Ni, which is completely austenitic structure stainless steel TIG welding wire. The deposited metal has excellent mechanical properties, crack resistance and oxidation resistance, and has excellent heat and corrosion resistance.

Purpose:It is often applied to welding of stainless steel lining, or welding of dissimilar steel, high-Cr steel and high-Mn steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	0.08 0.15	1.00 2.50	0.30 0.65	25.00 28.00	20.00 22.50	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
	Measured value	0.090	1.65	0.38	25.81	20.34	0.020	0.021	0.015

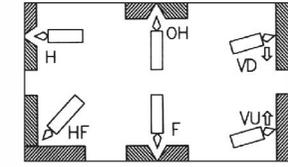
Reference current (AC or DC⁺)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





Conform to GB/T 29713 S316
AWS A5.9 ER316
ISO 14343-B-SS316

Instruction:The main composition of the welding wire is 18Cr-12Ni-2Mo, and it is stainless steel TIG welding wire. The weld bead metal performs excellent in corrosion resistance, heat resistance and crack resistance. Mo content makes it have excellent resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 06Cr17Ni12Mo2 (SUS 316). It can also be used for welding of high-Cr steel for which post-weld heat treatment is not required, and welding of dissimilar steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤	1.00	0.30	18.00	11.00	2.00	≤	≤	≤
	0.080	2.50	0.65	20.00	14.00	3.00	0.030	0.030	0.75
Measured value	0.040	1.71	0.45	18.54	11.50	2.18	0.018	0.009	0.08

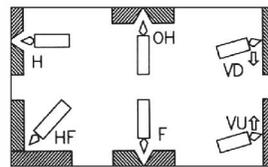
Reference current (AC or DC⁻)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.

Welding position



4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.

5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



Conform to GB/T 29713 S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo, and it is ultra-low-C stainless steel TIG welding wire. The weld bead metal performs excellent in corrosion resistance, heat resistance and crack resistance. Mo content makes it have good resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 022Cr17Ni12Mo2 (SUS 316L). It can also be used for welding of high-Cr steel for which post-weld heat treatment is not required, and welding of dissimilar steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤	1.00	0.30	18.00	11.00	2.00	≤	≤	≤
	0.030	2.50	0.65	20.00	14.00	3.00	0.030	0.030	0.75
Measured value	0.025	1.71	0.52	18.54	11.50	2.18	0.018	0.009	0.08

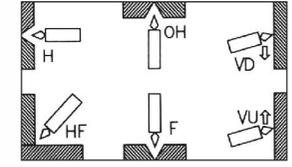
Reference current (AC or DC⁻)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.

Welding position



4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.

5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ•TG317

Conform to GB/T 29713 S317
AWS A5.9 ER317
ISO 14343-B-SS317

Instruction:The main composition of the welding wire is 19Cr-14Ni-3Mo, and it is stainless steel TIG welding wire. Due to increase in the content of alloying elements, such as Cr, Ni and Mo, on the basis of SUS 316, the weld bead metal has better corrosion, heat and crack resistance. Moreover, its resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts also becomes more excellent, especially to pitting of Cl ion.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 06Cr17Ni12Mo2 (SUS 316).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤	1.00	0.30	18.50	13.00	3.00	≤	≤	≤
	0.080	2.50	0.65	20.50	15.00	4.00	0.030	0.030	0.75
Measured value	0.040	1.86	0.45	19.40	14.20	3.50	0.020	0.007	0.09

Reference current (AC or DC⁺)

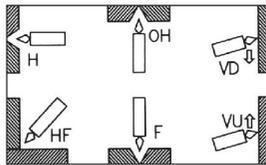
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adoꝑt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
- 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
- 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
- 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
- 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•TG321

stainless steel TIG welding wire

Conform to GB/T 29713 S321
AWS A5.9 ER321
ISO 14343-B-SS321

Instruction:The main composition of the welding wire is 18Cr-8Ni-Ti, and it is stainless steel TIG welding wire. Since Ti is added on the basis of SUS308, corrosion resistance can be effectively improved, and intergranular corrosion resistance is particularly improved.

Purpose:It is often applied to welding of 07Cr19Ni11Ti (SUS 321) and other austenitic stainless steel with similar composition, such as food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Ti
Guarantee value	≤	1.00	0.30	18.50	9.00	≤	≤	≤	≤	9×0-
	0.080	2.50	0.65	20.50	10.50	0.75	0.030	0.030	0.75	1.00
Measured value	0.028	1.85	0.45	18.92	9.25	0.007	0.021	0.010	0.12	0.34

Reference current (AC or DC⁺)

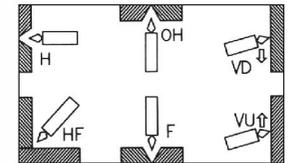
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adoꝑt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
- 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
- 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
- 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
- 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





Conform to GB/T 29713 S347
 AWS A5.9 ER347
 ISO 14343-A-G 19 9 Nb

Instruction:The main composition of the welding wire is 19Cr-11Ni-Nb, and it is stainless steel TIG welding wire. Since Nb is added on the basis of SUS308, corrosion resistance can be effectively improved, and intergranular corrosion resistance is particularly improved.

Purpose:It is often applied to food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions, such as 07Cr19Ni11Ti (SUS 321) and 07Cr18Ni11Nb (SUS 347) and welding of austenitic stainless steel with similar composition.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	Nb
Guarantee value	≤ 0.080	1.00 2.50	0.30 0.65	19.00 21.50	9.00 11.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75	10×C 1.00
Measured value	0.052	1.81	0.51	20.01	10.10	0.01	0.021	0.008	0.12	0.59

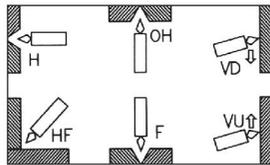
Reference current (AC or DC⁺)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 - 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 - 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 - 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 - 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



Instruction:The main composition of the welding wire is 19Cr-9Ni, and it is stainless steel TIG welding wire. The welding is smooth, the weld bead is smooth and flat, and the crack resistance of deposited metal is excellent.

Purpose:It is used for welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components as well as containers such as tanks and pipelines, such as 06Cr19Ni10 (SUS 304), or welding of austenitic stainless steel with similar base metal.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Guarantee value	≤ 0.06	1.00 2.50	0.30 0.65	18.00 20.00	8.00 11.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.056	1.87	0.55	19.35	8.85	0.024	0.011	0.056

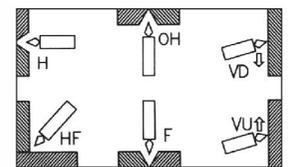
Reference current (AC or DC⁺)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 - 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 - 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 - 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 - 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





H1Cr18Ni9

Instruction:The main composition of the welding wire is 18Cr-9Ni, and it is stainless steel TIG welding wire. The welding is smooth, the weld bead is smooth and flat, and the crack resistance of deposited metal is excellent.

Purpose:It is widely applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components such as 12Cr18Ni9 (SUS 302), or welding of austenitic stainless steel with similar base metal.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Guarantee value	≤ 0.12	1.00 2.50	≤ 0.60	18.00 20.00	8.00 11.00	≤ 0.030	≤ 0.020	—
Measured value	0.073	1.72	0.58	19.48	8.52	0.024	0.011	0.073

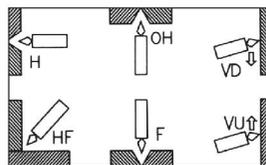
Reference current (AC or DC ~)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.

Welding position



4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



H1Cr18Ni9Ti

Instruction:The main composition of the welding wire is 18Cr-9Ni-Ti, and it is stainless steel TIG welding wire. Addition of Ti can effectively improve corrosion resistance, especially resistance to intergranular corrosion.

Purpose:It is often used for food machinery, medical equipment, textile printing and dyeing machinery, pressure vessels, petrochemical engineering and other occasions, such as welding of 07Cr19Ni11Ti (SUS321) and austenitic stainless steel with similar composition.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Ti
Guarantee value	≤ 0.12	1.00 2.50	0.30 0.65	18.00 20.00	8.00 11.00	≤ 0.030	≤ 0.020	$\frac{8 \times C}{1.00}$
Measured value	0.046	1.81	0.41	19.47	9.57	0.024	0.011	0.55

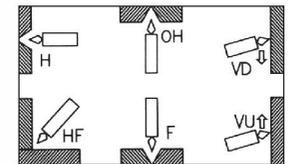
Reference current (AC or DC ~)

Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.

Welding position



4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ•TG410

Conform to GB/T 29713 S410
AWS A5.9 ER410
ISO 14343-A-G 13

Instruction:The main composition of the welding wire is 13Cr, and it is martensitic stainless steel TIG welding wire. The welding is smooth, the appearance is beautiful, and the deposited metal has good corrosion resistance.

Purpose:It is often applied to welding of martensitic stainless steel that is resistant to wear and corrosion, such as 12Cr13(SUS 410).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.12	≤ 0.60	≤ 0.50	11.50 - 13.50	≤ 0.60	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.11	0.43	0.45	11.80	0.18	0.36	0.019	0.009	0.35

Reference current (AC or DC)

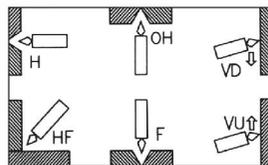
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
- 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
- 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
- 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
- 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•TG430

Conform to GB/T 29713 S430
AWS A5.9 ER430
ISO 14343-A-G 17

Instructions:The main composition of the welding wire is 17Cr, and it is ferritic stainless steel TIG welding wire. The welding is smooth, the appearance is beautiful, and the corrosion resistance is good.

Purpose:It is often applied to welding of wear-resistant and corrosion-resistant ferritic components, such as devices, guardrails and golf-club heads made of 10Cr17 (SUS 430).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.10	≤ 0.60	≤ 0.50	15.50 - 17.00	≤ 0.60	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.038	0.39	0.46	16.40	0.20	0.53	0.013	0.018	0.24

Reference current (AC or DC)

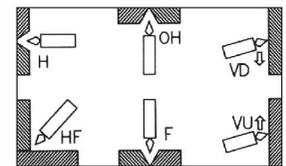
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

- 1.Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
- 2.Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
- 3.The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
- 4.Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
- 5.Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·TG2209

Conform to GB/T 29713 S2209
AWS A5.9 ER2209
ISO 14343-AG 22 93 N L

Instruction:The main composition of the welding wire is 22Cr-9Ni-3Mo-N, and it is austenitic-ferritic duplex stainless steel TIG welding wire. Since the deposited metal contains about 40% of ferrite, the deposited metal combines the comprehensive properties of austenitic stainless steel with the stress corrosion resistance of ferritic stainless steel, making it an emerging welding material.

Purpose:It is often applied to petrochemical engineering, shipbuilding and other industries, such as welding of 022Cr22Ni5Mo3N (SUS 2205).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	N
Guarantee value	≤ 0.030	0.50 2.00	≤ 0.90	21.50 23.50	7.50 9.50	2.50 3.50	≤ 0.030	≤ 0.030	≤ 0.75	0.08 0.20
	0.022	1.67	0.44	22.60	8.70	3.20	0.011	0.009	0.16	0.15
Measured value										

Reference current (AC or DC)

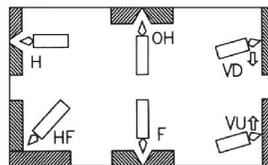
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·TG2594

Conform to GB/T 29713 S2594
AWS A5.9 ER2594

Instruction:The welding wire is made of austenitic-ferritic duplex stainless steel. Since the deposited metal contains about 40% of ferrite, the deposited metal combines the comprehensive properties of austenitic stainless steel with the stress corrosion resistance of ferritic stainless steel, making it an emerging welding material.

Purpose:It is often applied to petrochemical engineering, shipbuilding and other industries, such as welding of stainless steel 2594.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu	N
Guarantee value	≤ 0.030	≤ 2.50	≤ 1.00	24.00 27.00	8.00 10.50	2.50 4.50	≤ 0.030	≤ 0.020	≤ 1.50	0.20 0.30
	0.021	2.10	0.56	25.6	9.75	3.25	0.011	0.009	0.15	0.22
Measured value										

Reference current (AC or DC)

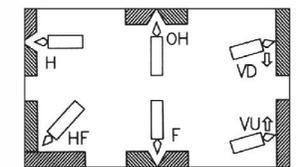
Diameter(mm)	Φ 1.6	Φ 2.0	Φ 2.5	Φ 3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·TG308LT

Conform to GB/T 29713 S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instructions:The main composition of the welding wire is ultra-low C-18Cr-8Ni, which is ultra-low-C stainless steel TIG welding wire. It has good impact toughness at -196°C and its deposited metal is excellent in intergranular corrosion resistance. The welding is smooth, the weld bead is smooth and flat, and the crack resistance of deposited metal is good.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr19Ni10 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	19.50 22.00	9.00 11.00	≤ 0.75	≤ 0.025	≤ 0.020	≤ 0.75
Measured value	0.025	1.76	0.50	19.86	9.85	0.006	0.015	0.009	0.06

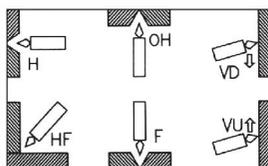
Reference current (AC or DC)

Diameter(mm)	Φ1.6	Φ2.0	Φ2.5	Φ3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·TG316LT

Conform to GB/T 29713 S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instruction:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo, and it is ultra-low-C stainless steel TIG welding wire. It has good impact toughness at -196°C, and the weld bead metal has excellent corrosion resistance, heat resistance and crack resistance, as well as good resistance to corrosion of acetic acid, sulfurous acid, phosphoric acid and salts.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr17Ni12Mo2 (SUS 316L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	0.30 0.65	18.00 20.00	11.00 14.00	2.00 3.00	≤ 0.025	≤ 0.020	≤ 0.75
Measured value	0.025	1.70	0.54	18.55	11.52	2.28	0.015	0.008	0.08

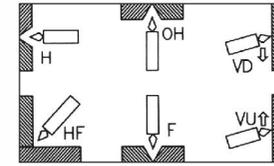
Reference current (AC or DC)

Diameter(mm)	Φ1.6	Φ2.0	Φ2.5	Φ3.2
Weiding current(A)	50~100	100~200	200~300	300~400

Precautions:

1. Shielding gas: Adopt pure Ar; Flow: It is 9-14L/min when the current is 100-200A, and is 14-18L/min when the current is 200-300A.
 2. Extension length of tungsten electrode: 3 - 5mm; Arc length: 1 - 3mm.
 3. The wind speed is limited to be ≤ 1.0m/s; It is recommended to supply argon gas for shielding on the back side of the weld zone.
 4. Considering the magnitude of energy of the welding line imposes direct effect on mechanical properties and crack resistance of the weld metal during welding, it is necessary to pay more attention to it.
 5. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





Submerged arc welding wire description

I. Application of submerged arc welding

Along with continuous expansion of the application range of automatic welding equipment and improvement of the automatic welding process, the proportion of applying submerged arc welding to welding of large components is increasing and the demand for submerged arc welding wires is also increasing. In addition, submerged arc welding has been widely applied relying on a series of characteristics, such as high welding production efficiency, stable and reliable welding quality and better labor conditions for operators. Therefore, lots of important welding structures, such as boilers, nuclear power plant containers, pressure vessels, chemical equipment, large and medium-sized spiral pipes, bridges, ships and rolling stock adopt or partially adopt submerged arc welding for welding works.

II. Selection of combinations of submerged arc welding wire/flux

In order to ensure good weld joint appearance and obtain good metallurgical reaction, it is required to reasonably select the correct submerged arc welding wire, which shall be matched with corresponding flux according to materials to be welded, workpiece structure, working conditions, environment, status of welding equipment and requirements for performance of the welded joint, and then operate in accordance with appropriate welding process and specification. For welding of carbon steel and low alloy steel, submerged arc welding wire-flux corresponding to the strength grade of steel is generally selected, and plasticity and toughness requirements are also taken into account; for dissimilar steel welding between low carbon steel and low alloy steel, submerged arc welding wire-flux corresponding to the steel with low strength grade is generally selected; for welding of heat resistant steel, it is required to select the welding wire which is basically consistent with the base metal in terms of composition, especially elements such as Mo and Cr, but C content can be lower than that of the base metal; for welding of stainless steel, the welding wire shall be selected based on composition of the base metal to be welded. The selected wire shall have alloy system the same and composition similar to (equal to or slightly higher than) the base metal. Because submerged arc welding is performed by a combination of submerged arc welding wire and submerged arc welding flux, difference in flux also determines difference in the performance of the welded joint.

III. Precautions for submerged arc welding:

1. In order to prevent defects such as burn through, lack of penetration, insufficient weld reinforcement and deviation from the weld bead, it is necessary to make full preparation before welding in accordance with the welding specification, thickness of the plate, weld root gap, groove angle, groove and assembly accuracy and pay attention to the influence of upward welding and downward welding on the depth of fusion.
2. Impurities such as rust, oil stain and water at the part to be welded of the base metal are causes for defects such as pits, pores and cracks, or affect mechanical properties, so they must be thoroughly removed before welding.

3. Too small welding current will lead to poor weld joint appearance, undercut, lack of penetration and slag inclusion; Too large current will result in deterioration of physical and chemical properties and crack resistance of welded joints, burn-through, rough weld joint appearance and difficult slag removal. Increasing welding current blindly for onesided pursuit of efficiency and extremely lowering down welding specification for pursuit of high performance are extremely unfavorable.
4. For welding of low-alloy high-strength steel and low-temperature steel, in order to make the weld joint have good mechanical properties, It is recommended to perform multi-layer multi-pass welding according to the recommended specification.
5. The tilt direction of the welding wire and the workpiece will affect the shape and depth of fusion, namely, the welding wire tilting forward or upward welding will cause larger depth of fusion; when the welding wire tilts backward (or downward welding), the depth of fusion will be shallow, and the weld width will increase.
6. When gas flame is adopted for preheating or removing water on the welding surface, the heating temperature must be larger than 100° C and maintained for a while, otherwise, it is easy to adsorb moisture.

Concise table of submerged arc welding wires

Page	Model	型号		Main purpose
		GB	AWS	
293	JQ•H08A JQ•H08E	SU08A SU08E	EL8	Weld low-carbon steel and some low-alloy steel structures
294	JQ•H15A	SU13	—	It is applicable to welding of carbon steel and low-alloy steel structures
295	JQ•H08MnA	SU26	EM12	It is applicable to welding of carbon steel and low-alloy steel structures
296	JQ•H15Mn	SU27	—	It is applicable to welding of carbon steel and low-alloy steel structures
297	JQ•H10Mn2	SU34	EH14	It is applicable to welding of carbon steel and low-alloy steel structures
298	JQ•H10MnSi	SU28	EM13K	Weld important low carbon steel and low alloy steel structures
299	JQ•H10MnSiA	SU28	EM13K	Weld important low carbon steel and low alloy steel structures
300	JQ•H08Mn2SiA	SU45	—	It is applicable to welding of carbon steel and low-alloy steel structures
301	JQ•H11Mn2SiA	SU31	—	Weld low-carbon steel and high-strength steel with tensile strength grade of 500N/mm ²
302	JQ•H08MnMoA	SUM3	—	Matched with sintered flux 101, it can be used for welding of base metal with tensile strength grade of 55-60MPa
303	JQ•H08Mn2MoA	SUM31	—	Matched with sintered flux 101, it can be used for welding of base metal with tensile strength grade of 600-700MPa
304	JQ•WEF1	—	EF1	It is used for welding of large boilers and pressure vessels made of WB36 and HY80 base metal.

Concise table of submerged arc welding wires

Page	Model	型号		Main purpose
		GB	AWS	
305	JQ•H08MnMoTiB (H08C)	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness and high strength
306	JQ•H08MnNiTiB (H08D)	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness and high strength
307	JQ•H60Q	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness and high strength
308	JQ•H08CrMoA	SU1CM2	—	Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C
309	JQ•H08CrMoVA	SU1CMV	—	Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C
310	JQ•H13CrMoA	SU1CM3	—	Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C
311	JQ•H14Cr1MoR	SUC1M3	EB2R	It is used for welding of 14CrMo1R heat resistant steel
312	JQ•H09MnNiDR	—	ENi3	It is used for welding of low temperature steel such as 09MnNiDR
313	JQ•H08MnE	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness
314	JQ•H08Mn2E	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness
315	JQ•H08Mn2R	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness
316	JQ•CJQ-1	—	—	Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness
317	JQ•TH500-NQ- III	—	—	Matched with sintered flux SJ101NQ, it can be used for welding of weathering resistant steel structures with tensile strength grade of 550MPa
318	JQ•TH550-NQ- III	—	—	Matched with sintered flux SJ101NQ, it can be used for welding of weathering resistant steel structures with tensile strength grade of 550MPa

Concise table of stainless steel submerged arc welding wires

Page	Model	型号		Main purpose
		GB	AWS	
319	JQ•MH308	S308	ER308	It is used for welding of Cr19Ni9 stainless steel structures
320	JQ•MH308L	S308L	ER308L	It is used for welding of ultra-low-carbon 00Cr19Ni10 stainless steel structures
321	JQ•MH309	S309	ER309	It is used for welding of Cr24Ni13 stainless steel structures
322	JQ•MH309L	S309L	ER309L	It is used for welding of ultra-low-carbon 00Cr24Ni13 stainless steel structures
323	JQ•MH310	S310	ER310	It is used for welding of Cr25Ni20 stainless steel structures
324	JQ•MH316	S316	ER316	It is used for welding of 06Cr17Ni12Mo stainless steel structures
325	JQ•MH316L	S316L	ER316L	It is used for welding of ultra-low-carbon 00Cr19Ni12Mo2 stainless steel structures
326	JQ•MH321	S321	ER321	It is used for welding of Cr19Ni9Ti stainless steel structures
327	JQ•MH347	S347	ER347	It is used for welding of Cr19Ni9Nb stainless steel structures
328	JQ•MH0Cr19Ni9	—	—	It is used for welding of Cr19Ni9 stainless steel structures
329	JQ•MH1Cr18Ni9Ti	—	—	It is used for welding of Cr19Ni9Ti stainless steel structures
330	JQ•MH410	S410	ER410	It is used for welding of 12Cr13 stainless steel structures
331	JQ•MH430	S430	ER430	It is used for welding of 10Cr17 stainless steel structures
332	JQ•MH308LT	S308L	ER308L	It is used for welding of cryogenic 022Cr19Ni10 and other materials
333	JQ•MH316LT	S316L	ER316L	It is used for welding of cryogenic 022Cr17Ni12Mo2 and other materials
334	Stainless steel welding strip	—	—	Large-area submerged-arc surfacing or electroslag surfacing on the inner surface of the container
335	JQ•HD04A	—	—	It is applied to strip surfacing of low carbon steel and part of low alloy steel



JQ·H08A JQ·H08E

Conform to GB/T 5293 SU08A、SU08E
Equivalent to AWS E18
ISO 14171-B-SU11

Instructions:The low-manganese low-silicon welding wire is matched with the flux of high manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rapt on the base metal will not affect the welding process, so it is the submerged arc welding wire with the largest consumption in China at present. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 301 and 501, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa.

Chemical composition of welding wire (%)

Model	C	Mn	Si	S	P	Cr	Ni	Cu
JQ·H08A	≤0.10	0.40 - 0.65	≤0.03	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35
Measured value	0.060	0.45	0.012	0.014	0.020	0.017	0.022	0.113
JQ·H08E	≤0.10	0.40 - 0.65	≤0.03	≤ 0.020	≤ 0.020	≤0.20	≤0.30	≤0.35
Measured value	0.060	0.46	0.025	0.010	0.011	0.016	0.017	0.11

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ301	430~600	≥330	≥20	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H15A

Conform to GB/T 5293 SU13
Equivalent to ISO 14171-B-SU11

Instructions:The low-manganese low-silicon welding wire is matched with the flux of high manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rapt on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 301 and 501, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	0.11 - 0.18	0.35 - 0.65	≤ 0.030	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ301	430~600	≥330	≥20	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H08MnA

Conform to GB/T 5293 SU26
Equivalent to AWS EM12
ISO 14171-B- SU22

Instructions:The medium-manganese low-silicon welding wire is matched with the flux of medium manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rasi on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.10	0.80 - 1.10	≤0.07	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35
Measured value	0.066	0.96	0.038	0.007	0.010	0.027	0.011	0.110

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ101	430~600	≥330	≥20	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H15Mn

Conform to GB/T 5293 SU27
Equivalent to ISO 14171-B-SU22

Instructions:The medium-manganese low-silicon welding wire is matched with the flux of medium manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rasi on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	0.11 - 0.18	0.80 - 1.10	≤ 0.030	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ101	430~600	≥330	≥20	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H10Mn2

Conform to GB/T 5293 SU34
Equivalent to AWS EH14
ISO 14171-B-SU33

Instructions:The medium-manganese low-silicon welding wire is matched with the flux of medium manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rasi on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 500MPa. Its deposited metal has very stable mechanical properties.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.12	1.50 1.90	≤ 0.070	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35
Measured value	0.066	1.62	0.011	0.011	0.011	0.013	0.007	0.12

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-40°C
JQ·SJ101	490~670	≥390	≥18	—	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H10MnSi

Conform to GB/T 5293 SU28
Equivalent to AWS EM13K
ISO 14171-B-SU25

Instructions:The content of manganese and silicon is moderate, and it is matched with the flux of low manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rasi on the base metal will not affect the welding process. The welding efficiency is high.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa. It is mostly used for welding of boilers, pressure vessels, bridges and ships.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.14	0.80 1.10	0.60 0.90	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35
Measured value	0.089	0.98	0.67	0.023	0.032	0.015	0.034	0.11

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-20°C
JQ·SJ101	430~600	≥330	≥20	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ•H10MnSiA

Conform to GB/T 5293 SU28
Equivalent to AWS EM13K
ISO 14171-B- SU25

Instructions:The content of manganese and silicon is moderate, and it is matched with the flux of low manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rast on the base metal will not affect the welding process. The welding efficiency is high.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 420MPa. It is mostly used for welding of boilers, pressure vessels, bridges and ships.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	0.06 0.15	0.90 1.40	0.45 0.75	≤ 0.030	≤ 0.025	≤0.20	≤0.30	≤0.35
Measured value	0.089	1.11	0.68	0.023	0.020	0.015	0.033	0.11

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				0°C	-20°C
JQ•SJ101	430~600	≥330	≥20	—	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ•H08Mn2SiA

Conform to GB/T 5293 SU45
Equivalent to ISO14171-B- SU42

Instructions:The medium-manganese low-silicon welding wire is matched with the flux of medium manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rast on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux 101, it can be used for high-speed welding and filling welding of the base metal with tensile strength grade of 500MPa. Its deposited metal has very stable mechanical properties.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤0.11	1.80 2.10	0.65 0.95	≤ 0.030	≤ 0.030	≤0.20	≤0.30	≤0.35
Measured value	0.066	1.95	0.81	0.012	0.015	0.026	0.013	0.13

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-20°C
JQ•SJ101	490~670	≥390	≥18	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ•H11Mn2SiA

Conform to GB/T 5293 SU31

Instructions:The medium-manganese low-silicon welding wire is matched with the flux of medium manganese and silicon content. In addition to excellent bead appearance and slag removal performance, The rapt on the base metal will not affect the welding process. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux JQ•SJ101, it can be used for highspeed welding and filling welding of the base metal with tensile strength grade of 500N/mm². Its deposited metal has very stable mechanical properties.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
Guarantee value	0.06 0.15	1.40 1.85	0.80 1.15	≤ 0.025	≤ 0.025	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.03	≤ 0.50
Measured value	0.078	1.46	0.88	0.012	0.011	0.016	0.030	0.003	0.005	0.126

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ•SJ101	490~670	≥390	≥18	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ•H08MnMoA

Conform to GB/T 5293 SUM3
Equivalent to ISO 14171-B-SU3M3

Instructions:Low alloy steel welding wire, matched with sintered flux 101, it can be used for welding of the base metal with tensile strength grade of 550-600MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	≤0.10	1.20 1.60	≤0.25	≤0.030	≤0.030
Measured value	0.078	1.34	0.21	0.008	0.011
Items	Ti	Cr	Ni	Mo	Cu
Guarantee value	0.05 0.15	≤0.20	≤0.30	0.30 0.50	≤0.35
Measured value	0.089	0.064	0.071	0.38	0.16

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ•SJ101	550~700	≥470	≥18	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·H08Mn2MoA

Conform to GB/T 12470 SUM31
Equivalent to ISO 14171-B-SU4M3



JQ·WEF1

AWS A5.23 EF1

Instructions:Low-alloy steel welding wire, matched with sintered flux SJ102, it can be used for welding of the base metal with tensile strength grade of 600-700MPa.

Instructions:Low-alloy steel welding wire, matched with sintered flux JQ·SJ121T, it can be used for welding of the base metal with tensile strength grade of 620MPa, as well as welding of boiler drums of large power stations, high-pressure vessels and steam pipes made of WB36 and HY80 base metal.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	0.06 0.11	1.60 1.90	≤0.25	≤0.030	≤0.030
Measured value	0.086	1.62	0.15	0.005	0.011
Items	Ti	Cr	Ni	Cu	Mo
Guarantee value	0.05 0.15	≤0.20	≤0.30	≤0.35	0.50 0.70
Measured value	0.11	0.074	0.055	0.19	0.55

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	≤0.12	0.70 1.50	≤0.80	≤0.030	≤0.030
Measured value	0.070	1.10	0.40	0.015	0.015
Items	Ni	Cr	Mo	Cu	
Guarantee value	0.90 1.70	≤0.15	≤0.55	0.30 0.60	
Measured value	1.30	0.07	0.22	0.45	

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ102	690~830	≥610	≥14	≥27

Mechanical properties of deposited metal (620 C × 4h heat treatment)

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0°C
JQ·SJ121T	620~760	≥540	≥17	≥60

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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JQ·H08MnMoTiB (H08C)

Instructions:When the special low-sulfur-phosphorus welding wire for pipes is matched with corresponding flux for welding, the weld joint appearance is beautiful and the slag removal property is excellent. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux JQ.SJ101G, it is mainly used for welding of pipes which are required to have high toughness. It can satisfy high-current high-speed welding.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Mo	Ti	B	Cu
Guarantee value	≤ 0.10	1.50 1.70	1.15 1.35	≤ 0.010	≤ 0.016	0.30 0.40	0.04 0.12	0.002 0.006	≤ 0.10
Measured value	0.07	1.64	0.25	0.003	0.006	0.37	0.10	0.005	0.03

Mechanical properties of deposited metal (one example)

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ101G	610	505	28	110 95 108

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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JQ·H08MnNiTiB (H08D)

Instructions:When the special low-sulfur-phosphorus welding wire for pipes is matched with corresponding flux for welding, the weld joint appearance is beautiful and the slag removal property is excellent. The power supply for welding can be single or double pole, AC or DC.

Purpose:Matched with sintered flux JQ.SJ101G, it is mainly used for welding of pipes which are required to have high toughness. It can satisfy high-current high-speed welding.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	P	Ni	Ti	B	Cu
Guarantee value	0.060 0.120	1.20 1.90	≤ 0.20	≤ 0.30	≤ 0.020	0.25 0.50	0.025 0.16	0.002 0.010	≤ 0.20
Measured value	0.06	1.66	0.12	0.05	0.006	0.35	0.10	0.005	0.03

Mechanical properties of deposited metal (one example)

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101G	560	460	30	120 115 110

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Instructions:JQ.H60Q is submerged arc welding wire of high strength grade. WISCO Wire Rod WS03

Purpose:This welding wire is matched with sintered flux of SJ101Q, the tensile strength of its deposited metal is more than 600MPa, and it has high low temperature impact toughness. It is applicable to submerged arc welding of domestic and foreign steel of corresponding grade, such as WISCO WD610 series steel, A710, WH590, and low-alloy high-strength steel, such as foreign CF-62 and HT60.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤ 0.100	1.80 2.10	≤ 0.070	≤ 0.015	≤ 0.020	0.20 0.50	0.20 0.50
Measured value	0.069	1.84	0.022	0.007	0.012	0.27	0.27

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ•SJ101Q	≥590	≥490	≥17	≥47

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Instructions:Welding wire for heat resistant steel. Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	≤ 0.10	0.40 0.70	0.15 0.35	≤ 0.030	≤ 0.030
Measured value	0.062	0.51	0.22	0.017	0.009
Items	Cr	Mo	Ni	Cu	
Guarantee value	0.80 1.10	0.40 0.60	≤ 0.30	≤ 0.35	
Measured value	0.81	0.43	0.049	0.21	

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0°C
JQ•SJ101	550~700	≥470	≥18	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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JQ•H08CrMoVA

Conform to GB/T 12470 SU1CMV



JQ•H13CrMoA

Conform to GB/T 12470 SU1CM3

Instructions:Welding wire for heat resistant steel. Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C.

Instructions:Welding wire for heat resistant steel. Matched with sintered flux SJ101, it can be used for welding of heat resistant steel with working temperature below 520°C.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	≤0.10	0.40 0.70	0.15 0.35	≤0.030	≤0.030
Items	Cr	Mo	Ni	Cu	V
Guarantee value	1.00 1.30	0.50 0.70	≤0.30	≤0.35	0.15 0.35

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	0.11 0.16	0.40 0.70	0.15 0.35	≤0.030	≤0.030
Items	Cr	Mo	Ni	Cu	
Guarantee value	0.80 1.10	0.40 0.60	≤0.30	≤0.35	

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0°C
JQ•SJ101	550~700	≥470	≥18	≥27

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) 0°C
JQ•SJ101	550~700	≥470	≥18	≥27

Welding wire specifications

Welding wire diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
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Welding wire specifications

Welding wire diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
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JQ•H14Cr1MoR

Conform to GB/T12470 SU1CM2
AWS A5.23 EB2R

Instructions: Special welding wire for heat resistant steel. Matched with sintered flux JQ•SJ614, it is characterized by low temper brittleness sensitivity, excellent low temperature impact toughness, excellent high temperature mechanical properties and large specification adaptability. It is used for welding of 14CrMo1R heat resistant steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Mo
Guarantee value	≤ 0.12	≤ 1.20	≤ 0.60	≤ 0.010	≤ 0.010	1.0 - 1.50	0.45 - 0.65
Measured value	0.080	0.81	0.30	0.005	0.008	1.35	0.55

Mechanical properties of deposited metal (620℃ × 20h heat treatment)

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20℃
JQ•SJ614	515~690	≥310	≥22	≥54

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ•H09MnNiDR

Conform to AWS A5.23 ENi3
NB/T47018.4

Instructions: H09MnNiDR is welding wire for low temperature steel and matched with JQ•SJ616 flux. It has excellent welding process and good low temperature toughness, and the weld joint is good in formability, spreadability and fusion. It can be used for welding of low-temperature steel such as 09MnNiDR.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	≤0.12	≤1.60	≤0.80	≤0.015	≤0.025
Measured value	0.058	0.67	0.16	0.004	0.006
Items	Ni	Cr	Mo	Cu	
Guarantee value	2.80 - 3.80	≤0.15	≤0.35	≤0.12	
Measured value	3.32	0.10	0.069	0.058	

Mechanical properties of deposited metal (620℃ × 1h heat treatment)

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -70℃
JQ•SJ616	480~660	≥400	≥22	≥54

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



Instructions:Low-sulfur-phosphorus medium-manganese welding wire. Match with corresponding flux. The weld joint appearance is beautiful and slag removal is quite easy. WISCO Wire Rod WQ -3

Purpose:Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness. It is the ideal welding material for bridges, ships, pressure vessels, engineering machinery and steel structures in alpine regions.

Instructions:Low-sulfur-phosphorus high-manganese welding wire. Match with corresponding flux. The weld joint appearance is beautiful and slag removal is quite easy. WISCO Wire Rod WQ-4

Purpose:Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness. It is the ideal welding material for bridges, ships, pressure vessels, engineering machinery and steel structures in alpine regions.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P
Guarantee value	0.06	0.80	≤	≤	≤
	0.10	1.10	0.070	0.010	0.015
Measured value	0.071	1.00	0.013	0.005	0.009

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni
Guarantee value	0.06	1.50	≤	≤	≤	≤
	0.10	1.90	0.070	0.010	0.015	0.50
Measured value	0.064	1.75	0.035	0.006	0.008	0.31

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20°C
JQ·SJ101Q	415~550	≥330	≥22	≥34

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101Q	480~650	≥400	≥22	≥34

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Instructions:Low-sulfur-phosphorus high-manganese welding wire. The welding wire contains traces of titanium and boron. Match with corresponding flux. The weld joint appearance is beautiful and slag removal is quite easy. WISCO Wire Rod WQ-2.

Purpose:Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness. It is the ideal welding material for bridges, ships, pressure vessels, engineering machinery and steel structures in alpine regions.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni
Guarantee value	0.06	1.50	≤	≤	≤	0.15
	0.10	1.90	0.070	0.006	0.020	0.50
Measured value	0.07	1.60	0.010	0.005	0.007	0.28

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101Q	480~650	≥400	≥22	≥34

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



Instructions:Low-sulfur-phosphorus high-manganese welding wire. Match with corresponding flux. The weld joint appearance is beautiful and slag removal is quite easy. WISCO Wire Rod WQ-1.

Purpose:Matched with sintered flux SJ101Q, it is mainly used for welding of structures which are required to have high toughness. It is the ideal welding material for bridges, ships, pressure vessels, engineering machinery and steel structures in alpine regions.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Ni
Guarantee value	≤	1.60	≤	≤	≤	0.25
	0.11	2.00	0.100	0.015	0.020	0.50
Measured value	0.087	1.70	0.072	0.005	0.010	0.35

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101Q	480~650	≥400	≥22	≥34

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0



JQ·TH500-NQ-III

Conform to TB/T 2374 TH500-NQ-III

Submerged arc
welding wire

Instructions: TH500-NQ-III is copper-coated submerged arc welding wire for weathering resistant steel of railway vehicles.

Purpose: Matched with sintered flux SJ101NQ, it can be used for welding of weathering resistant steel structures with tensile strength grade of 500MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤	1.00	≤	≤	≤	0.30	0.20	0.20
	0.12	1.60	0.35	0.020	0.025	0.90	0.80	0.50
Measured value	0.065	1.16	0.31	0.008	0.015	0.42	0.31	0.31

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101NQ	≥500	≥400	≥22	≥60

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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JQ·TH550-NQ-III

Conform to TB/T 2374 TH550-NQ-III

Submerged arc
welding wire

Instructions: TH550-NQ-III is copper-coated submerged arc welding wire for weathering resistant steel of railway vehicles.

Purpose: Matched with sintered flux SJ101NQ, it can be used for welding of weathering resistant steel structures with tensile strength grade of 550MPa.

Chemical composition of welding wire (%)

Items	C	Mn	Si	S	P	Cr	Ni	Cu
Guarantee value	≤	1.00	≤	≤	≤	0.30	0.20	0.20
	0.12	2.00	0.35	0.020	0.025	0.90	0.80	0.50
Measured value	0.065	1.26	0.33	0.006	0.013	0.41	0.32	0.31

Mechanical properties of deposited metal

Test item Matching flux	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40°C
JQ·SJ101NQ	≥550	≥450	≥22	≥60

Welding wire specifications

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
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Conform to GB/T 17854 S F308 G-S308
AWS A5.9 ER308
ISO 14343-B-SS308

Instructions:The main composition of the welding wire is 18Cr-8Ni. It is matched with the alkaline sintered flux exclusive for stainless steel and heat resistant steel JQ.SJ601. Its deposited metal has good mechanical properties, as well as good intergranular corrosion resistance and crack resistance.

Purpose:It is widely applied to petrochemical and other industries, such as welding of 12Cr18Ni9 (SUS 302) and 06Cr19Ni10 (SUS 304).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.080	1.00 2.50	≤0.60	19.50 22.00	9.00 11.00	≤0.030	≤0.030
Measured value	0.056	1.43	0.30	19.81	9.45	0.021	0.006

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.08	0.50 2.50	≤1.00	18.0 21.0	9.00 11.00	≤0.040	≤0.030
Measured value	0.030	1.23	0.47	19.20	9.42	0.025	0.013

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Guarantee value	≥520	≥30	—
Measured value	590	42	JQ•SJ601

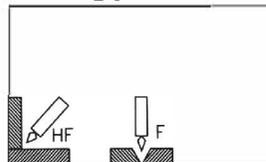
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



Conform to GB/T 17854 S F308L G-S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instructions:The main composition of the welding wire is ultra-low C-18Cr-8Ni. It is matched with the alkaline sintered flux exclusive for stainless steel and heat resistant steel - JQ.SJ601. Its deposited metal has good mechanical properties, as well as good intergranular corrosion resistance and crack resistance. Low carbon content brings excellent corrosion resistance.

Purpose:It is widely applied to petrochemical and other industries, such as welding of 022Cr18Ni9 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.03	1.00 2.50	≤0.60	19.50 22.00	9.00 11.00	≤0.030	≤0.020
Measured value	0.027	1.75	0.57	20.27	9.56	0.023	0.010

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤0.04	0.50 2.50	≤1.00	18.0 21.0	9.0 12.00	≤0.040	≤0.030
Measured value	0.031	1.62	0.57	19.69	10.32	0.016	0.009

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Guarantee value	≥480	≥30	JQ•SJ601
Measured value	568	35	JQ•SJ601

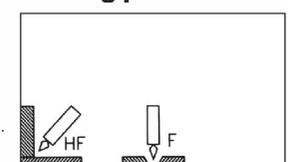
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ2.5	Φ3.2	Φ4.0	Φ5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MH309

Conform to GB/T 17854 S F309 G-S309
AWS A5.9 ER309
ISO 14343-A-G 22 12 H

Instructions:The main composition of the welding wire is 22Cr-12Ni. It is matched with alkaline sintered flux for stainless steel - JQ.SJ601 and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings good high temperature resistance.

Purpose:It is often used for welding of carbon steel with dissimilar stainless steel materials or welding of martensitic and pearlitic stainless steel with poor toughness. It is applied to petrochemical engineering, thermal power plants and other industries.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.12	1.00 2.50	≤ 0.60	23.00 25.00	12.00 14.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.051	1.79	0.56	23.84	13.10	0.20	0.024	0.012	0.13

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤ 0.15	0.50 2.50	≤ 1.00	22.0 25.0	12.00 14.00	≤ 0.040	≤ 0.030
Measured value	0.040	1.53	0.55	23.49	13.20	0.019	0.017

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Guarantee value	≥ 520	≥ 25	—
Measured value	599	36	JQ•SJ601

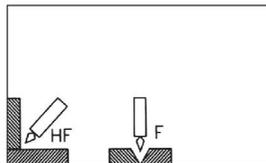
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MH309L

Conform to GB/T 17854 S F309L G-S309L
AWS A5.9 ER309L
ISO 14343-A-G 23 12 L

Instructions:The main composition of the welding wire is ultra-low C-22Cr-12Ni. It is matched with alkaline sintered flux for stainless steel -JQ.SJ601 and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings good high temperature resistance; Low carbon content brings excellent corrosion resistance.

Purpose:It is often applied to welding of carbon steel with dissimilar stainless steel materials, surfacing of the transition metal for inner wall of reaction vessels in the petrochemical industry, or welding of martensitic and ferritic stainless steel with poor toughness and welding of similar materials.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	≤ 0.60	23.00 25.00	12.00 14.00	≤ 0.75	≤ 0.030	≤ 0.020	≤ 0.75
Measured value	0.026	1.74	0.58	23.49	12.9	—	0.024	0.008	—

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	0.030	1.47	0.60	23.50	13.00	0.021	0.008

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Measured value	558	40	JQ•SJ601

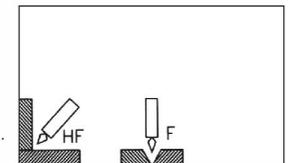
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ·MH310

Conform to GB/T 17854 S F310 G-S310
AWS A5.9 ER310
ISO 14343-A-G 25 20

Instructions:The main composition of the welding wire is 25Cr-20Ni. It is matched with alkaline sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings stable resistance to high temperature and it is able to keep stable at 1200 C.

Purpose:It is often applied to welding of high temperature resistant products such as high temperature furnaces and coal coking equipment, surfacing of the composite layer and welding of dissimilar steel.

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.15	1.00 2.50	≤ 0.60	25.00 28.00	20.00 22.00	≤ 0.75	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.092	1.78	0.65	26.26	20.84	—	0.019	0.018	—

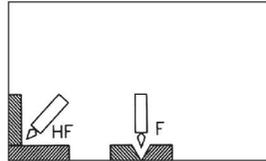
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ·MH316

Conform to GB/T 17854 S F316 G-S316
AWS A5.9 ER316
ISO 14343-B-SS316

Instructions:The main composition of the welding wire is 18Cr-12Ni-2Mo. It is matched with alkaline sintered flux for stainless steel -JQ.SJ601 and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings excellent corrosion resistance.

Purpose:It is often applied to petrochemical and fertilizer equipment, such as welding of 06Cr17Ni12Mo2 (SUS 316).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.080	1.00 2.50	≤ 0.60	18.00 20.00	11.00 14.00	2.00 3.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.035	1.77	0.58	18.96	11.87	2.21	0.024	0.011	—

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S
Guarantee value	≤ 0.08	0.50 2.50	≤ 1.00	17.0 20.0	11.00 14.00	2.00 3.00	≤ 0.040	≤ 0.030
Measured value	0.04	1.68	0.57	19.37	12.50	2.54	0.019	0.013

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Guarantee value	≥ 520	≥ 25	—
Measured value	593	37	JQ·SJ601

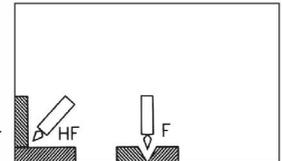
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MH316L

Conform to GB/T 17854 S F316L G -S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instructions:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo. It is matched with alkaline sintered flux for stainless steel - JQ.S J60 and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content and low C content bring more excellent corrosion resistance.

Purpose:It is often applied to important structures of petrochemical and fertilizer equipment, such as welding of 022Cr17Ni12Mo2(SUS 316L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	≤ 0.60	18.00 20.00	11.00 14.00	2.00 3.00	≤ 0.030	≤ 0.020	≤ 0.75
Measured value	0.024	1.75	0.48	18.68	11.66	2.20	0.024	0.014	—

Deposited metal (matching flux: JQ.S J601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S
Guarantee value	≤ 0.040	0.50 2.50	≤ 1.00	17.00 20.00	11.00 16.00	2.00 3.00	≤ 0.040	≤ 0.030
Measured value	0.031	1.69	0.48	19.00	11.31	2.43	0.013	0.010

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Guarantee value	≥ 480	≥ 30	JQ•SJ601
Measured value	578	38	JQ•SJ601

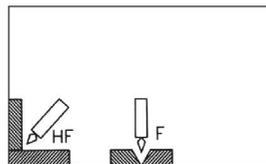
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MH321

Conform to GB/T 17854 S F321 G-S321
AWS A5.9 ER321
ISO 14343-B-SS321

Instructions:The main composition of the welding wire is 18Cr-8Ni-Ti. It is matched with alkaline sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. Addition of Ti can effectively improve corrosion resistance, especially resistance to intergranular corrosion.

Purpose:It is often applied to food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions, such as welding of 07Cr19Ni11Ti (S US21).

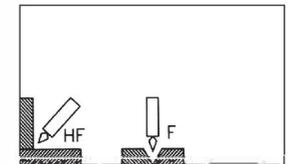
Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Ti
Guarantee value	≤ 0.080	1.00 2.50	≤ 0.60	18.50 20.50	9.00 10.50	≤ 0.75	≤ 0.030	≤ 0.030	9×C 1.00
Measured value	0.046	1.81	0.43	19.47	9.57	—	0.024	0.011	0.55

Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Welding position



Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.



JQ•MH347

Conform to GB/T 17854 S F347 G-S347
AWS A5.9 ER347
ISO 14343-A-G 19 9 Nb

Instructions:The main composition of the welding wire is 19Cr-11Ni-Nb. It is matched with alkaline sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. Addition of Nb can effectively improve corrosion resistance, especially resistance to intergranular corrosion.

Purpose:It is often applied to food machinery, medical equipment, pressure vessels, petrochemical engineering and other occasions, such as welding of 07Cr19Ni11Ti (SUS 321) and 07Cr18Ni11Nb (SUS 347).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.080	1.00 2.50	≤ 0.60	19.00 21.50	9.00 11.00	≤ 0.75	≤ 0.030	≤ 0.020	10×C 1.00
Measured value	0.052	1.70	0.52	19.10	9.52	—	0.024	0.010	0.60

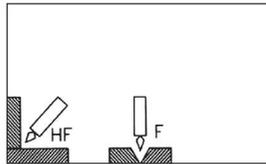
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MH0Cr19Ni9

Instructions:The main composition of the welding wire is 19Cr-9Ni. It is matched with alkaline sintered flux for stainless steel - JQ.SJ601 and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance.

Purpose:It is widely applied to welding of food machinery, medical equipment, fertilizer equipment, textile machinery and other components as well as containers such as tanks and pipelines, such as 06Cr19Ni10 (SUS 304).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Guarantee value	≤ 0.080	1.00 2.50	≤ 0.60	18.00 20.00	8.00 11.00	≤ 0.030	≤ 0.030	≤ 0.75
Measured value	0.051	1.63	0.51	18.52	9.64	0.024	0.012	—

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S	Cu
Measured value	0.052	1.43	0.54	18.92	9.83	0.020	0.005	—

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	Matching flux
Measured value	578	38	JQ•SJ601

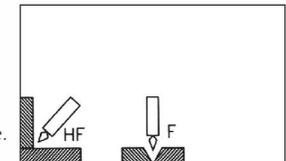
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350° C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MH1Cr18Ni9Ti



JQ•MH410

Conform to GB/T 17854 S F410 G-S410
AWS A5.9 ER410
ISO 14343-A-G 13

Instructions:The main composition of the welding wire is 18Cr-9Ni-Ti. It is matched with alkaline sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. Ti content makes it have good corrosion resistance, especially intergranular corrosion resistance.

Purpose:It is often applied to food machinery, medical equipment, textile printing and dyeing machinery, pressure vessels, petrochemical engineering and other occasions, such as welding of 07Cr19Ni11Ti (SUS321).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S	Ti
Guarantee value	≤ 0.120	1.00 2.50	≤ 0.60	18.00 20.00	8.00 11.00	≤ 0.030	≤ 0.030	8×C 1.00
Measured value	0.051	1.84	0.53	19.15	9.54	0.024	0.009	0.58

Reference current (AC or DC⁺)

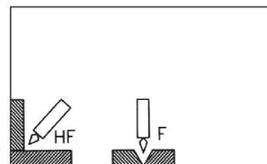
Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

1. The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
2. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
3. The flux must be baked at 300-350° C for 2h before use.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



Instructions:The main composition of the welding wire is 13Cr, and it is martensitic stainless steel submerged arc welding wire. It is matched with sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings good high temperature resistance.

Purpose:It is often applied to wear-resistant and corrosion-resistant occasions such as hydropower stations, such as welding of 12Cr13 (SUS410).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤ 0.12	≤ 0.60	≤ 0.50	11.50 13.50	≤ 0.60	≤ 0.030	≤ 0.030

Reference current (AC or DC⁺)

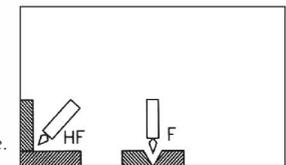
Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

1. The temperature between weld beads is recommended to be about 150° C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
2. Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
3. The flux must be baked at 300-350° C for 2h before use.

The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MH430

Conform to GB/T 17854 S F430 G-S430
AWS A5.9 ER430
ISO 14343-A-G 17

Submerged arc
welding wire

Instructions:The main composition of the welding wire is 17Cr, and it is ferritic stainless steel submerged arc welding wire. It is matched with sintered flux for stainless steel and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content brings good high temperature resistance.

Purpose:It is often applied to welding of components at wear-resistant and corrosion-resistant occasions, such as 10Cr17 (SUS 430).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤ 0.10	≤ 0.60	≤ 0.50	15.50 17.00	≤ 0.60	≤ 0.030	≤ 0.030

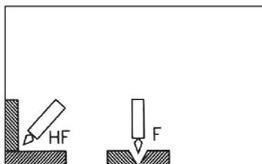
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150 °C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350 °C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



JQ•MH308LT

Conform to GB/T 17854 S F308L G-S308L
AWS A5.9 ER308L
ISO 14343-A-G 19 9 L

Instructions:The main composition of the welding wire is ultra-low C-18Cr-8Ni. It is matched with the alkaline sintered flux exclusive for cryogenic stainless steel -JQ•SJ601T. It has good impact toughness at -196 °C, and its deposited metal has good mechanical properties, as well as good intergranular corrosion resistance and crack resistance. Low carbon content brings excellent corrosion resistance.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr19Ni10 (SUS 304L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤ 0.03	1.00 2.50	≤ 0.60	19.50 22.00	9.00 11.00	≤ 0.025	≤ 0.015
Measured value	0.026	1.76	0.55	20.25	9.66	0.015	0.009

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	P	S
Guarantee value	≤ 0.04	0.50 2.50	≤ 1.00	18.0 21.0	9.00 11.00	≤ 0.030	≤ 0.020
Measured value	0.033	1.65	0.58	19.79	10.35	0.016	0.009

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	KV ₂ (J) -196 °C	Matching flux
Guarantee value	≥ 480	≥ 30	≥ 31	JQ•SJ601T
Measured value	578	33	49	JQ•SJ601T

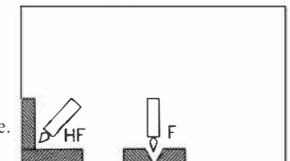
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150 °C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350 °C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position





JQ•MH316LT

Conform to GB/T 17854 S F316L G -S316L
AWS A5.9 ER316L
ISO 14343-A-G 19 12 3 L

Instructions:The main composition of the welding wire is ultra-low C-18Cr-12Ni-2Mo. It is matched with the alkaline sintered flux exclusive for cryogenic stainless steel -JQ•SJ601T. It has good impact toughness at -196 °C, and its deposited metal has good mechanical properties, crack resistance and intergranular corrosion resistance. High alloy content and low C content bring more excellent corrosion resistance.

Purpose:It is widely applied to welding of CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment in cryogenic environment, such as 022Cr17Ni12Mo2 (SUS 316L).

Chemical composition of welding wire (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S	Cu
Guarantee value	≤ 0.030	1.00 2.50	≤ 0.60	18.00 20.00	11.00 14.00	2.00 3.00	≤ 0.025	≤ 0.015	≤ 0.75
Measured value	0.022	1.78	0.46	18.78	11.76	2.32	0.020	0.010	—

Deposited metal (matching flux: JQ.SJ601) chemical composition (%)

Items	C	Mn	Si	Cr	Ni	Mo	P	S
Guarantee value	≤ 0.040	0.50 2.50	≤ 1.00	17.00 20.00	11.0 14.0	2.00 3.00	≤ 0.030	≤ 0.020
Measured value	0.028	1.65	0.42	19.10	11.21	2.44	0.013	0.010

Mechanical properties of deposited metal

Experimental Items	Rm (MPa)	A(%)	KV ₂ (J) -196 °C	Matching flux
Guarantee value	≥480	≥30	≥31	JQ•SJ601T
Measured value	578	38	45	JQ•SJ601T

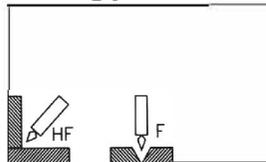
Reference current (AC or DC⁺)

Welding wire diameter (mm)	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Welding current (A)	400~500	450~550	500~600	550~650

Precautions:

- The temperature between weld beads is recommended to be about 150 °C. For small and medium sized multi-pass multi-layer welding, pay attention to controlling energy of the welding line.
- Thoroughly clear rust, moisture, oil stain, dust, etc. at the part to be welded.
- The flux must be baked at 300-350 °C for 2h before use. The above suggestions are for reference only, and the specific operation shall be subject to the site situation. If necessary, perform process evaluation before determining the welding scheme.

Welding position



The stainless steel welding strip

Stainless steel welding strip for surfacing of pressurebearing equipment

Instructions:The stainless steel welding strip is matched with the special sintered flux. The weld bead appearance and the slag removal performance are excellent.

Purpose:It is applied to large-area submerged arc surfacing or electroslag surfacing on the inner surface of hydrogenation reactors, primary flow synthesis towers and coal liquefaction reactors in the petrochemical industry and thick-walled pressure vessels of nuclear power plants. It is matched with sintered flux JQ.SJ34 or JQ.SJ602. The surfacing layer has small base metal dilution, high deposition rate and excellent performance, namely high quality, high efficiency and low dilution rate.

Welding strip model	C	Si	Mn	P	S	Ni	Cr	Mo	Nb
EQ308	≤ 0.060	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	18.0~ 21.0	≤ 0.50	—
EQ 308L	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	18.0~ 21.0	≤ 0.50	—
EQ309(A)	≤ 0.060	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	21.0~ 23.0	≤ 0.50	—
EQ309(B)	≤ 0.060	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	12.0~ 14.0	23.0~ 25.0	≤ 0.50	—
EQ309L(A)	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	21.0~ 23.0	≤ 0.50	—
EQ309L(B)	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	12.0~ 14.0	23.0~ 25.0	≤ 0.50	—
EQ309L Mo	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 14.0	21.0~ 25.0	2.0~ 3.5	—
EQ 316	≤ 0.060	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	11.0~ 15.0	17.5~ 22.5	2.0~ 3.5	—
EQ 316L	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	11.0~ 15.0	17.5~ 22.5	2.0~ 3.5	—
EQ 347	≤ 0.060	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	18.0~ 21.0	—	8×C% ~1.0
EQ 347L	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 12.0	18.0~ 21.0	—	8×C% ~1.0
EQ309LNb	≤ 0.030	≤ 1.00	0.5~ 2.5	≤ 0.025	≤ 0.015	9.0~ 14.0	21.0~ 25.0	—	8×C% ~1.0

Specification:0. 4/0. 5x30/50/60/75/90mm

Package form and weight

- Bracketless welding strip reel
- Weight of each reel is 25-35kg



Instructions: Carbon steel welding strip, manufactured through cutting STCC steel strip, is matched with special sintered flux. The weld bead appearance and the slag removal performance are excellent, and the tensile strength of the deposited metal reaches 500MPa.

Purpose: It is applied to strip surfacing of low carbon steel and part of low alloy steel. It is matched with sintered flux JQ.SJ312 for welding. It has small base metal dilution, high deposition rate and excellent surfacing layer performance, namely high quality, high efficiency and low dilution rate.

Measured value of chemical composition of welding strip (%)

Items	C	Si	Mn	P	S
Measured value	0.041	0.015	0.22	≤0.010	≤0.015

Specification: 0.5*60mm

Package form and weight

- (1) Bracketless welding strip reel
- (2) Weight of each reel is 20-25kg

Instructions on flux used in submerged arc welding

I. Flux selection principles

The flux plays roles of metal protection, metallurgical treatment and welding performance improvement in the welding process, and the sintered flux can flexibly transit alloy to the weld joint, meet different performance and composition requirements, and is suitable for applications where there are high requirements for slag removal performance and mechanical properties.

In general, for the flux with high alkalinity value, the weld joint has less impurities, which is beneficial to alloy transition, in addition, it can satisfy high requirements for mechanical properties, but its requirements for groove surface quality is strict and DCRP shall be adopted. While for the flux with low alkalinity value, though further improvement of the weld joint performance is restricted, it has other advantages, such as low requirements for power supply and moderate requirements for groove surface quality.

When selecting flux, it is required to take into account steel type, plate thickness, working conditions, stress state, joint form, welding equipment, welding process and all the required properties and then determine the combination of the welding wire and the flux that meets requirements. Moreover, try to determine the kind and model of the flux-welding wire after conducting the supporting test. In general, alkaline flux shall be selected when there are requirements for good plasticity, high impact toughness, good crack resistance, high strength, heat resistance and low temperature use.

II. Precautions for flux use

1. The flux is generally in bags, which shall be transported properly to prevent damage to the package; It shall be stored in a dry room to prevent moisture from affecting the welding quality.
2. Before use, the flux shall be baked according to the parameters specified in the instructions. When baked, the flux is scattered in the disk and the thickness is 50mm at most.
3. Before welding, the part to be welded of the base metal shall be cleaned of impurities such as rust, oil stain and water.
4. Before the recycled flux is put into use, it shall be cleaned of slag shell, milled powder and other impurities and evenly mixed with new flux.
5. In case of DC power supply, generally DCRP is adopted, which means the welding wire is connected with the positive pole.

Concise table of commonly used flux

Page	Model	Model	Flux type	Main purpose
336	JQ•SJ101	S 43A 2 FB-SU26 S 49A 4 FB-SU34	Fluorine-alkali type	It is matched with welding wires such as H08MnA and H10Mn2, for welding of important structural steel, steel for pressure vessels and steel for pipelines.
337	JQ•SJ101A	S 43A 2 FB-SU26 S 49A 2 FB-SU34	Fluorine-alkali type	Matched with welding wires such as H08MnA and H10Mn2, it can be used for welding of a variety of low-alloy steel structures and has good process performance.
338	JQ•SJ101H	S 49A 2 FB-SU34	Fluorine-alkali type	Matched with H10Mn2 and other welding wires, it can be used for horizontal-position welding of various low-alloy structural steel, such as storage tanks and hulls. The submerged-arc horizontal-position welding technology is applied in this process.
339	JQ•SJ101G	S 49A 4 FB-H08MnNiTiB S 55A 2 FB-H08MnMoTiB	Fluorine-alkali type	It is matched with welding wires such as H10Mn2 and H08C, for welding of oil and gas transmission pipelines, especially applicable to welding of $\times 65$ and $\times 70$ spiral welded pipes.
340	JQ•SJ101C	S 43A 2 FB-SU26 S 49A 2 FB-SU34	Fluorine-alkali type	Matched with welding wires such as H10Mn2 and H08MnA, it is specially used for welding hull structure and ship fittings, and can also be used for other important structures.
341	JQ•SJ101NQ	—	Fluorine-alkali type	Matched with JQ.TH550-NQ-III welding wire, and it can be used for welding of atmospheric corrosion resistant steel such as containers and rolling stock.
342	JQ•SJ101Q	S 49A 4 FB-H08Mn2E	Fluorine-alkali type	It is matched with welding wires such as H08MnE, H08Mn2E, H08Mn2R, CJQ-1 and H60Q, for welding of multiple low-alloy bridge and steel for pressure vessels.
343	JQ•SJ101D	S 43A 2 FB-SU26	Fluorine-alkali type	It is applicable to narrow gap welding and backing welding, and has excellent slag removal performance.
344	JQ•SJ101FNH	AWS F7A4-ECG-G	Aluminum-alkali type	It is used for welding of weathering resistant bridge steel structures of Q235q (D, E) FNH, Q345q (D, E) FNH and Q420q (D, E) FNH grades in rural atmospheric corrosion environment.
345	JQ•SJ101NHY	AWS F7A4-ECG-G	Aluminum-alkali type	It is used for welding of weathering resistant bridge steel structures of Q235q (D, E) NHY, Q345q (D, E) NHY and Q420q (D, E) NHY grades in marine atmospheric corrosion environment.

Page	Model	Model	Flux type	Main purpose
346	JQ•SJ102	S 49A 4 FB-SU34	Fluorine-alkali type	It is matched with welding wires of corresponding model such as H10Mn2 for welding of low-alloy steel, such as ships and pressure vessels.
347	JQ•SJ102Ni	S 49A 6 FB-SU34	Fluorine-alkali type	It is matched with welding wires such as H10Mn2 for welding of low-alloy steel, such as ships and pressure vessels.
348	JQ•SJ102GQ	S 83A 4 FB-SUM31	Fluorine-alkali type	It is matched with H08Mn2MoA welding wire for welding of structural steel for high-strength hulls and steel for low-temperature pressure containers.
349	JQ•SJ105	—	Fluorine-alkali type	Matched with corresponding welding wire, it is used for surfacing of rollers.
350	JQ•SJ105Q	—	Fluorine-alkali type	Matched with appropriate welding wires (such as H08MnE, H08Mn2E, H08Mn2R, CJQ-1 and H60Q), it is used for welding of various low-alloy bridge steel.
351	JQ•SJ121T	AWS F9A8-EF1-F1	Fluorine-alkali type	It is used for welding of large boilers and pressure vessels made of WB36 and HY80 base metal.
352	JQ•SJ201	S 49A 4 AB-SU34	Aluminum-alkali type	It is matched with welding wires of corresponding model such as H10Mn2 for welding of low-alloy steel, such as ships and pressure vessels.
353	JQ•SJ301	S 43A 2 CS-SU08A S 43A 2 CS-SU26	Silicon-calcium type	Matched with welding wires such as H08MnA and H08A, it can be applied to welding of ordinary structural steel, steel for boilers and steel for pipelines.
354	JQ•SJ402	S 49A 0 MS-SU08A	Silicon-manganese type	It is matched with welding wires such as H08A, for welding of low carbon steel and some low alloy steel structures, especially suitable for relatively high-speed sheet welding.
355	JQ•SJ501	S 43A 0 AR-SU08A	Aluminum-titanium type	It is matched with H08A and H08MnA welding wires, for welding of low carbon steel and some low alloy steel structures, suitable for high speed welding.
356	JQ•SJ303GS	S 43A 2 AR-SU08A	Aluminum-silicon type	It is matched with H08A, H08MnA and H08MnMoA welding wires, for welding of low carbon steel and some low alloy steel structures, especially suitable for high speed sheet welding.
357	JQ•SJ601	S F308G-S308	Alkali type	Matched with welding wires such as H0Cr21Ni10, it can be used for welding of stainless steel and heat resistant steel structures of corresponding model.



Conform to GB/T 5293 S 43A 2 FB-SU26
S 49A 4 FB-SU34
Equivalent to AWS A5.17 F6A0-EM12
F7A4-EH14
ISO 14174-S A FB 1

Page	Model	Model	Flux type	Main purpose
358	JQ·SJ602	—	—	Matched with stainless steel welding strip. It is used for corrosion-resistant and wear-resistant surfacing, as well as welding of nuclear island reactors, hydrogenation reactors, pressure vessels, urea synthesis towers and other important structures.
359	JQ·SJ312	—	—	It is applied to strip surfacing of low carbon steel and part of low alloy steel
360	JQ·SJ34	—	—	Matched with EQ308L, EQ309L, EQ347L and EQ316L, it is used for surfacing of stainless steel used for hydrogenation reactors and nuclear island reactors.
361	JQ·SJ601T	SF308LG-S308L	Special	It is used for welding of cryogenic stainless steel, such as 022Cr19Ni10 and 022Cr17Ni2Mo2
362	JQ·SJ614	GB/T S492FB-SU1CM2 AWS F8P0-EB2R-B2R	Fluorine-alkali type	It is used for welding of 14CrMo1R heat resistant steel
363	JQ·SJ616	AWS F7P10-ENI3-NI3	Fluorine-alkali type	It is used for welding of low temperature steel such as 09MnNDR
364	JQ·SJ629	—	Special type	It is used for welding of duplex stainless steel such as 2209
365	JQ·SJD107	—	Special type	It is mainly used for repair of hot rollers and break-down rollers
366	JQ·SJ414N	—	Special type	It is mainly used for hardfacing of continuous casting rollers

Instructions:JQ.SJ101 is fluorine-alkali sintered flux with the alkalinity of about 1.8. It is grey round particles, with the particle size of 2.0-0.28mm (10-60 mesh). Arc burning is stable during welding, slag removal is easy, the weld joint appearance is beautiful and its deposited metal has high low temperature impact toughness. It can be used under AC and DC. When DC is selected, the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08MnA, JQ.H10Mn2, JQ.H08MnMoA and JQ.H08Mn2MoA), it can be applied to welding of various low-alloy structural steel, such as hulls, boiler pressure vessels and pipes. It can be used for multi-layer welding, double-sided singlepass welding, multi-wire welding and narrow-gap submerged arc welding.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	19.2	33.5	24.0	22.8	0.031	0.025

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
					-20°C	-40°C
JQ·H08MnA	Guarantee value	430~600	≥330	≥20	≥27	—
	Measured value	500	385	35.5	128	—
JQ·H10Mn2	Guarantee value	490~670	≥390	≥18	—	≥27
	Measured value	535	425	32	—	132
JQ·H08MnMoA	Guarantee value	550~740	≥460	≥17	≥27	—
	Measured value	575	495	22	129	—
JQ·H08Mn2MoA	Guarantee value	690~890	≥550	≥14	≥27	—
	Measured value	765	635	30	66	—

Precautions:

- The flux must be baked at 300-350 ° C for 2h before use.
- The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ101A

Conform to GB/T 5293 S 43A2 FB-SU26
S 49A2 FB-SU34
Equivalent to AWS A5.17 F6A0-EM12
F7A0-EH14

Instructions:JQ.SJ101A is silicon-calcium sintered flux with the alkalinity of about 1.6. It is grey round particles, with the particle size of 2.0-0.28mm (10-60 mesh). Arc burning is stable during welding, slag removal is easy, and the weld joint appearance is beautiful. It can be used under AC and DC. When DC is selected, the welding wire is connected with the positive pole.

Purpose:Matched with suitable welding wires (such as JQ.H08MnA and JQ.H10Mn2), it can be used for welding of various low-alloy structural steel, suitable for large-parameter welding, and can be used for multi-layer welding and double-sided single-pass welding.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	26.2	27.5	27.0	18.8	0.033	0.045

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ•H10Mn2	Guarantee value	490~670	≥390	≥18	≥27
	Measured value	512	415	27	94 92 103

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ101H

Conform to GB/T 5293 S 49A2 FB-SU34
Equivalent to AWS A5.17 F7A0-EH14

Instructions:JQ.SJ101H is silicon-calcium sintered flux with the alkalinity of about 1.7 and the particle size of 30-60 mesh. This flux can be used for horizontal-position welding. Arc burning is stable during welding, slag removal is easy, the weld joint appearance is beautiful, and its deposited metal has high strength and low temperature impact toughness.

Purpose:Matched with suitable welding wires (such as JQ.H10Mn2), it can be used for welding of a variety of low-alloy structural steel, such as storage tanks and hulls, and the application of submerged-arc horizontal position welding technology can not only improve production efficiency, but also save labor costs.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.050	≤ 0.060
Measured value	25-35	35-45	25-30	0.033	0.037

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ•H10Mn2	Guarantee value	490~670	≥390	≥18	≥27
	Measured value	581	491	27	92 87 100

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ101G

Conform to GB/T 5293 S 49A 4 FB-H08MnNiTiB
 GB/T 12470 S 55A 2 FB-H08MnMoTiB
 Equivalent to AWS A5.17 F6A4-EM12
 ISO 14174-SA FB 1

Instructions:JQ.SJ101G is fluorine-alkali sintered flux exclusive for spiral welded pipes with the alkalinity of 1.8. It is grey round particles, with the particle size of 2.0-0.28mm (10-60 mesh). It has excellent welding performance and high welding speed. Moreover, arc burning is stable, slag removal is easy and weld joint appearance is beautiful. Since special process is adopted for manufacturing, the metallurgical reaction is sufficient during welding, and the deposited metal is pure and has high low temperature impact toughness. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with welding wires such as JQ.H08MnMoTiB and H08MnNiTiB, it can be used for welding of spiral welded pipe joint of oil and gas transport pipelines. Matched with H08MnMoTiB welding wire, it is especially applicable to welding of spiral welded pipes of $\times 65$ or $\times 70$ grade, and the welding speed can reach above 70m/h.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	19.0	32.2	24.1	24.5	0.025	0.028

Mechanical properties of deposited metal (according to GB/T5293 S 49A 4 FB-H08MnNiTiB)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-20°C	-40°C
Guarantee value	490~670	≥390	≥18	≥90	≥60

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ101C

Conform to GB/T 5293 S 49A 2 FB-SU34
 Equivalent to ISO 14174-SA FB 1

Instructions:JQ.SJ101C is fluorine-alkali sintered flux for ships with the alkalinity of about 1.8. It is gray round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, sufficient metallurgical reaction, stable arc burning, easy slag removal, and beautiful weld joint appearance. In addition, the deposited metal has high low temperature impact toughness. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08MnA and JQ.H10Mn2), it can be used for welding of hull structures, as well as welding of important structures, such as boilers, pressure vessels and pipes.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	18.8	32.5	25.1	23.4	0.026	0.021

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ·H08MnA	Guarantee value	490~670	≥390	≥18	≥34
	Measured value	510	395	33	126
JQ·H10Mn2	Guarantee value	490~670	≥390	≥18	≥34
	Measured value	560	430	32	118

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



Instructions:JQ.SJ101NQ is fluorine-alkali sintered flux with the alkalinity of about 2.1. It is gray round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is special sintered flux for high-strength and atmospheric corrosion resistant steel for railway vehicles with tensile strength grade of 550-600MPa. Arc burning is stable during welding, slag removal is easy, the weld joint appearance is beautiful, and its deposited metal has high low temperature impact toughness. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with JQ.TH550-NQ-III welding wire, it can be used for welding of atmospheric corrosion resistant steel such as containers and rolling stock.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	17.6	35.5	23.2	23.5	0.028	0.027

Mechanical properties of deposited metal (according to TB/T2374- 2008)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-40°C
JQ·TH550-NQ- III	Guarantee value	≥550	≥450	≥22	≥60
	Measured value	575	460	29.5	142

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ.SJ105Q is fluorine-alkali sintered flux with high alkalinity of about 3.2. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, excellent slag removal performance in groove, and beautiful weld joint appearance. In addition, the deposited metal has high low temperature impact toughness. It is applicable to DC welding, and the welding wire is connected with the positive pole.

Purpose:The flux is special flux for welding of steel used by bridges. Matched with appropriate welding wires (such as JQ.H08MnE, JQ.H08Mn2E, JQ.H08Mn2R, JQ.CJQ-1 and H60Q), it can be used for welding of a variety of low-alloy bridge steels and steel for pressure vessels.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	15.8	43.4	18.5	22	0.030	0.030

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
JQ·H08MnE	Guarantee value	415~550	≥330	≥22	≥34 (-20°C)
	Measured value	470	380	37	190 (-20°C)
JQ·H08Mn2E	Guarantee value	480~650	≥400	≥22	≥34 (-40°C)
	Measured value	560	450	28.5	174 (-40°C)
JQ·H08Mn2R	Guarantee value	480~650	≥400	≥22	≥34 (-40°C)
	Measured value	580	470	32.5	117 (-40°C)
JQ·CJQ-1	Guarantee value	480~650	≥400	≥22	≥34 (-40°C)
	Measured value	600	529	29	138 (-40°C)
JQ·H60Q	Guarantee value	≥590	≥490	≥17	≥47 (-40°C)
	Measured value	685	580	25.5	96 (-40°C)

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ101D

Conform to GB/T 5293 S 43A 2 FB-SU26
S 49A 4 FB-SU34
Equivalent to AWS A5.17 F6A0-EM12
F7A4-EH14
ISO17174-SA FB 1

Instructions:JQ.SJ101D is fluorine-alkali sintered flux with the alkalinity of about 2.2. It is gray round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). Arc burning is stable during welding, slag removal is easy, the weld joint appearance is beautiful and its deposited metal has high low temperature impact toughness. When DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08MnA, JQ.H10Mn2, JQ.H08MnMoA and JQ.H08Mn2MoA), it can be applied to welding of various low-alloy structural steel, such as hulls, boiler pressure vessels and pipes. It is especially applicable to narrow gap welding and backing welding, and has superior slag removal performance.

Reference composition and measured value of the flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	19.1	43.5	20.3	22.0	0.018	0.023

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
					-20°C	-40°C
					-40°C	
JQ-H08MnA	Guarantee value	430~600	≥330	≥20	≥27	—
	Measured value	485	360	33	115	—
JQ-H10Mn2	Guarantee value	490~670	≥390	≥18	—	≥27
	Measured value	525	425	33	—	115

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ101FNH

Conform to AWS A5.23 F7A4-ECG-G

Instructions:JQ.SJ101FNH is aluminum-alkali sintered flux with the alkalinity of about 2.5. It is white round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). Arc burning is stable during welding, slag removal is easy, and the weld joint appearance is beautiful. When matched with JQ.YJM500FNH submerged-arc flux-cored welding wires, the deposited metal has excellent resistance to rural atmospheric corrosion and meets the requirement of atmospheric corrosion resistance index I>6.5. Meanwhile, it has good impact toughness at low temperature of -40 C.

Purpose:It is used for welding of weathering resistant bridge steel structures of Q235q (D, E) FNH, Q345q (D, E) FNH and Q420q (D, E) FNH grades in rural atmospheric corrosion environment.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	40.2	18.5	15.2	19.3	0.020	0.030

Mechanical properties of deposited metal (according to GB/T 5293-1999)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
					-20°C	-40°C
					-40°C	
JQ·YJM500FNH	Guarantee value	≥500	≥400	≥22.0	≥27	
	Measured value	562	462	27.0	118	

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ101NHY

Conform to AWS A5.23 F7A4-ECG-G



JQ·SJ102

Conform to GB/T 5293 S 49A 4 FB-SU34
S 69A 4 FB-SUM31
Equivalent to AWS A5.17 F7A4-EH14
ISO 14174-SA FB 1

Instructions:JQ.SJ101NHY is aluminum-alkali sintered flux with the alkalinity of about 3.0. It is white round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). Arc burning is stable during welding, slag removal is easy, and the weld joint appearance is beautiful. When matched with JQ.YJM500NHY submerged-arc flux-cored welding wires, the deposited metal is excellent in low temperature toughness while maintaining strength, has excellent resistance to marine atmospheric corrosion and meets the requirement of weathering resistant alloy index V > 1.6.

Purpose:It is used for welding of weathering resistant bridge steel structures of Q235q (D, E) NHY, Q345q (D, E) NHY and Q420q (D, E) NHY grades in marine atmospheric corrosion environment.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.035	≤ 0.040
Measured value	46.5	17.1	14.1	18.3	0.018	0.030

Mechanical properties of deposited metal (according to GB/T 5293-1999)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
					-20°C	-40°C
JQ·YJM500NHY	Guarantee value	≥490	≥400	≥22.0	≥60	≥60
	Measured value	567	465	26.0	125	118

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ.SJ102 is fluorine-alkali sintered flux with high alkalinity of about 3.5. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, excellent slag removal performance in groove, and beautiful weld joint appearance. In addition, the deposited metal has high low temperature impact toughness. It is applicable to DC welding, and the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08MnA, JQ.H10Mn2 and JQ.H08MnMoA), it can be used for welding of a variety of low-alloy structural steels, high-strength hull structural steels and pressure vessel steels. It can be used for multi-pass welding, double-sided single-pass welding, multi-wire welding and narrow-gap submerged arc welding.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	15.5	43.5	18.8	22	0.033	0.032

Mechanical properties of deposited metal (according to GB/T5293 GB/T12470-2003)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-40°C
JQ·H10Mn2	Guarantee value	490~670	≥390	≥18	≥27
	Measured value	550	450	30	136
JQ·H08MnMoA	Guarantee value	620~820	≥500	≥15	≥27
	Measured value	690	585	22	70
JQ·H08Mn2MoA	Guarantee value	690~890	≥550	≥14	≥27
	Measured value	790	675	21.5	55

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ102Ni

Conform to GB/T 5293 S 49A 6 FB-SU34
Equivalent to AWS A5.17 F7A8-EH14
ISO 14174-S A FB 4



JQ•SJ102GQ

Conform to GB/T 12470 S 83A 4 FB-SUM31
Equivalent to ISO 14174-S A FB 1

Instructions:JQ.SJ102Ni is fluorine-alkali sintered flux with high alkalinity of about 3.5. The flux is off-white round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning and beautiful weld joint appearance. In addition, the deposited metal has high low temperature impact toughness. It is applicable to DC welding, and the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H10Mn2, JQ.H08MnMoA and JQ.H08Mn2MoA), it can be used for welding of a variety of low-alloy steels, high-strength hull structural steels and pressure vessel steels.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	16.2	43	17.5	23	0.025	0.023

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-60°C
JQ-H10Mn2	Guarantee value	490~670	≥390	≥18	≥27
	Measured value	580	480	29	76
JQ-H08MnMoA	Guarantee value	550~740	≥460	≥17	≥27

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ.SJ102Ni is fluorine-alkali sintered flux with high alkalinity of about 3.5. The flux is off-white round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning and beautiful weld joint appearance. In addition, the deposited metal has high strength and low temperature impact toughness. It is applicable to DC welding, and the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H10Mn2, JQ.H08MnMoA and JQ.H08Mn2MoA), it can be used for welding of a variety of low-alloy steels, high-strength hull structural steels and pressure vessel steels.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	15.3	43.8	17.5	23	0.026	0.029

Mechanical properties of deposited metal (according to TB/T 12470-2003)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-40°C
JQ-H08Mn2MoA	Guarantee value	830~1030	≥740	≥12	≥27
	Measured value	865	750	15	48

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



Instructions:JQ.SJ105 is fluorine-alkali sintered flux for surfacing with the alkalinity of about 3.5. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, easy slag removal, and beautiful surfacing layer appearance. In addition, the deposited metal has excellent crack resistance. When matched with appropriate wear-resistant submerged-arc welding wire, ideal surface hardness can be obtained. In case of DC welding, the welding wire is connected with the negative pole.

Purpose:Matched with appropriate welding wires (such as WM-210 wear-resistant flux-cored alloy welding wire), it can be used for surfacing of rollers.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	18~22	33~37	10~20	25~30	≤ 0.050	≤ 0.060

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ.SJ105Q is fluorine-alkali sintered flux with high alkalinity of about 3.2. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, excellent slag removal performance in groove, and beautiful weld joint appearance. In addition, the deposited metal has high low temperature impact toughness. It is applicable to DC welding, and the welding wire is connected with the positive pole.

Purpose:The flux is special flux for welding of steel used by bridges. Matched with appropriate welding wires (such as JQ.H08MnE, JQ.H08Mn2E, JQ.H08Mn2R, JQ.CJQ-1 and JQ.H60Q), it can be used for welding of a variety of low-alloy bridge steels and steel for pressure vessels.

Reference composition and measured value of the flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	16.0	45.2	17.8	22	0.030	0.026

Mechanical properties of deposited metal

Matching welding wire	Items	Rm	ReL/Rp0.2	A(%)	KV ₂ (J)
		(MPa)	(MPa)		
JQ•H10MnE	Guarantee value	415~550	≥ 330	≥ 22	≥ 34 (-20°C)
	Measured value	475	375	37	185 (-20°C)
JQ•H08Mn2E	Guarantee value	480~650	≥ 400	≥ 22	≥ 34 (-40°C)
	Measured value	565	460	29	166 (-40°C)
JQ•H08Mn2R	Guarantee value	480~650	≥ 400	≥ 22	≥ 34 (-40°C)
	Measured value	580	470	32.5	117 (-40°C)
JQ•CJQ-1	Guarantee value	480~650	≥ 400	≥ 22	≥ 34 (-40°C)
	Measured value	565	445	30.5	122 (-40°C)
JQ•H60Q	Guarantee value	≥ 590	≥ 490	≥ 17	≥ 47 (-40°C)
	Measured value	695	550	26	116 (-40°C)

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ121T

Conform to AWS A5.23 F9A8-EF1-F1

Instructions:JQ·SJ121T is fluorine-alkali sintered flux with the particle size of 10 - 60 mesh. This flux has stable arc burning during welding, slag removal is easy, the weld joint appearance is beautiful, and its deposited metal has high strength and low temperature impact toughness.

Purpose:Matched with appropriate welding wires (such as JQ.WEF1), it can be used for welding of boiler drums of large power stations whose base metal is WB 36 or HY80, high pressure containers and steam pipes, which not only improves production efficiency, but also saves labor costs.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.050	≤ 0.060
Measured value	28-35	36-45	27-32	0.033	0.037

Mechanical properties of deposited metal (620℃ x 4h heat treatment)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					0℃
JQ·WEF1	Guarantee value	620~760	≥540	≥17	≥60
	Measured value	685	580	24	112、118、115

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ201

Conform to GB/T 5293 S 49A 4 FB-SU34
Equivalent to AWS A5.17 F7A4-EH14
ISO 14174-SA FB 1

Instructions:JQ.SJ201 is aluminum-alkali sintered flux. It is dark gray round particle with the particle size of 2.0 - 0.28mm (10 - 60 mesh). Adopt DCRP and the maximum welding current is 700A. In addition, the arc is stable, the weld joint appearance is beautiful and the slag removal rate is excellent. The deposited metal has high impact toughness.

Purpose:Matched with welding wires such as JQ.H08MnA, JQ.H10Mn2, JQ.H08MnMoA and JQ.H08Mn2MoA, it can be used for welding of a variety of low alloy steels, especially suitable for welding of thick-plate structures with narrow grooves or narrow gap.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	15.5	6	42	36	0.033	0.031

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-40℃
JQ·H10Mn2	Guarantee value	490~670	≥390	≥18	≥27

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ301

Conform to GB/T 5293 S 43A 2 CS-SU08A
S 43A 2 CS-SU26
Equivalent to AWS A5.17 F6A0-EL8
F7A0-EM12
ISO 14174-S A CS 1

Instructions:JQ.SJ301 is silicon-calcium sintered flux with the alkalinity of about 1.0. The flux is black round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, easy slag removal and beautiful weld joint appearance. The molten slag is short slag, and for submerged-arc welding of the short cambered surface, the slag does not flow. Therefore, it is particularly suitable for welding of various types of circumferential welds. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08A,JQ.H08MnA and H08MnMoA), it can be used for welding of ordinary structural steel, as well as steel for boilers and pipes. It can be used for multi-pass welding, double-sided single-pass welding and multi-wire welding, especially applicable to welding of pipes of various diameters.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	—	≤ 0.050	≤ 0.060
Measured value	29.5	24	28.5	17.7	0.031	0.038

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ·H08A	Guarantee value	430~600	≥ 330	≥ 20	≥ 27
	Measured value	485	380	32	86
JQ·H08MnA	Guarantee value	430~600	≥ 330	≥ 20	≥ 27
	Measured value	500	400	32	120

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ402

Conform to GB/T 5293 S 49A 0 FB-SU08A
Equivalent to AWS A5.17 F7AZ-EL8
ISO 14174-S A MS 1

Instructions:JQ.SJ402 is silicon-manganese acid sintered flux with the alkalinity of about 0.7. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, easy slag removal and beautiful weld joint appearance. It is not sensitive to impurities on the weldment, such as rust, oxide film and oil stain during welding. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with JQ.H08A welding wire, it can be used for welding of thin steel plates and medium-thickness steel plate structures made of low carbon steel or some low alloy steel. It is used for welding of metal structures such as rolling stock and mining machinery, especially applicable to high-speed welding of thin plates.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	S	P
Guarantee value	—	—	—	≤ 0.050	≤ 0.060
Measured value	30.5	10.5	58.5	0.045	0.023

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					0°C
JQ·H08A	Guarantee value	490~670	≥ 390	≥ 18	≥ 27
	Measured value	520	410	30	73

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ501

Conform to GB/T 5293 S 43A 0 AR-SU08A
Equivalent to AWS A5.17 F6AZ-EL8
ISO 14174-S AAR 1

Instructions:JQ.SJ501 is aluminum-titanium acid sintered flux with the alkalinity of about 0.5-0.8. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, easy slag removal and beautiful weld joint appearance. The flux has strong anti-porosity and is not sensitive to small amount of rust and high temperature oxide film. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with appropriate welding wires (such as JQ.H08A, JQ.H08MnA and JQ.H08MnMoA), it can be used for welding of low carbon steel and low alloy steel structures, such as ships, boilers and pressure vessels; it is especially applicable to high-speed welding of thin plates.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.050	≤ 0.060
Measured value	30	59	8.8	0.039	0.041

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					0°C
JQ•H08A	Guarantee value	430~600	≥330	≥20	≥27
	Measured value	460	375	29	99

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ303GS

Conform to GB/T 5293 S 43A 2 AR-SU08A
Equivalent to AWS A5.17 F6A0-EL8
ISO 14174-S AAR 1

Instructions:JQ.SJ303GS is aluminum-silicon acid sintered flux with the alkalinity of about 1.0. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, stable arc burning, easy slag removal and beautiful weld joint appearance. The flux has strong anti-porosity and is not sensitive to small amount of rust and high temperature oxide film. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole. The welding speed can reach up to 2m/min

Purpose:Matched with appropriate welding wires (such as JQ.H08A, JQ.H08MnA and JQ.H08MnMoA), it can be used for welding of low carbon steel and low alloy steel structures, such as ships, boilers and pressure vessels; it is especially applicable to high-speed welding of thin plates.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.050	≤ 0.060
Measured value	30	59	8.8	0.022	0.021

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ•H08A	Guarantee value	430~600	≥330	≥20	≥27
	Measured value	450	355	29	100

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ601

Conform to GB/T 17854 S F308 G-S308
Equivalent to ISO 14174-SAZ 2

Instructions:JQ.SJ601 is special alkaline sintered flux for stainless steel and heat resistant steel with the alkalinity of about 1.8. The flux is light green round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh).It is characterized by excellent welding performance, easy slag removal and beautiful weld joint appearance. When matched with corresponding welding wire, the deposited metal has the characteristics of not increasing Si and C, and low Cr and Ni burning loss. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:Matched with welding wires such as JQ.MH308, JQ.MH308L and JQ.MH316L, it can be used for welding of important structures made of stainless steel and high-alloy heat resistant steel.

Reference composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Reference value	5~10	6~10	30~40	40~50	≤ 0.050	≤ 0.060

Mechanical properties of deposited metal (according to GB/T 5293)

Matching welding wire	Items	Rm (MPa)	A(%)
JQ•MH308	Guarantee value	≥520	≥30

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ•SJ602

Conform to NB/T 47018-2017

Instructions:JQ.SJ602 is sintered flux for stainless steel welding strip electroslag surfacing, with the alkalinity of about 4.5. The flux is white round particle with the particle size of 20-80 mesh. It has such advantages as excellent welding performance, easy slag removal and beautiful weld joint appearance. In addition, the deposited metal is characterized by low dilution rate, good corrosion resistance and good wear resistance. Adopt DC power supply and the welding strip is connected with the positive pole during welding.

Purpose:Matched with stainless steel welding strip, it is used for corrosion-resistant and wear-resistant surfacing, as well as welding of nuclear island reactors, hydrogenation reactors, pressure vessels, urea synthesis towers and other important structures.

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



Instructions:JQ.SJ312 is special sintered flux for carbon steel welding strip submerged-arc surfacing, and it is gray round particle with the particle size of 2.0 - 0.28mm (10 - 60 mesh). Arc burning is stable during welding. The flux is sintered submerged-arc flux, it is characterized by excellent slag removal performance at high temperature. In addition, the surface of the weld metal is smooth, flat and beautiful, and the machining allowance after welding is small.

Purpose:Use carbon steel strips containing low S and P, such as JQ.HD04A, and match with special SJ312 sintered flux. It is applied to strip surfacing of low carbon steel and part of low alloy steel.

Measured value of the welding parameter

Items	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)
Measured value	750	30-32	13

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ.SJ34 is fluorine-alkali sintered flux with high alkalinity of about 2.0. The flux is round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It has excellent welding performance, stable arc burning, beautiful weld joint appearance, low metal dilution rate of surfacing layer, good corrosion resistance and wear resistance.

Purpose:The flux is special flux for stainless steel strip surfacing, and can be used with HD308L, HD309L, HD347L and HD316L for important structures, such as hydrogenation reactor and nuclear island reactor stainless steel surfacing.

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ601T

Conform to GB S F308 G-308L
Equivalent to ISO 14174-S A Z 2

Instructions:JQ·SJ601T is special alkaline sintered flux for cryogenic stainless steel with the alkalinity of about 1.8. The flux is light green round particle, with the particle size of 2.0 - 0.28mm (10 - 60 mesh). It is characterized by excellent welding performance, easy slag removal and beautiful weld joint appearance. When matched with corresponding welding wire, the deposited metal has good impact toughness at -196 °C. It can be used under AC and DC, and when DC is selected for welding, the welding wire is connected with the positive pole.

Purpose:It can be matched with cryogenic stainless steel submerged arc welding wires such as JQ·MH308LT and JQ·MH316LT, to weld important structures made of stainless steel and high-alloy heat resistant steel.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	6~11	5~9	35~45	35~45	≤ 0.035	≤ 0.040

Mechanical properties of deposited metal (according to GB/T 17854)

Matching welding wire	Items	Rm (MPa)	A(%)
JQ·MH308LT、JQ·MH316LT	Guarantee value	≥480	≥30
	Measured value		

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



JQ·SJ614

Conform to GB/T 12470 S 49 2 FB-SU1CM2
AWS A5.23 F8P0-EB2R-B2R
NB/T 47018.4-2017

Instructions:JQ·SJ614 is fluorine-alkali sintered flux with the particle size of 10 - 60 mesh. This flux is characterized by low temper brittleness sensitivity, excellent low temperature impact toughness, excellent high temperature mechanical properties and large specification adaptability.

Purpose:Matched with appropriate welding wires (such as JQ.H14Cr1MoR), it can be used for welding of pressure-bearing equipment such as coke towers and gasifiers.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.035	≤ 0.040
Measured value	20-30	30-40	20-35	0.020	0.025

Mechanical properties of deposited metal (690 °C ×20h heat treatment)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-20°C
JQ·H14Cr1MoR	Guarantee value	490~660	≥400	≥20	≥54
	Measured value	565	477	28	196、193、178

Precautions:

- 1.The flux must be baked at 300-350 ° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



Instructions:JQ·SJ616 is fluorine-alkali sintered flux with the alkalinity of about 2.8 and the particle size of 10 - 60 mesh. Content of impurities such as S and P in this flux is low and content of the diffusible hydrogen is also low. In addition, it has good low temperature toughness and can be well formed in small linear energy welding.

Purpose:Matched with appropriate welding wires (such as JQ.H09MnNiDR), it can be used for welding of ASME SA203Gr.B and 09MnNiDR low temperature steel.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.035	≤ 0.040
Measured value	22-32	33-44	21-31	0.015	0.023

Mechanical properties of deposited metal (690℃ ×20h heat treatment)

Matching welding wire	Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
					-70℃
JQ·H09MnNiDR	Guarantee value	480~660	≥ 400	≥ 22	≥ 54
	Measured value	540	450	29	150、162、170

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.

Instructions:JQ·SJ629 is alkaline sintered flux with the particle size of 10 - 60 mesh. The flux has low impurity content and the weld joint has good process performance.

Purpose:Matched with appropriate welding wires (such as ER2209), it can be used for welding of duplex stainless steel, etc.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.060	≤ 0.080
Measured value	20-30	30-40	20-35	0.034	0.050

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment shall be removed before welding.



Instructions:JQ•SJD107 is special sintered flux with the particle size of 10 - 60 mesh. The arc is stable during surfacing, the slag removal is easy, and the weld joint appearance is beautiful.

Purpose:Matched with appropriate flux-cored welding wires (such as JQ.YDM227), it is mainly used for repair of hot rollers and break-down rollers and for manufacturing of composite rollers. It can also be used for surfacing of important parts that are required to have high wear resistance, high temperature oxidation resistance, and resistance to cold and heat fatigue.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.060	≤ 0.080
Measured value	25-32	30-40	25-30	0.034	0.045

Hardness of the deposited metal

Test item	HRC
Typical value	50~55

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment as well as fatigue layer metal shall be removed before welding.

Instructions:JQ•SJ414N is special sintered flux with the particle size of 10 - 60 mesh. The arc is stable during surfacing, the slag removal is easy, and the weld joint appearance is beautiful.

Purpose:Matched with appropriate flux-cored welding wires (such as JQ.YDM414N), it is mainly used for hardfacing of continuous casting rollers.

Chemical composition of flux (%)

Items	SiO ₂ +TiO ₂	Al ₂ O ₃ +MnO	CaF ₂	S	P
Guarantee value	—	—	—	≤ 0.060	≤ 0.080
Measured value	26-30	32-42	26-32	0.035	0.046

Hardness of the deposited metal

Test item	HRC
Typical value	40~48

Precautions:

- 1.The flux must be baked at 300-350° C for 2h before use.
- 2.The rust, oil stain, water and other impurities of the weldment as well as fatigue layer metal shall be removed before welding.



Flux-cored welding wires

Flux-cored welding wires of Golden Bridge Welding Materials are classified into three categories: gas-shielded flux-cored welding wires, self-shielded flux-cored welding wires and submerged-arc flux-cored welding wires, which have the following characteristics respectively:

- (I) Gas-shielded flux-cored welding wires
1. All-position welding is possible under certain welding parameters.
 2. The deposition efficiency is high, and adjustment to the alloy composition is convenient.
 3. The flux core can change the feature of droplet transfer, which can reduce spatter and improve weld joint performance.
 4. CO₂ and molten slag provide protection jointly, which can effectively prevent pores.
 5. The spatter is extremely low.
- (II) Self-shielded flux-cored welding wires
1. All-position welding is possible under certain welding parameters.
 2. The deposition efficiency is high, and adjustment to the alloy composition is convenient.
 3. The penetrating power is strong.
 4. Field construction is not in need of shielding gas, because it has certain wind resistance.
 5. It performs excellent in mechanical properties, especially low temperature impact toughness.
- (III) Submerged-arc flux-cored welding wires
1. Alloy composition adjustment can be performed specific to different types of base metal.
 2. It has a wide range of composition adjustment and can transfer high alloy composition through powder.
 3. The weld joint appearance is beautiful.

Concise table of flux-cored welding wires

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
367	I.CO ₂ -shielded flux-cored welding wires for low carbon steel and high-strength steel of 490MPa grade	JQ•YJ501-1	T492T1-1C1A	E71T-1C	T492T1-1CA	For welding of low carbon steel and low-alloy structural steel with corresponding strength
368		JQ•YJ501-1A	T492T1-1C1A-H5	E71T-1C	T492T1-1CA	For welding of low carbon steel and low-alloy structural steel with corresponding strength
369		JQ•CE71T-1	T492T1-1C1A	E71T-1C	T492T1-1CA	For welding of low carbon steel and low-alloy structural steel with corresponding strength
370		JQ•YJ501-1L	T494T1-1C1A	E71T1-C1A4-CS1	T494T1-1CA	For welding of low carbon steel and low-alloy structural steel with corresponding strength
371		JQ•YJ507-1	T494T5-0C1A	E70T-5C	T494T5-0CA	For welding of important low carbon steel and high-strength steel with corresponding strength
372	II.CO ₂ -shielded flux-cored welding wires for low temperature steel	JQ•YJ501Ni-1	T494T1-1C1A-N2	E71T1-C1A4-Ni1	T494T1-1CA-N2	Welding of low temperature steel and low-alloy structural steel
373		JQ•YJ601Ni-1	T554T1-1C1A-N2	E81T1-C1A4-Ni1	T554T1-1CA-N2	It is used for welding of low-alloy high-strength steel with tensile strength grade of 550MPa
374		JQ•YJ601Ni 1.5-1	T554T1-1C1A-N3	E81T1-C1A4-K2	T554T1-1CA-N3	It is used for welding of low-alloy high-strength steel with tensile strength grade of 550MPa
375		JQ•YJ621K2-1	T624T1-1C1A-N3M1	E91T1-C1A4-K2	T624T1-1CA-N3	It is used for welding of low-alloy high-strength steel with tensile strength grade of 620MPa
376		JQ•YJ621K2-1Q	T624T1-0C1A-N3M1	E90T1-C1A4-K2	T624T1-0CA-N3	It is used for welding of low-alloy high-strength steel with tensile strength grade of 620MPa (metal powder type)



Concise table of flux-cored welding wires

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
377	III. Flux-cored welding wires for atmospheric corrosion resistant steel	JQ•YJ501NiCr Cu-1	E491T1-GC	E71T1-C1 A4-G	—	For welding of atmospheric corrosion resistant steel with tensile strength grade of 490MPa
378		JQ•YJ551NiCr Cu-1	E551T1-W2C	E81T1-C1A4-W2	T553T1-1CA-NCC1	For welding of atmospheric corrosion resistant steel with tensile strength grade of 550MPa
379		JQ•YJ551 NHY-1	E491T1-GC	E71T1-C1 A4-G	—	For welding of marine atmospheric corrosion resistant steel with tensile strength grade of 490MPa
380		JQ•YJM500 NHY	—	ECG	—	For welding of marine atmospheric corrosion resistant steel with tensile strength grade of 490MPa (submerged-arc flux-cored welding wire)
389	IV. Flux-cored welding wires for electro-gas welding	JQ•YJ L50G	—	EG70T-2	YFEG-22C	It is used for vertical welding of the hull and various internal components of the ship, and butt welding of side plates of storage tanks and composite plates of the bridge's box girder, as well as medium-thick-plates of metallurgical blast furnaces.
390		JQ•YJ L60G	—	—	—	It is used for vertical welding of the hull and various internal components of the ship, and butt welding of side plates of storage tanks and composite plates of the bridge's box girder, as well as medium-thick-plates of metallurgical blast furnaces.
391	V. Metal powder type CO ₂ -shielded flux-cored welding wire	JQ•YJ503MX-1	E500T-1	E70T-1C	T492T15-0CA	It is used for single-wire or double-wire downward welding or flat fillet welding and widely applied to shipbuilding and manufacturing of bridge structures and steel structures.

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
392	VI. Flux-cored welding wire for gas-shielded surfacing	JQ•YD132-1	—	—	—	It is used for repair of surface of parts made of low carbon steel, medium carbon steel or low alloy steel, such as surfacing and repair of mining and agricultural machinery
393		JQ•YD172-1	—	—	—	It is used for surfacing of gears, dredgers, tractor scrapers, deepploughing blade ploughs, mining machinery and other wear parts.
394		JQ•YD212-1	—	—	—	It is used for single-layer or multi-layer repair surfacing of the surface of various worn parts such as gears, dredger buckets and mining machinery.
395		JQ•YD397	—	—	—	It is used for surfacing of hot forging die, which makes the die have good hardness and heat fatigue resistance under high temperature.
396		JQ•YD407Cr NiWCo	—	—	—	It is used for surfacing of hot forging die, which makes the die have good hardness and heat fatigue resistance under high temperature.
397		JQ•YD507	—	—	—	It is used for surfacing of hot forging die, which makes the die have good hardness and heat fatigue resistance under high temperature.
398		JQ•YD557	—	—	—	It is used for surfacing of hot forging die, which makes the die have good hardness and heat fatigue resistance under high temperature.
399		JQ•YD55-J	—	—	—	It is applicable to occasions that are resistant to impact and subject to severe wear.
400		JQ•YD60-J	—	—	—	It is applicable to repair of the surface of various worn parts, such as engineering machinery and mining machinery.

Concise table of flux-cored welding wires

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
401	VII. Flux-cored welding wire for Submerged arc surfacing	JQ•YDM227	—	—	—	It is mainly used for repair of hot rollers and break-down rollers, as well as manufacturing of composite rollers
402		JQ•YDM414N	—	—	—	It is mainly used for hardfacing of continuous casting rollers
403	VIII. Self-shielded flux-cored welding wire	JC-26	T49ZT11-1NA	E71T11-AZ-CS3	—	Fine-diameter self-shielded flux-cored welding wires are used for all-position semi-automatic welding of various carbon steels as base metal (mainly thin and galvanized plates)
404		JC-28	T493T8-1NA	E71T-8	—	It is mainly used for welding of bridges, production platforms, hulls and reinforcing ribs
405		JC-29 JC-29X	T493T8-1NA-N1	E71T8-K6	—	JC-29 is especially suitable for on-site welding of API X52 to X65 oil-gas pipelines with high requirement for low temperature toughness. JC-29X is used for on-site welding of ordinary steel and high-strength steel, such as high-rise buildings and blast furnaces.
406		JC-29Ni1	T494T8-1NA-N2	E71T8-Ni1-J	—	It is especially suitable for on-site welding of X52 to X70 oil-gas pipelines with high requirement for low temperature toughness, and can also be used for automatic and semi-automatic welding of ordinary steel, atmospheric corrosion resistant steel and high-strength steel.
407		JC-30	T553T8-1NA-N3	—	—	It is used for welding of weld joints which require high toughness and addition of nickel, especially suitable for on-site welding of API X65 to X80 oil-gas pipelines with high requirement for low temperature toughness.
408		JC-80	T623T8-1NA-GX	E91T8-A2-G	—	It is applicable to on-site welding of X80 and X90 oil-gas pipelines.
409		JCTD-32	EF04-35	—	—	It is used for repair of railway rails (U74, U71Mn, PD3 and rare earth rails) and combined frogs subject to wear, low collapse, bruise and spalling.
410		JCTD-33	—	—	—	It is used for continuous welding of joints between railway rails (U74, U71Mn, PD3 and rare earth rails).

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
411	IX. Metal powder-cored welding wire	JQ-70M	T493T15-1M21A	E70C-6M	—	It can be used for root welding, filling and cosmetic welding of X70 pipelines
412		JQ-80M	T554T15-1M21A-N2	E80C-Ni1	—	It can be used for root welding, filling and cosmetic welding of X80 pipelines
413		JQ-409Ti	TS409-MM211	EC409	—	It is applicable to welding of vehicle exhaust systems and mobile mufflers
414	X. Argon-rich gas shielded flux-cored welding wire for pipeline steel	JQ-81T1M	T554T1-1M21A-N1	E81T1-M21A4-K11	—	It is applicable to all-position semi-automatic and full-automatic welding of X65 and X70 long-distance transport pipelines
415		JQ-91T1M	T623T1-1M21A-N3M1	E91T1-K2M	—	It is applicable to all-position semi-automatic and full-automatic welding of X80 long-distance transport pipelines
416	XI. Stainless steel flux-cored welding wire	JQ-308L	TS308L-FC11	E308LT1-1	—	It is used for welding of 06Cr19Ni10 and 06Cr18Ni11Ti stainless steel structures with working temperature below 300 °C and corrosion resistance
417		LH-308L	TS308L-FC11	E308LT1-1	—	It is used for welding of 06Cr19Ni10 and 06Cr18Ni11Ti stainless steel structures with working temperature below 300 °C, and corrosion resistance. The weld joint maintains the natural color of stainless steel (bright silver)
418		JQ-309L	TS309L-FC11	E309LT1-1	—	It is used for welding of the same type of stainless steel structures, and clad steel and dissimilar steel components, as well as surfacing of the transition layer.



Concise table of flux-cored welding wires

Page	Category	Model of welding wire	Model			Main purpose
			GB	AWS	JIS	
419	XI.Stainless steel flux-cored welding wire	LH-309L	TS309L-FC11	E309LT1-1	—	It is used for welding of the same type of stainless steel structures with carbon steel or low alloy steel as well as surmounting the transition layer. The weld joint maintains the natural color of stainless steel (bright silver). It is used for welding of ultra-low carbon 022Cr17Ni12Mo2 stainless steel, as well as welding of chromium stainless steel clad steel and dissimilar steel that cannot accept heat treatment after welding. It is used for welding of ultra-low carbon 022Cr17Ni12Mo2 stainless steel, as well as welding of chromium stainless steel clad steel and dissimilar steel that cannot accept heat treatment after welding. (bright silver) It is used for backing welding of low alloy steel, heat resistant steel, corrosion resistant steel and coated steel, and welding of dissimilar steel. It is used for welding of low-carbon 18%Cr-12%Ni-2%Mo-Ni-3%Mo stainless steel (SUS316LN, etc.) and low carbon 19%Cr-13%Ni stainless steel (SUS317, etc.) and low-carbon 18%Cr-8%Ni-11%stainless steel (SUS321, etc.) It is used for all-position welding of 2205 series duplex stainless steel welding It is used for welding of cryogenic stainless steel of corresponding materials It is used for welding of cryogenic stainless steel of corresponding materials
420		JQ-316L	TS316L-FC11	E316LT1-1	—	
421		LH-316L	TS316L-FC11	E316LT1-1	—	
422		JQ-309MoL	TS309L-Mo-FC11	E309LMoT1-1	—	
423		JQ-317L	TS317L-FC11	E317LT1-1	—	
424		JQ-347L	TS347L-FC11	E347T1-1	—	
425		JQ-2209	TS2209-FC11	E2209T1-1	—	
426		JQ-308LT	TS308L-FC11	E308LT1-1	—	
427		JQ-316LT	TS316L-FC11	E316LT1-1	—	



JQ·YJ501-1

Conform to GB/T 10045-2018 T492T1-1C1A
Equivalent to AWS A5.36 E71T-1C
Equivalent to JIS Z3313 T492T1-1CA
Equivalent to ISO 17632-B-T492T1-1CA

Instructions: JQ.YJ501-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding and horizontal welding, and allows all-position welding with high welding efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness, good crack resistance and stable and reliable internal quality.

Purpose: It is applicable to welding of shipbuilding, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030
Measured value	0.05	1.36	0.41	0.008	0.012

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	560	480	27	145

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

X-ray radiographic inspection requirements: Level II

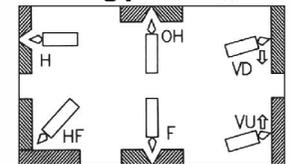
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.0	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~250	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~210	120~260	150~270	180~280
	Vertical down welding	200~250	200~300	220~300	250~300
	Horizontal welding	120~230	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ•YJ501-1A

Conform to GB/T 10045-2018 T492T1-1C1A-H5
 Equivalent to AWS A5.36 E71T-1C
 Equivalent to JIS Z3313 T492T1-1CA
 Equivalent to ISO 17632-B-T492T1-1CA

Instructions:JQ.YJ501-1A is titanium-oxide ultra-low-hydrogen CO₂-shielded flux-cored welding wire, and the diffusible hydrogen content of deposited metal is less than 5ml/100g. It is characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding and horizontal welding, and allows all-position welding with high welding efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness, good crack resistance and stable and reliable internal quality.

Purpose:It is applicable to welding of shipbuilding, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030
Measured value	0.05	1.38	0.38	0.008	0.012

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	550	475	28	150

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤5ml/100g

X-ray radiographic inspection requirements: Level II

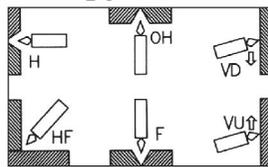
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.0	Φ 1.2	Φ 1.4
Current range (A)	Downward welding	120~250	120~300	150~400
	Vertical up welding and over-head welding	120~210	120~260	150~270
	Vertical down welding	200~250	200~300	220~300
	Horizontal welding	120~230	120~280	150~320

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



JQ•CE71T-1

Conform to GB/T 10045-2018 T492T1-1C1A
 Equivalent to AWS A5.36 E71T-1C
 Equivalent to JIS Z3313 T492T1-1CA
 Equivalent to ISO 17632-B-T 492T1-1CA

Instructions:JQ.CE71T-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding and horizontal welding, and allows all-position welding with high welding efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness, good crack resistance and stable and reliable internal quality.

Purpose:It is applicable to welding of shipbuilding, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030
Measured value	0.05	1.28	0.39	0.010	0.016

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	550	470	27	115

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

X-ray radiographic inspection requirements: Level II

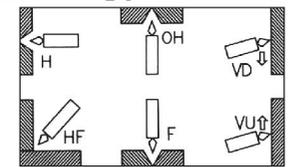
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJ501-1L

Conform to GB/T 10045-2018 T494T1-1C1A
 Equivalent to AWS A5.36 E71T1-C1A4-CS1
 Equivalent to JIS Z3313 T494T1-1CA
 Equivalent to ISO 17632-B-T 494T1-1CA

Instructions:JQ.YJ501-1L is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding and horizontal welding, and allows all-position welding with high welding efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of shipbuilding, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel in important positions.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030	≤0.50
Measured value	0.05	1.28	0.35	0.009	0.011	0.42

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	560	490	28	130

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

X-ray radiographic inspection requirements: Level II

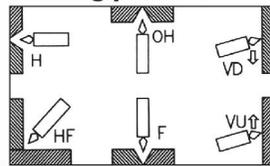
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	200~300	250~300
	Horizontal welding	120~230	120~280	180~350

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



JQ·YJ507-1

Conform to GB/T 10045-2018 T494T5-0C1A
 Equivalent to AWS A5.36 E70T-5C
 Equivalent to JIS Z3313 T494T5-0CA

Instructions:JQ.YJ507-1 is calcium oxide-calcium fluoride CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding, flat fillet welding, and horizontal weaving welding to improve production efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of shipbuilding, pressure vessel, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel in important positions.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030
Measured value	0.07	1.48	0.34	0.010	0.015

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	570	480	31	160

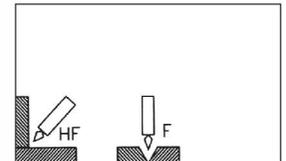
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Flat fillet welding	120~300	150~400	180~450

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJ501Ni-1

Conform to GB/T 10045-2018 T494T1-1C1A-N2
 Equivalent to AWS A5.36 E71T1-C1A4-Ni1
 Equivalent to JIS Z3313 T494T1-1CA-N2
 Equivalent to ISO 17632-B-T494T1-1CA-N2

Instructions:JQ.YJ501Ni-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. It is applicable to downward welding and horizontal welding, and allows all-position welding with high welding efficiency. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of shipbuilding, machinery manufacturing, petroleum machinery, chemical machinery and lifting machinery made of carbon steel and low-alloy structural steel in important positions.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	0.80~1.20	≤0.35
Measured value	0.04	1.28	0.38	0.006	0.011	0.90	—

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	570	510	27	120

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

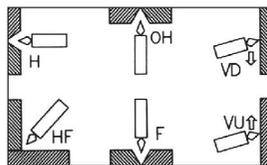
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



JQ·YJ601Ni-1

Conform to GB/T 10045-2018 T554T1-1C1A-N2
 Equivalent to AWS A5.36 E81T1-C1A4-Ni1
 Equivalent to JIS Z3313 T554T1-1CA-N2
 Equivalent to ISO 17632-B-T554T1-1CA-N2

Instructions:JQ.YJ601Ni-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. All-position welding is possible and the welding efficiency is high. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of structures made of low-alloy highstrength steel with tensile strength grade of 550MPa, such as lifting machinery, bridges and steel frame structures.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	0.80~1.20	≤0.35
Measured value	0.04	1.32	0.38	0.009	0.015	0.90	—

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	550~740	≥460	≥17	≥27
Measured value	620	560	25	105

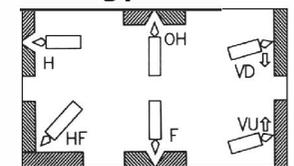
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJ601Ni1.5-1

Conform to GB/T 10045-2018 T554T1-1C1A-N3
 Equivalent to AWS A5.36 E81T1-C1A4-K2
 Equivalent to JIS Z3313 T554T1-1CA-N3
 Equivalent to ISO 17632-B-T554T1-1CA-N3

Instructions:JQ.YJ601Ni1.5-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. All-position welding is possible and the welding efficiency is high. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of structures made of low-alloy highstrength steel with tensile strength grade of 550MPa, such as lifting machinery, bridges and steel frame structures.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni	Mo
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	1.00~2.00	≤0.35
Measured value	0.04	1.35	0.35	0.008	0.012	1.40	—

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	550~740	≥460	≥17	≥27
Measured value	620	540	26	102

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

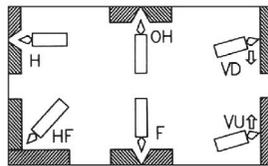
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



JQ·YJ621K2-1

Conform to GB/T 36233-2018 T624T1-1C1A-N3M1
 Equivalent to AWS A5.36 E91T1-C1A4-K2
 Equivalent to JIS Z3313 T624T1-1CA-N3
 Equivalent to ISO 17632-B-T624T1-1CA-N3

Instructions:JQ.YJ621K2-1 is titanium-oxide CO₂-shielded flux-cored welding wire, characterized by excellent welding performance, soft and stable arc, low spatter, easy slag removal and beautiful weld joint appearance. All-position welding is possible and the welding efficiency is high. After toughening treatment with microelements, the deposited metal has excellent low temperature toughness and good crack resistance.

Purpose:It is applicable to welding of low-alloy high-strength steel structures, such as lifting machinery, bridges and steel frame structures.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni	Mo	V
Guarantee value	≤0.15	0.50~1.75	≤0.80	≤0.030	≤0.030	1.00~2.00	≤0.35	≤0.05
Measured value	0.04	1.45	0.39	0.006	0.010	1.35	—	—

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	620~820	≥530	≥15	≥27
Measured value	658	595	26	90

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

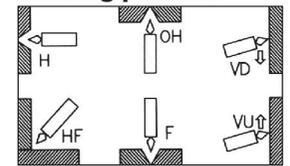
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and overhead welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJ621K2-1Q

Conform to GB/T 36233-2018 T624T1-0C1A-N3M1
 Equivalent to AWS A5.36 E90T1-C1A4-K2
 Equivalent to JIS Z3313 T624T1-0CA-N3
 Equivalent to ISO 17632-B-T624T1-0CA-N3

Instructions: JQ.YJ621K2-1Q is metal powder-cored welding wire and applicable to automatic welding, semi-automatic welding, single-pass welding and multi-pass welding; It is characterized by high deposition efficiency, low welding spatter, little slag and stable arc. It has excellent resistance to primer and porosity.

Purpose: It is applicable to downward welding and flat fillet welding of structures such as shipbuilding, bridges, automobile manufacturing and steel beams.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Mn	Si	S	P	Ni	Cr	Mo	V
Guarantee value	≤0.15	0.50~1.75	≤0.80	≤0.030	≤0.030	1.00~2.00	≤0.15	≤0.35	≤0.05
Measured value	0.04	1.60	0.44	0.007	0.012	1.45	—	—	—

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	620~820	≥530	≥15	≥27
Measured value	650	570	26	80

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

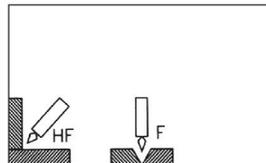
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	150~350	170~400	200~450
	Flat fillet welding	180~350	200~350	270~400

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



JQ·YJ501NiCrCu-1

Conform to GB/T 10045-2018 T494T1-1C1A-NCC2
 Equivalent to AWS A5.36 E71T1-C1A4-G

Instructions: JQ.YJ551NiCrCu-1 is titanium-oxide CO₂-shielded weathering resistant steel flux-cored welding wire, characterized by excellent welding performance, stable arc, easy slag removal, beautiful weld joint appearance and high welding efficiency, and applicable to downward welding and horizontal welding. It allows all-position welding and its deposited metal has excellent atmospheric corrosion resistance.

Purpose: It is applicable to welding of structures made of 09CuPCrNi, 09CuTiRe and 09CuPre steel, such as railway rolling stock, containers and bridges.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Si	Mn	S	P	Ni	Cr	Cu
Guarantee value	≤0.12	0.20~0.80	0.80~1.60	≤0.030	≤0.030	0.30~0.80	0.10~0.40	0.20~0.50
Measured value	0.042	0.33	1.25	0.009	0.010	0.61	0.24	0.35

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	596	525	25.5	80

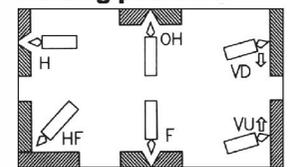
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJ551NiCrCu-1

Conform to GB/T10045-2018 T554T1-1C1A-NCC3
 Equivalent to AWS A5.36 E81T1-C1A4-W2
 Equivalent to JIS Z3320 T554T1-1CA-NCC1



JQ·YJ551NHY-1

Conform to GB/T 10045-2018 T494T1-1C1A-GX
 Equivalent to AWS A5.36 E71T1-C1A4-G

Instructions:JQ.YJ551NiCrCu-1 is titanium-oxide CO₂-shielded weathering resistant steel flux-cored welding wire, characterized by excellent welding performance, stable arc, easy slag removal, beautiful weld joint appearance and high welding efficiency, and applicable to downward welding and horizontal welding. It allows all-position welding and its deposited metal has excellent atmospheric corrosion resistance.

Purpose:It is applicable to welding of weathering resistant steel structures with tensile strength of 550N/mm², such as railway rolling stock, offshore engineering and bridges.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Si	Mn	S	P	Ni	Cr	Cu
Guarantee value	≤0.12	0.20~0.80	0.80~1.60	≤0.030	≤0.030	0.30~0.80	0.45~0.75	0.20~0.50
Measured value	0.04	0.40	1.20	0.008	0.012	0.64	0.50	0.38

Mechanical properties of deposited metal (shielding gas: CO₂)

Test	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	550~740	≥460	≥17	≥27
Measured value	610	540	24	90

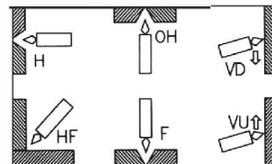
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position



Instructions:JQ.YJ551NHY-1 is flux-cored welding wire for titaniumoxide CO₂-shielded marine atmospheric corrosion resistant steel, characterized by excellent welding performance, stable arc, easy slag removal, beautiful weld joint appearance and high welding efficiency, and applicable to downward welding and horizontal welding. It allows all-position welding and its deposited metal has excellent marine atmospheric corrosion resistance.

Purpose:It is applicable to welding of marine atmospheric corrosion resistant steel, such as offshore engineering and bridges.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Si	Mn	S	P	Ni	Mo	Cu
Guarantee value	≤0.10	≤0.50	≤1.50	≤0.015	≤0.020	2.80~3.80	Proper amount	0.30~0.75

Mechanical properties of deposited metal (shielding gas: CO₂)

Test	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)
				-40 C
Guarantee value	≥490	≥400	≥22	≥60
Measured value	597	525	25	130

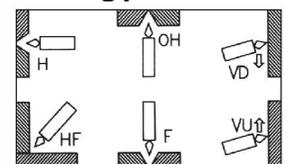
Reference current (DC⁺)

		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	120~300	150~400	180~450
	Vertical up welding and over-head welding	120~260	150~270	180~280
	Vertical down welding	200~300	220~300	250~300
	Horizontal welding	120~280	150~320	180~350

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The gas flow during welding is generally 20-25 L/min.
- When flux-cored welding wires are used for welding, the length of wire extension shall be 15-25 mm.
- The humidity of the welding wire warehouse shall be maintained less than 60%.
- The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





JQ·YJM500NHY

Conform to AWS A5.32 ECG



JQ·YJL50G

Conform to JIS Z3319 YFEG-22C
Equivalent to AWS A5.26 EG70T-2

Instructions:JQ·YJM500NHY is submerged-arc flux-cored welding wire for marine atmospheric corrosion resistant steel. Matched with JQ·SJ101NHY sintered flux, while ensuring strength, the deposited metal also has excellent low temperature toughness, excellent marine atmospheric corrosion resistance, and meet the requirement of weathering resistant alloy index $V \geq 1.6$.

Purpose:It is used for welding of marine atmospheric corrosion resistant steel with tensile strength of 500N/mm^2 , such as offshore engineering and bridges.

Chemical composition of deposited metal (%) (shielding gas: CO₂)

Items	C	Si	Mn	S	P	Ni	Mo	Cu
Guarantee value	≤ 0.10	≤ 0.50	≤ 1.50	≤ 0.015	≤ 0.025	2.80~ 3.80	Proper amount	0.30~ 0.75

Mechanical properties of deposited metal (shielding gas: CO₂)

Test	Rm (N/mm ²)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40C
Guarantee value	≥ 490	≥ 400	≥ 22	≥ 60
Measured value	567	465	26	118

Reference current (DC⁺)

Welding wire diameter (mm)	$\Phi 4.0$
Current range (A)	450~550

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The humidity of the welding wire warehouse shall be maintained less than 60%

Instructions:JQ·YJL50G is flux-cored welding wire for electro-gas welding. It is characterized by excellent welding performance, stable arc, low spatter, easy slag removal and beautiful weld joint appearance. The vertical up welding method is adopted, the weld joint is formed at a time, and the welding efficiency is high.

Purpose:It is used for vertical welding of the hull and various internal components of the ship, and butt welding of side plates of storage tanks and composite plates of the bridge's box girder, as well as medium-thick-plates of metallurgical blast furnaces.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Si	Mn	S	P	Mo	Ti	Ni
Guarantee value	≤ 0.18	≤ 0.70	≤ 2.00	≤ 0.030	≤ 0.030	≤ 0.50	≤ 0.05	≤ 0.80
Measured value	0.06	0.25	1.45	0.007	0.012	0.15	0.03	0.50

Mechanical properties of deposited metal

Test	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20C
Guarantee value	≥ 520	≥ 390	≥ 20	≥ 40
Measured value	580	470	25	90

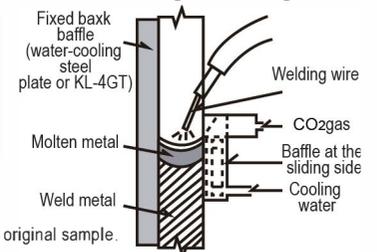
Size of the welding test piece

Specification(mm)	Specifications of the test piece (mm)	Angle (°)	Gap(mm)
1.6	500 × 150 × 20	22.5	5

Reference current (DC⁺)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)
1.6	320~400	32~40

Schematic diagram of electro-gas welding:



Note: Refer to the legend in the original sample.



JQ·YJL60G

Conform to Enterprise Standard Q12DJ5507-2017

Instructions:JQ.YJL60G is flux-cored welding wire for electro-gas welding. It is characterized by excellent welding performance, stable arc, low spatter, easy slag removal and beautiful weld joint appearance. The vertical up welding method is adopted, the weld joint is formed at a time, and the welding efficiency is high.

Purpose:It is used for vertical welding of the hull and various internal components of the ship, and butt welding of side plates of storage tanks and composite plates of the bridge's box girder, as well as medium-thick-plates of metallurgical blast furnaces.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Si	Mn	S	P	Ni	Cr	Mo	Ti
Guarantee value	≤0.15	≤0.50	≤2.00	≤0.025	≤0.025	≤2.00	≤0.25	≤0.50	≤0.10
Measured value	0.06	0.19	1.41	0.005	0.010	1.35	0.014	0.14	0.05

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	≥610	≥490	≥20	≥47
Measured value	645	538	24	120

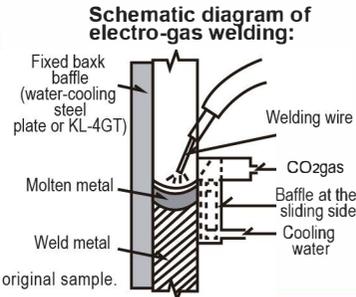
Size of the welding test piece

Specification(mm)	Specifications of the test piece (mm)	Angle (°)	Gap(mm)
1.6	500×150×20	22.5	5

Reference current (DC⁺)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)
1.6	320~400	32~40

Note: Refer to the legend in the original sample.



JQ·YJ503MX-1

Conform to GB/T 10045-2018 T492T1-0C1A
Equivalent to AWS A5.36 E70T-1C
Equivalent to JIS Z3313 T492T15-0CA
Equivalent to ISO 17632-B-T492T15-0CA

Instructions:JQ.YJ503MX-1 is metal powder-cored welding wire and applicable to automatic welding, semi-automatic welding, single-pass welding and multi-pass welding; It is characterized by high deposition efficiency, low welding spatter, little slag and stable arc. It has excellent resistance to primer and porosity.

Purpose:It is applicable to downward welding and flat fillet welding of structures such as shipbuilding, bridges, automobile manufacturing and steel beams.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Mn	Si	S	P
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030
Measured value	0.05	1.50	0.54	0.007	0.011

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -20 C
Guarantee value	490~670	≥390	≥18	≥27
Measured value	580	490	27	115

Diffusible hydrogen content of deposited metal (thermal conductivity method): ≤10ml/100g

X-ray radiographic inspection requirements: Level II

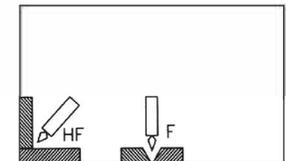
Reference current (DC⁺)

Welding wire diameter (mm)		Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	Downward welding	150~350	170~400	200~450
	Flat fillet welding	180~350	200~350	270~400

Precautions:

1. The workpiece to be welded shall be subject to oil and rust removal.
2. The gas flow during welding is generally 20-25 L/min.
3. When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
4. The humidity of the welding wire warehouse shall be maintained less than 60%.
5. The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Welding position





Instructions:JQ.YD132-1 is CO₂-shielded CrMo flux-cored welding wire for surfacing. Arc for surfacing is stable and slag removal is easy.

Purpose:It is applicable to occasions that are resistant to impact and subject to moderate wear. It is used for repair of surface of parts made of low carbon steel, medium carbon steel or low alloy steel, such as surfacing and repair of mining and agricultural machinery.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Cr	Mo
Guarantee value	≤0.50	≤3.00	≤1.50

Hardness of the surfacing layer: HRC≥30

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.It shall be properly preheated to about 300 °C before surfacing large workpiece.
- 5.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 6.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Instructions:JQ.YD172-1 is CO₂-shielded CrMo flux-cored welding wire for surfacing. Arc for surfacing is stable and slag removal is easy.

Purpose:It is applicable to occasions that are resistant to impact and subject to moderate wear. It is used for surfacing of gears, dredger buckets, tractor scrapers, deep-ploughing blade ploughs, mining machinery and other wear parts.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Cr	Mo
Guarantee value	≤0.50	≤2.50	≤2.50

Hardness of the surfacing layer: HRC≥40

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.It shall be properly preheated to about 300 °C before surfacing large workpiece.
- 5.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 6.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.



Instructions:JQ.YD212-1 is CO₂-shielded CrMo flux-cored welding wire for surfacing. Arc for surfacing is stable and slag removal is easy.

Purpose:It is applicable to occasions that are resistant to impact and subject to severe wear. It is used for single-layer or multi-layer repair surfacing of the surface of various worn parts such as gears, dredger buckets and mining machinery.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Cr	Mo
Guarantee value	0.30~0.60	≤5.00	≤4.00

Hardness of the surfacing layer: HRC≥50

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.It shall be properly preheated to about 300 °C before surfacing large workpiece.
- 5.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 6.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Instructions:JQ.YD397 is gas-shielded flux-cored welding wire for surfacing, for which, the shielding gas is mixed gas of Ar+20%CO₂. It has good welding performance, stable arc, low spatter, easy slag removal and no crack. It has very good high temperature hardness and stable use performance. The test piece shall be preheated to about 400 °C before welding, and tempered at about 550 °C after welding.

Purpose:It is mainly used for surfacing of hot forging dies. The base metal of the die is 5CrNiMo and 5CrMnMo, which makes the die have good hardness and heat fatigue resistance under high temperature.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Mn	Si	Cr	Mo	Ni
Guarantee value	≤0.30	≤3.00	≤0.80	1.00~3.00	≤2.00	≤5.00

Hardness of the deposited metal: (Shielding gas: Ar+20%CO₂)

Test item	HRC
Typical value	36~42

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 5.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.



Instructions:JQ.YD407CrNiWCo is gas-shielded flux-cored welding wire for surfacing, for which, the shielding gas is mixed gas of Ar+20%CO₂. It has good welding performance, stable arc, low spatter, easy slag removal and no crack. It has very good high temperature hardness and stable use performance. The test piece shall be preheated to about 200 C before welding, and tempered at about 550 C after welding.

Purpose:It is mainly used for surfacing of hot forging dies. The base metal of the die is 5CrNiMo and 5CrMnMo, which makes the die have good hardness and heat fatigue resistance under high temperature.

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Mn	Si	Cr	Mo	Ni	W	Co	V
Guarantee value	≤ 0.40	≤ 3.00	≤ 0.50	1.50~2.00	≤ 1.00	≤ 2.00	1.50~2.50	≤ 2.00	≤ 0.80

Hardness of the deposited metal

Test item	HRC
Typical value	43~47

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 5.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Instructions:JQ.YD507 is CO₂-shielded flux-cored welding wire for surfacing, characterized by good welding performance, stable arc, low spatter, easy slag removal and no crack. It has very good high temperature hardness and stable use performance. The test piece shall be preheated to about 200 C before welding, and tempered at about 550 C after welding.

Purpose:It is mainly used for surfacing of hot forging dies. The base metal of the die is 5CrNiMo and 5CrMnMo, which makes the die have good hardness and heat fatigue resistance under high temperature.

Chemical composition of deposited metal (%) (Shielding gas: Ar+20% CO₂)

Items	C	Mn	Si	Cr	Mo	Ni	W	Co	V
Guarantee value	≤ 0.40	≤ 3.00	≤ 0.50	2.50~3.50	≤ 1.00	≤ 2.00	1.50~2.50	≤ 2.00	≤ 0.80

Hardness of the deposited metal

Test item	HRC
Typical value	48~52

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 5.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.



Instructions:JQ.YD557 is gas-shielded flux-cored welding wire for surfacing, for which, the shielding gas can be CO₂ or mixed gas of Ar+20%CO₂. It has good welding performance, stable arc, low spatter, easy slag removal and no crack. It has very good high temperature hardness and stable use performance. The test piece shall be preheated to about 200 °C before welding, and tempered at about 550 °C after welding.

Purpose:It is mainly used for surfacing of hot forging dies. The base metal of the die is 5CrNiMo and 5CrMnMo, which makes the die have good hardness and heat fatigue resistance under high temperature.

Chemical composition of deposited metal (%) (Shielding gas: Ar+20%CO₂)

Items	C	Mn	Si	Cr	Mo	Ni	W	Co
Guarantee value	≤ 0.60	≤ 3.00	≤ 0.80	2.00~4.00	≤ 2.00	≤ 1.00	6.50~8.50	≤ 2.00

Hardness of the deposited metal

Test item	HRC
Typical value	53~57 (55±2)

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 5.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Instructions:JQ.YD55-J is gas-shielded alkaline flux-cored welding wire for surfacing. Arc for surfacing is stable and slag removal is easy. This product has good crack resistance and is not prone to cracking in multilayer surfacing.

Purpose:It is applicable to occasions that are resistant to impact and subject to severe wear. It is used for single-layer or multi-layer repair surfacing of the surface of various worn parts such as gears, dredger buckets, engineering machinery and mining machinery.

Chemical composition of deposited metal (%) (Shielding gas: Ar+20%CO₂)

Items	C	S	Mn	Si	P	Cr	Mo
Guarantee value	0.40~0.70	≤ 0.030	≤ 2.00	≤ 2.00	≤ 0.030	4.0~8.0	≤ 2.00

Hardness of the surfacing layer: HRC≥50

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the dry elongation length shall be 15-25 mm.
- 4.It shall be properly preheated to about 300 °C before surfacing large workpiece.
- 5.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 6.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.



Instructions:JQ.YD60-J is gas-shielded alkaline flux-cored welding wire for surfacing. The product is used for surfacing on the low carbon steel substrate by 4-5mm, and the hardness of the surfacing layer can reach about HRC60; This product is not suitable for multi-layer surfacing. Due to the high hardness of the surfacing layer, multi-layer surfacing is prone to cracking.

Purpose:It is applicable to repair of the surface of various worn parts, such as engineering machinery and mining machinery.

Chemical composition of deposited metal (%) (Shielding gas: Ar+20%CO₂)

Items	C	Mn	Si	Cr	W	Mo
Guarantee value	0.50~ 1.20	≤ 3.00	≤ 2.00	4.0~ 8.0	2.0~ 4.0	0.8~ 2.0

Hardness of the surfacing layer: HRC≥58

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 1.2	Φ 1.4	Φ 1.6
Current range (A)	180~260	200~280	220~300

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The gas flow during welding is generally 20-25 L/min.
- 3.When flux-cored welding wires are used for welding, the length shall be 15-25 mm.
- 4.It shall be properly preheated to about 300 °C before surfacing large workpiece.
- 5.The humidity of the welding wire warehouse shall be maintained less than 60%.
- 6.The storage time of non-vacuum packaged welding wires shall not exceed half a year, and that of vacuum packaged welding wires shall not exceed one year.

Instructions:JQ·YDM227 is submerged-arc flux-cored welding wire for roller surfacing. The welding wire has strong crack resistance and its deposited metal has excellent wear resistance and strong fatigue resistance. When matched with JQ·SJD107 sintered flux for welding, the arc is stable, slag removal is easy, and the weld joint appearance is beautiful.

Purpose:It is mainly used for repair of hot rollers and break-down rollers, as well as manufacturing of composite rollers. It can also be used for surfacing of important parts that are required to have high wear resistance, high temperature oxidation resistance, and resistance to cold and heat fatigue.

Chemical composition of deposited metal (%)

Items	C	Mn	Cr	Mo	W	V	S	P
Guarantee value	0.20~ 0.50	1.00~ 2.00	6.00~ 8.00	0.50~ 1.50	1.50~ 2.50	0.30~ 0.60	≤ 0.030	≤ 0.030

Matching flux: JQ·SJD107

Hardness of the deposited metal

Test item	HRC
Typical value	50~55

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 3.2	Φ 4.0
Current range (A)	350~450	400~500

Precautions:

- 1.The workpiece to be welded shall be subject to oil and rust removal.
- 2.The humidity of the welding wire warehouse shall be maintained less than 60%.



JQ·YDM414N

Instructions:JQ·YDM414N is submerged-arc flux-cored welding wire for roller surfacing. The welding wire has good corrosion resistance, wear resistance and thermal impact resistance. When matched with JQ·SJ414N sintered flux for welding, the arc is stable, slag removal is easy, and the weld joint appearance is beautiful.

Purpose:It is mainly used for hardfacing of continuous casting rollers.

Chemical composition of deposited metal (%)

Items	C	S	Mn	Si	P	Cr	Ni	Mo	N
Guarantee value	0.05~	≤	1.00~	≤	≤	12.00~	3.00~	0.40~	0.05~
value	0.15	0.030	2.00	1.50	0.030	15.00	5.00	1.00	0.15

Matching flux: JQ·SJ414N

Hardness of the deposited metal

Test item	HRC
Typical value	40~48

Reference current (DC⁺)

Welding wire diameter (mm)	Φ 3.2	Φ 4.0
Current range (A)	350~450	400~500

Precautions:

- The workpiece to be welded shall be subject to oil and rust removal.
- The humidity of the welding wire warehouse shall be maintained less than 60%.



JC-26

Conform to GB/T 10045-2018 T49ZT11-1NA
AWS A5.36 E71T11-AZ-CS3

Instructions:JC-26 is fine-diameter self-shielded flux-cored welding wire, which adopts DCSP. It is characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, small amount of smoke, simple operation and good operative weldability.

Purpose:It is used for all-position semi-automatic welding of various carbon steel base metal (mainly thin and galvanized plates), and is applicable to convenient operation at home.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Al
Guarantee value	≤0.30	≤2.00	≤0.90	≤0.030	≤0.030	≤2.00
Measured value	0.22	0.62	0.23	0.007	0.008	1.42

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)
Guarantee value	490~670	≥390	≥18
Measured value	620	450	23

Reference current (DC⁻)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)
Φ 0.8	60~130	14~21
Φ 0.9	60~150	15~22
Φ 1.0	60~150	15~22

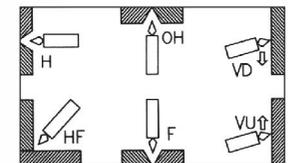
Specifications of supplied goods:

Φ 0.8mm、Φ 0.9mm、Φ 1.0mm

Packaging of supplied goods:

- Plastic tray, net weight 1Kg/tray, 10 trays/box
- Other packaging agreements

Welding position





JC-28

Conform to GB/T 10045-2018 T493T8-1NA
AWS A5.20 E71T-8

Instructions:JC-28 is carbon steel self-shielded flux-cored welding wire, not in need of shielding gas. It is characterized by excellent low temperature toughness of weld joints, high deposition efficiency, arc in spraying shape with large penetrating power, easy operation, beautiful weld joint appearance and easy slag removal. Adopt DCSP and all-position welding is suitable.

Purpose:JC-28 is mainly used for welding of bridges, production platforms, hulls and reinforcing ribs.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Al
Guarantee value	≤0.30	≤2.00	≤0.90	≤0.030	≤0.030	≤2.00
Measured value	0.047	1.50	0.26	0.003	0.011	0.90

Mechanical properties of deposited metal

Items	R _m (MPa)	Re _L /R _{p0.2} (MPa)	A(%)	KV ₂ (J) -30℃
Guarantee value	490~670	≥390	≥18	≥27
Measured value	525	434	26	110、115、120

Reference current (DC⁻)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)	Wire feeding speed (in/min)
Φ 1.6	120~150	16~21	60~100
Φ 2.0	150~230	17~22	60~110

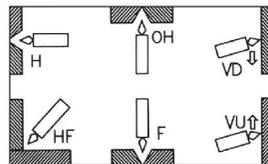
Specifications of supplied goods:

Φ 1.6mm、Φ 2.0mm

Packaging of supplied goods:

1. Plastic tray, net weight 6Kg/tray
2. Barreled, 4 trays, net weight 24Kg/barrel
3. Other packaging agreements

Welding position



JC-29 JC-29X

Conform to GB/T 10045-2018 T493T8-1NA-N1
AWS A5.29 E71T8-K6

Equivalent to GB/T 10045-2018 T493T8-1NA-N1
AWS A5.29 E71T8-K6

Instructions:JC-29 and JC-29X are low-alloy steel self-shielded flux-cored welding wires, not in need of shielding gas. It is characterized by excellent low temperature toughness of weld joints, high deposition efficiency, arc in spraying shape with large penetrating power, easy operation, beautiful weld joint appearance and easy slag removal. Adopt DCSP and all-position welding is suitable. Since the molten slag solidifies quickly, it is particularly suitable for vertical down welding.

Purpose:JC-29 is especially suitable for on-site welding of API X52 to X65 oil-gas pipelines with high requirement for low temperature toughness. JC-29X is used for on-site welding of ordinary steel and highstrength steel, such as high-rise buildings and blast furnaces.

Chemical composition of deposited metal (%)

Items	Model	C	Mn	Si	S	P	Ni	Mo	Al
Guarantee value		≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	0.30~1.00	≤0.35	≤1.80
Measured value	JC-29	0.046	1.27	0.26	0.004	0.013	0.60	0.012	0.85
Measured value	JC-29X	0.054	1.34	0.34	0.005	0.015	0.50	0.011	0.90

Mechanical properties of deposited metal

Items	Model	R _m (MPa)	Re _L /R _{p0.2} (MPa)	A(%)	KV ₂ (J) -30℃
Guarantee value		490~670	≥390	≥18	≥27
Measured value	JC-29	531	437	28	146、154、164
Measured value	JC-29X	542	445	26	123、134、146

Reference current (DC⁻)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)	Wire feeding speed (in/min)
Φ 1.6	120~150	16~21	60~100
Φ 2.0	150~230	17~22	60~110

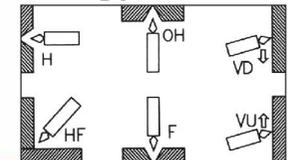
Specifications of supplied goods:

Φ 1.6mm、Φ 2.0mm

Packaging of supplied goods:

1. Plastic tray, net weight 6Kg/tray
2. Barreled, 4 trays, net weight 24Kg/barrel
3. Other packaging agreements

Welding position





JC-29Ni1

Conform to GB/T 10045-2018 T494T8-1NA-N2
AWS A5.29 E71T8-Ni1-J

Instructions:JC-29Ni1 is low-alloy steel self-shielded flux-cored welding wire, not in need of shielding gas. Because the deposited metal contains 0.80% (1.10%) of Ni, it has excellent low temperature toughness and good crack resistance. It is characterized by high deposition efficiency, arc in spraying shape with large penetrating power, easy operation, beautiful weld joint appearance and easy slag removal. Adopt DCSP and all-position welding is suitable. Since the molten slag solidifies quickly, it is particularly suitable for vertical down welding. It can be used for welding of thick plates and important structures with high rigidity.

Purpose:It is used for welding of weld joints which require high toughness and addition of nickel, especially suitable for on-site welding of API X52 to X70 oil-gas pipelines with high requirement for low temperature toughness. It can also be used for automatic and semiautomatic welding of ordinary steel, atmospheric corrosion resistant steel and high strength steel, such as oil and gas transport pipelines, offshore platforms and storage tanks.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Ni	Mo	Al
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	0.80~1.20	≤0.35	≤1.80
Measured value	0.038	1.15	0.20	0.003	0.006	0.99	0.02	0.81

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J)	
				-30 C	-40 C
Guarantee value	490~670	≥390	≥18	≥27	≥27
Measured value	515	420	27	175、180、178	135、145、150

Reference current (DC ~)

Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)	Wire feeding speed (in/min)
Φ 1.6	120~150	16~21	60~100
Φ 2.0	150~230	17~22	60~110

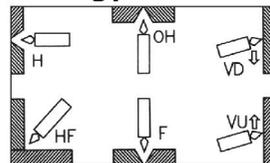
Specifications of supplied goods:

Φ 1.6mm、Φ 2.0mm

Packaging of supplied goods:

1. Plastic tray, net weight 6Kg/tray
2. Barreled, 4 trays, net weight 24Kg/barrel
3. Other packaging agreements

Welding position



JC-30

Conform to GB/T 10045-2018 T553T8-1NA-N3

Instructions:JC-30 is low-alloy steel self-shielded flux-cored welding wire, not in need of shielding gas. Low Ni content in the deposited metal makes it have excellent low temperature toughness and good crack resistance. It is characterized by high deposition efficiency, arc in spraying shape with large penetrating power, easy operation, beautiful weld joint appearance and easy slag removal. Adopt DCSP and all-position welding is suitable. Since the molten slag solidifies quickly, it is particularly suitable for vertical down welding. It can be used for welding of thick plates and important structures with high rigidity.

Purpose:It is used for welding of weld joints which require high toughness and addition of nickel, especially suitable for on-site welding of API X65 to X80 oil-gas pipelines with high requirement for low temperature toughness.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Ni	Mo	Al
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	1.00~2.00	≤0.35	≤1.80
Measured value	0.034	1.33	0.21	0.004	0.008	1.62	0.027	0.83

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	550~740	≥460	≥17	≥27
Measured value	585	500	26	156、165、175

Reference current (DC ~)

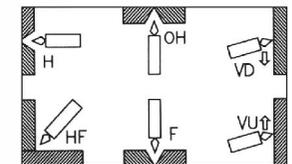
Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)	Wire feeding speed (in/min)
Φ 2.0	150~230	17~22	60~110

Specifications of supplied goods: Φ 2.0mm

Packaging of supplied goods:

1. Plastic tray, net weight 6Kg/tray
2. Barreled, 4 trays, net weight 24Kg/barrel
3. Other packaging agreements

Welding position





JC-80

Conform to GB/T 36233-2018 T623T8-1NA-GX
AWS A5.36 E91T8-A2-G

Instructions:JC-80 is low-alloy steel self-shielded flux-cored welding wire specially developed for the new X80 pipeline steel. It has excellent and stable low temperature toughness and good crack resistance. It is characterized by high deposition efficiency, arc in spraying shape with large penetrating power, easy operation, beautiful weld joint appearance and easy slag removal. Adopt DCSP and all-position welding is suitable. Since the molten slag solidifies quickly, it is particularly suitable for vertical down welding.

Purpose:It is applicable to on-site welding of X80 and X90 oil-gas pipelines.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P
Guarantee value	≤0.15	1.00~2.00	≤0.40	≤0.030	≤0.030
Measured value	0.040	1.42	0.016	0.003	0.008
Items	Ni	Cr	Al	Mo	V
Guarantee value	3.00~5.00	≤0.20	≤1.80	≤0.20	≤0.05
Measured value	3.88	0.025	1.00	0.013	0.002

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30℃
Guarantee value	620~820	≥530	≥15	≥27
Measured value	685	600	22	110、121、125

Reference current (DC ~)

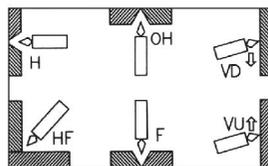
Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)	Wire feeding speed (in/min)
Φ 2.0	150~260	17~23	60~100

Specifications of supplied goods: Φ 2.0mm

Packaging of supplied goods:

1. Plastic tray, net weight 6Kg/tray
2. Barreled, 4 trays, net weight 24Kg/barrel
3. Other packaging agreements

Welding position



JCTD-32

Conform to TB/T EF04-35

Instructions:JCTD-32 self-shielded flux-cored welding wire adopts DCSP for welding (which means the welding wire is connected with the negative pole). The arc is in spraying shape, the spatter is low and it has good welding performance. In addition, it is characterized by continuous wire feeding, strong wind resistance, not in need of gas shielding, high production efficiency, low comprehensive cost and good welding quality.

Purpose:It is applicable to repair of railway rails (U74, U71Mn, PD3 and rare earth rails) and combined frogs subject to wear, low collapse, bruise and spalling.

Chemical composition of deposited metal (%)

Items	C	Si	Mn	Cr	Ni	Mo	S	P	Al
Guarantee value	≤0.15	≤0.50	0.80~1.10	0.70~1.50	2.00~3.00	0.40~0.70	≤0.030	≤0.030	≤2.00
Measured value	0.12	0.35	1.01	0.90	2.11	0.45	0.002	0.015	1.02

Mechanical properties of deposited metal

Items	Rm (MPa)	A(%)	Aku(J) Normal temperature	Brinell hardness (HB)
Guarantee value	≥700	≥15	≥27	300~350
Measured value	865	17	93、95、89	332

Specifications of supplied goods: Φ 1.6mm

Precautions:

1. Use upon unpacking.
2. When it is used for repair welding of steel rails, rails shall be preheated at 350-400℃.
3. DCSP is adopted for welding.



Conform to GB/T 10045-2018 T493T15-1M21A
AWS A5.18 E70C-6M

Instructions:JCTD-33 self-shielded flux-cored welding wire adopts DCSP for welding (which means the welding wire is connected with the negative pole). The arc is in spraying shape, the spatter is low and it has good welding performance. In addition, it is characterized by strong wind resistance, not in need of gas shielding and continuous wire feeding. It can be used to achieve full-automatic welding of track bond with high production efficiency, low comprehensive cost and good welding quality.

Purpose:It is applicable to continuous welding of joints between railway rails (U74, U71Mn, PD3 and rare earth rails).

Chemical composition of deposited metal (%)

Items	C	Si	Mn	Cr	Ni	Mo	S	P	Al
Guarantee value	≤0.15	≤0.50	≤1.50	0.50~1.50	1.00~2.00	0.30~0.70	≤0.030	≤0.030	≤2.00

Mechanical properties of deposited metal

Items	Rm (MPa)	A(%)	Aku(J) Normal temperature
Guarantee value	≥830	≥10	≥27

Specifications of supplied goods: Φ2.0mm

Precautions:

1. Use upon unpacking.
2. DCSP is adopted for welding.

Instructions:JQ-80M metal powder-cored welding wires have advantages of solid welding wires, such as little slag and high efficiency and those of ordinary flux-cored welding wires, such as fast melting speed, low spatter and good welding performance. At the same time, the arc has large penetrating power, the weld joint appearance is beautiful and welding is high-speed and high-efficiency. The deposited metal has low diffusible hydrogen content, and excellent low temperature impact performance and crack resistance.

Purpose:It is applicable to semi-automatic and full-automatic welding of long-distance transport pipelines. It can be used for root welding, filling and cosmetic welding of X70 pipeline steel and applied to standard automated production of automobile, engineering machinery and other industries.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Mo	Ni
Guarantee value	≤0.18	≤2.00	≤0.90	≤0.030	≤0.030	≤0.30	≤0.50
Measured value	0.027	1.42	0.58	0.007	0.007	0.002	0.035

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	490-670	≥390	≥18	≥27
Measured value	545	458	29.5	150、147、138

Shielding gas: Ar+20%CO₂

Welding specification :

Diameter (mm)	Polarity	Current (A)	Voltage (V)
Φ 1.2	DCRP	140-300	16-32



JQ-80M

Conform to GB/T 10045-2018 T554T15-1M21A-N2
AWS A5.28 E80C-Ni1

Instructions:JQ-80M metal powder-cored welding wires have advantages of solid welding wires, such as little slag and high efficiency and those of ordinary flux-cored welding wires, such as fast melting speed, low spatter and good welding performance. At the same time, the arc has large penetrating power, the weld joint appearance is beautiful and welding is high-speed and high-efficiency. The deposited metal has low diffusible hydrogen content, and excellent low temperature impact performance and crack resistance.

Purpose:It is applicable to semi-automatic and full-automatic welding of long-distance transport pipelines. It can be used for root welding, filling and cosmetic welding of X80 pipeline steel and applied to standard automated production of automobile, engineering machinery and other industries.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Mo	Ni
Guarantee value	≤0.12	≤1.75	≤0.80	≤0.030	≤0.030	≤0.35	0.80~1.20
Measured value	0.061	0.96	0.27	0.008	0.009	0.13	0.88

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	550-740	≥460	≥17	≥27
Measured value	639	562	29	100、132、121

Shielding gas: Ar+20%CO₂

Welding specification:

Diameter (mm)	Polarity	Current (A)	Voltage (V)
Φ 1.2	DCRP	140-300	16-32



JQ-409Ti

Conform to GB/T 17853-2018 TS409-MM211
AWS A5.22 EC409

Instructions:JQ-409Ti is a kind of metal powder-cored welding wire for stainless steel. Due to the addition of appropriate amount of Ti in the welding wire, the molten bath has good fluidity, and the weld metal has good oxidation and corrosion resistance. It is characterized by soft and stable welding arc, low spatter, almost no slag, beautiful weld joint appearance, high deposition efficiency, stable wire feeding, and excellent welding performance.

Purpose:It is applicable to welding of vehicle exhaust systems and mobile mufflers

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Mo	Cu	Cr	Ni	Ti
Guarantee value	≤0.08	≤0.80	≤0.80	≤0.030	≤0.030	≤0.75	≤0.75	10.5~13.5	≤0.60	10%~1.5
Measured value	0.02	0.43	0.52	0.006	0.008	0.015	0.020	11.5	0.006	0.80

Mechanical properties of deposited metal

Test	Rm (MPa)	A(%)
Measured value	475	18

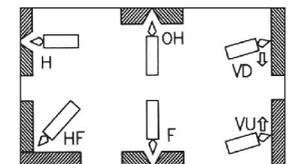
Shielding gas: 98% Ar+2%O₂ or pure Ar

Welding specification:

Diameter (mm)	Polarity	Current (A)	Voltage (V)
1.2	DCRP	120-280	17-32

Specifications of supplied goods: Φ 1.2mm

Welding position





JQ-81T1M

Conform to GB/T 10045-2018 T554T1-1M21A-N1
AWS A5.36 E81T1-M21A4-K11

Instructions:JQ-81T1M is applicable to vertical up all-position welding. In the welding process, molten droplets are small and of spray transfer, the arc is soft and stable, the amount of smoke is small and there is almost no spatter. In addition, it is easy to remove slag, and it has good depth of fusion, as well as flat and beautiful weld joint appearance. It has good mechanical properties and crack resistance, and the ductile-brittle transition temperature is $-50\text{ }^{\circ}\text{C}$.

Purpose:It is applicable to all-position semi-automatic and fullautomatic welding of X65 and X70 long-distance transport pipelines.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	P	Mo	Ni
Guarantee value	≤ 0.15	≤ 1.75	≤ 0.80	≤ 0.030	≤ 0.030	≤ 0.35	0.30~1.00
Measured value	0.045	1.43	0.27	0.008	0.014	0.01	0.70

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -40 C
Guarantee value	550~740	≥ 460	≥ 17	≥ 27
Measured value	613	540	25.5	136、141、127

Shielding gas: Ar+20%CO₂

Reference current (DC⁺)

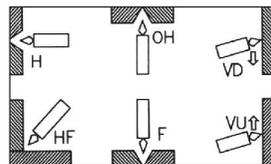
Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)
$\Phi 1.2$	140~300	16~32

Specifications of supplied goods: $\Phi 1.2\text{mm}$

Packaging of supplied goods:

1. Plastic tray, net weight 5Kg/tray
2. Barreled, 5 trays, net weight 25Kg/barrel
3. Other packaging agreements

Welding position



JQ-91T1M

Conform to GB/T 36233-2018 T623T1-1M21A-N3M1
AWS A5.29 E91T1-K2M

Instructions:JQ-91T1M is applicable to vertical up all-position welding. In the welding process, molten droplets are small and of spray transfer, the arc is soft and stable, the amount of smoke is small and there is almost no spatter. In addition, it is easy to remove slag, and it has good depth of fusion, as well as flat and beautiful weld joint appearance. It has good mechanical properties and crack resistance, especially stable low temperature toughness. Its ductile-brittle transition temperature is $-45\text{ }^{\circ}\text{C}$.

Purpose:It is applicable to all-position semi-automatic and fullautomatic welding of X80 long-distance transport pipelines.

Chemical composition of deposited metal (%)

Items	C	Mn	Si	S	Cr	P	Mo	Ni	V
Guarantee value	≤ 0.15	0.50~1.75	≤ 0.80	≤ 0.030	≤ 0.15	≤ 0.030	≤ 0.35	1.00~2.00	≤ 0.05
Measured value	0.043	1.28	0.25	0.006	0.023	0.008	0.005	1.78	0.017

Mechanical properties of deposited metal

Items	Rm (MPa)	ReL/Rp0.2 (MPa)	A(%)	KV ₂ (J) -30 C
Guarantee value	620~820	≥ 530	≥ 15	≥ 27
Measured value	650	580	24.0	105、112、109

Shielding gas: Ar+20%CO₂

Reference current (DC⁺)

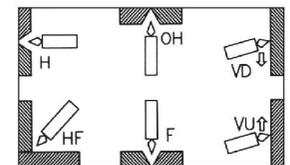
Welding wire diameter (mm)	Welding current (A)	Welding voltage (V)
$\Phi 1.2$	140~300	16~32

Specifications of supplied goods: $\Phi 1.2\text{mm}$

Packaging of supplied goods:

1. Plastic tray, net weight 5Kg/tray
2. Barreled, 5 trays, net weight 25Kg/barrel
3. Other packaging agreements

Welding position





JQ-308L

Conform to GB/T 17853-2018 TS308L-FC11
AWS A5.22 E308LT1-1



LH-308L

Conform to GB/T 17853-2018 TS308L-FC11
AWS A5.22 E308LT1-1

Instructions:JQ-308L is CO₂ - shielded stainless steel flux-cored welding wire, characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, good welding performance and all-position welding. The deposited metal has good mechanical properties and resistance to intergranular corrosion.

Purpose:It is used for welding of 06Cr19Ni10 and 06Cr18Ni11Ti stainless steel structures with working temperature below 300 °C and corrosion resistance It is used for welding of stainless steel materials such as 301, 302, 304, 304L, 308 and 308L.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

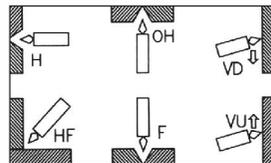
Items	C	Mn	Si	Ni	Cr	S	P	Mo	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	9.0~12.0	18.0~21.0	≤0.030	≤0.040	≤0.75	≤0.75
Measured value	0.029	1.40	0.36	10.3	19.33	0.003	0.023	0.024	0.022

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	550	43.5

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position



Instructions:LH-308L is CO₂ - shielded stainless steel flux-cored welding wire. The outstanding feature of this product lies with that the weld joint appearance retains the original color of stainless steel (bright silver), without oxidization tint after welding and is smooth and beautiful, which reduces the cleaning procedure of weld joint after welding of conventional stainless steel welding materials. In addition, it also has good welding performance, such as soft and stable arc, low spatter and easy slag removal. The deposited metal has good mechanical properties and resistance to intergranular corrosion.

Purpose:It is used for welding of 06Cr19Ni10 and 06Cr18Ni11Ti stainless steel structures with working temperature below 300 °C and corrosion resistance It is used for welding of stainless steel materials such as 301, 302, 304, 304L, 308, and 308L, and especially suitable for occasions where there are high requirements for weld joint appearance.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

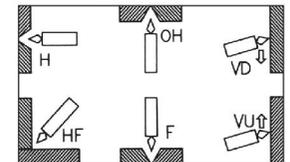
Items	C	Mn	Si	Ni	Cr	S	P	Mo	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	9.0~12.0	18.0~21.0	≤0.030	≤0.040	≤0.75	≤0.75
Measured value	0.022	1.42	0.42	10.02	19.12	0.003	0.020	0.020	0.021

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	548	44.5

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position





JQ-309L

Conform to GB/T 17853-2018 TS309L-FC11
AWS A5.22 E309LT1-1

Instructions:JQ-309L is CO₂ - shielded stainless steel flux-cored welding wire, characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, good welding performance and all-position welding. The deposited metal has good crack resistance.

Purpose:It is used for welding of the same type of stainless steel structures, clad steel and dissimilar steel components manufactured by synthetic fiber and petrochemical equipment, as well as surfacing of the transition layer of the inner wall of nuclear reactor and pressure vessel and welding of components inside the tower.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

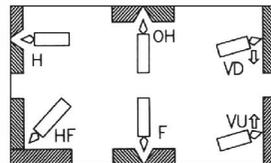
Items	C	Mn	Si	Ni	Cr	S	P	Mo	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	12.0~14.0	22.0~25.0	≤0.030	≤0.040	≤0.75	≤0.75
Measured value	0.035	1.25	0.58	12.40	24.15	0.004	0.023	0.02	0.02

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	560	41.5

Specifications of supplied goods: Φ 1.2mm Φ 1.4mm Φ 1.6mm

Welding position



LH-309L

Conform to GB/T 17853-2018 TS309L-FC11
AWS A5.22 E309LT1-1

Instructions:LH-316L is CO₂ - shielded stainless steel flux-cored welding wire. The outstanding feature of this product lies with that the weld joint appearance retains the original color of stainless steel (bright silver), without oxidization tint after welding and is smooth and beautiful, which reduces the cleaning procedure of weld joint after welding of conventional stainless steel welding materials. In addition, it also has good welding performance, such as soft and stable arc, low spatter and easy slag removal. The deposited metal has good crack resistance.

Purpose:It is used for welding of the same type of stainless steel structures, clad steel and dissimilar steel components manufactured by synthetic fiber and petrochemical equipment, as well as surfacing of the transition layer of the inner wall of nuclear reactor and pressure vessel and welding of components inside the tower, especially suitable for occasions where there are high requirements for weld joint appearance.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

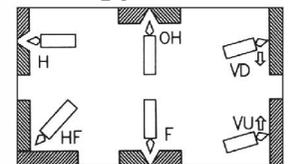
Items	C	Mn	Si	Ni	Cr	S	P	Mo	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	12.0~14.0	22.0~25.0	≤0.030	≤0.040	≤0.75	≤0.75
Measured value	0.024	1.27	0.59	12.48	23.66	0.004	0.019	0.02	0.02

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	565	37.5

Specifications of supplied goods: Φ 1.2mm Φ 1.4mm Φ 1.6mm

Welding position





JQ-316L

Conform to GB/T 17853-2018 TS316L-FC11
AWS A5.22 E316LT1-1



LH-316L

Conform to GB/T 17853-2018 TS316L-FC11
AWS A5.22 E316LT1-1

Instructions:JQ-316L is CO₂-shielded stainless steel flux-cored welding wire with good welding performance and allows all-position welding. The deposited metal has good heat, corrosion and crack resistance.

Purpose:It is used for welding of ultra-low carbon 022Cr17Ni12Mo2 stainless steel, as well as welding of chromium stainless steel, clad steel and dissimilar steel that cannot accept heat treatment after welding.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

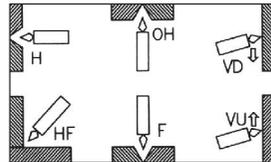
Items	C	Mn	Si	Ni	Cr	Mo	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	11.0~14.0	17.0~20.0	2.0~3.0	≤0.030	≤0.040	≤0.75
Measured value	0.031	1.30	0.35	12	18.65	2.42	0.005	0.023	0.025

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥485	≥25
Measured value	540	42.5

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position



Instructions:LH-316L is CO₂-shielded stainless steel flux-cored welding wire. The outstanding feature of this product lies with that the weld joint appearance retains the original color of stainless steel (bright silver), without oxidization tint after welding and is smooth and beautiful, which reduces the cleaning procedure of weld joint after welding of conventional stainless steel welding materials. In addition, it also has good welding performance, such as soft and stable arc, low spatter and easy slag removal. The deposited metal has good heat, corrosion and crack resistance.

Purpose:It is used for welding of ultra-low carbon 022Cr17Ni12Mo2 stainless steel, as well as welding of chromium stainless steel, clad steel and dissimilar steel which cannot accept heat treatment after welding, especially suitable for occasions where there are high requirements for weld joint appearance.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

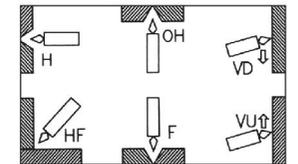
Items	C	Mn	Si	Ni	Cr	Mo	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	11.0~14.0	17.0~20.0	2.0~3.0	≤0.030	≤0.040	≤0.75
Measured value	0.022	1.47	0.49	12.07	18.48	2.51	0.003	0.020	0.025

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥485	≥30
Measured value	545	40.5

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position





JQ-309MoL

Conform to GB/T 17853-2018 TS309LMo-FC11
AWS A5.22 E309LMoT1-1

Instructions:JQ-309MoL is CO₂ - shielded stainless steel flux-cored welding wire, characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, good welding performance and all-position welding. The deposited metal has good mechanical properties and resistance to intergranular corrosion.

Purpose:It is used for welding of stainless steel containers of the same type that are resistant to sulfuric acid medium (ammonium sulfate) corrosion, as well as welding of stainless steel lining, clad steel and dissimilar steel.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

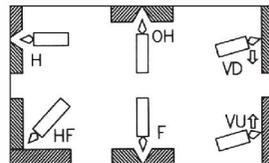
Items	C	Mn	Si	Ni	Cr	Mo	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	12.0~16.0	21.0~25.0	2.0~3.0	≤0.030	≤0.040	≤0.75
Measured value	0.031	1.40	0.56	12.50	23.00	2.32	0.004	0.022	0.02

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥15
Measured value	680	32

Specifications of supplied goods: Φ1. 2mm Φ1. 4mm Φ1. 6mm

Welding position



JQ-317L

Conform to GB/T 17853-2018 TS317L-FC11
AWS A5.22 E317LT1-1

Instructions:JQ-317L is CO₂ - shielded stainless steel flux-cored welding wire, characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, good welding performance and allposition welding. Since the austenite structure of the deposited metal contains ferrite, it has good crack resistance.

Purpose:It is applicable to welding of low-carbon 18%Cr-12%Ni-2%Mo-N stainless steel (SUS316LN, etc.), and low carbon 19%Cr-13%Ni-3%Mo stainless steel (SUS317L, etc.).

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

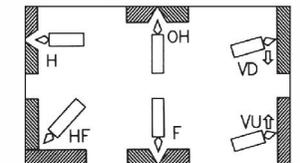
Items	C	Mn	Si	Ni	Cr	Mo	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	12.0~14.0	18.0~21.0	3.0~4.0	≤0.030	≤0.040	≤0.75
Measured value	0.030	1.25	0.56	13	19.15	3.4	0.004	0.021	0.018

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥20
Measured value	565	38

Specifications of supplied goods: Φ1. 2mm Φ1. 4mm Φ1. 6mm

Welding position





JQ-347L

Conform to GB/T 17853-2018 TS347L-FC11
AWS A5.22 E347T1-1

Instructions:JQ-347L is CO₂ - shielded stainless steel flux-cored welding wire, characterized by soft and stable arc, low spatter, beautiful appearance, easy slag removal, good welding performance and all-position welding. Nb content in JQ-347L can effectively improve its corrosion resistance, especially the intergranular corrosion resistance.

Purpose:It is applicable to welding of 18%Cr-8%Ni-Nb stainless steel (SUS347, etc.), and low-carbon 18%Cr-8%Ni-Ti stainless steel (SUS321, etc.).

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

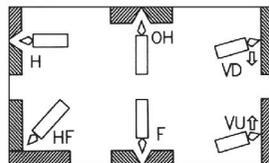
Items	C	Mn	Si	Ni	Cr	Nb+Ta	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	9.0~11.0	18.0~21.0	8×C~1.0	≤0.030	≤0.040	≤0.75
Measured value	0.029	1.33	0.69	10.46	19.57	0.48	0.003	0.021	0.02

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥520	≥25
Measured value	590	40.5

Specifications of supplied goods: Φ 1.2mm Φ 1.4mm Φ 1.6mm

Welding position



JQ-2209

Conform to GB/T 17853-2018 TS2209-FC11
AWS A5.22 E2209T1-1

Instructions:JQ-2209 is CO₂ - shielded stainless steel flux-cored welding wire whose main composition is 22Cr-9Ni-3Mo-N. As an austenitic-ferritic duplex stainless steel flux-cored welding wire, it allows all-position welding. Since austenite phase is well-balanced with ferrite phase in the deposited metal, the deposited metal combines the comprehensive properties of austenitic stainless steel with the stress corrosion resistance of ferritic stainless steel. It has good welding performance - stable arc, beautiful appearance, extremely low spatter and high X-Ray pass rate.

Purpose:It is applicable to welding of UNS S31803 (namely, SUS2205) duplex stainless steel in petrochemical and marine engineering fields.

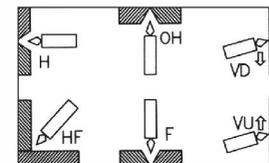
Chemical composition of deposited metal (%) (Shielding gas: CO₂)

Items	C	Mn	Si	Ni	Cr	Mo	S	P	N	Cu
Guarantee value	≤0.04	0.50~2.00	≤1.00	7.5~10.0	21.0~24.0	2.5~4.0	≤0.030	≤0.040	0.08~0.20	≤0.75
Measured value	0.034	1.14	0.50	9.24	22.45	3.4	0.005	0.022	0.12	0.01

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)
Guarantee value	≥690	≥15
Measured value	820	26

Welding position





JQ-308LT

Conform to GB/T 17853-2018 TS308L-FC11
AWS A5.22 E308LT1-1

Instructions:JQ-308LT is stainless steel flux-cored welding wire specially designed for ultra-low temperature cryogenic welding. The arc is soft and stable, the molten droplets are small and of even transition, the spatter is extremely low, the slag removal is easy, the welding performance is good, and all-position welding is possible. The weld metal structure is optimized, and it has good and stable low temperature impact performance at ultralow temperature of -196 C , meeting the rigorous requirement that the lateral expansion of the impact specimen shall be >0.38mm.

Purpose:It is mainly used for welding of 304L, 308L and other stainless steel structural materials used in CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment fields under cryogenic environment.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

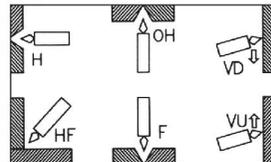
Items	C	Mn	Si	Ni	Cr	S	P	Mo	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	9.0~12.0	18.0~21.0	≤0.030	≤0.040	≤0.75	≤0.75
Measured value	0.027	1.39	0.39	10.1	19.12	0.003	0.025	0.020	0.020

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)	KV ₂ (J) -196 C
Guarantee value	≥520	≥25	≥31
Measured value	548	38	39、42、40

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position



JQ-316LT

Conform to GB/T 17853-2018 TS316L-FC11
AWS A5.22 E316LT1-1

Instructions:JQ-316LT is stainless steel flux-cored welding wire specially designed for ultra-low temperature cryogenic welding. The arc is soft and stable, the molten droplets are small and of even transition, the spatter is extremely low, the slag removal is easy, the welding performance is good, and all-position welding is possible. The weld metal structure is optimized, and it has good and stable low temperature impact performance at ultralow temperature of -196 C , meeting the rigorous requirement that the lateral expansion of the impact specimen shall be >0.38mm.

Purpose:It is mainly used for welding of 316 and 316L stainless steel structural materials used in CNG (compressed natural gas), LNG (liquefied natural gas) and LPG (liquefied petroleum gas) storage and transportation equipment fields under cryogenic environment.

Shielding gas: CO₂

Chemical composition of deposited metal (%) (Shielding gas: CO₂)

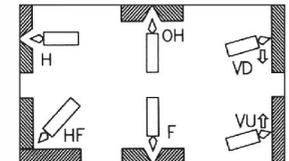
Items	C	Mn	Si	Ni	Cr	Mo	S	P	Cu
Guarantee value	≤0.04	0.50~2.50	≤1.00	11.0~14.0	17.0~20.0	2.00~3.00	≤0.030	≤0.040	≤0.75
Measured value	0.028	1.32	0.38	11.98	18.42	2.39	0.006	0.022	0.02

Mechanical properties of deposited metal (shielding gas: CO₂)

Items	Rm (MPa)	A(%)	KV ₂ (J) -196 C
Guarantee value	≥485	≥25	≥31
Measured value	543	39	41、40、41

Specifications of supplied goods: Φ1.2mm Φ1.4mm Φ1.6mm

Welding position





Aluminum and aluminum alloy welding wires

Relying on a series of advantages, such as light weight, low price and recyclability, aluminum profiles are widely applied to railway locomotives, electrical, chemical and food machinery, welding or surfacing in light alloy processing industry, ships, sports equipment, dies, furniture, containers, bicycles, aluminum scooters, chemical pressure vessels, military equipment production, nuclear industry, refrigeration industry, boilers and other fields. Accordingly, the above industries will also use corresponding aluminum and aluminum alloy welding wire.

Gas shielded welding wire model and executive standard

Page	Product model	National standard and model	American standard and model
428	JQ•SAI4043	GB/T 10858-2008 SAI 4043	A5.10 ER4043
429	JQ•SAI4047	GB/T 10858-2008 SAI 4047	A5.10 ER4047
430	JQ•SAI5356	GB/T 10858-2008 SAI 5356	A5.10 ER5356
431	JQ•SAI5183	GB/T 10858-2008 SAI 5183	A5.10 ER5183
432	JQ•SAI5087	GB/T 10858-2008 SAI 5087	—

Argon arc welding wire model and executive standard

Product model	National standard and model	American standard and model
JQ•HS4043	GB/T 10858-2008 SAI 4043	A5.10 ER4043
JQ•HS4047	GB/T 10858-2008 SAI 4047	A5.10 ER4047
JQ•HS5356	GB/T 10858-2008 SAI 5356	A5.10 ER5356
JQ•HS5183	GB/T 10858-2008 SAI 5183	A5.10 ER5183
JQ•HS5087	GB/T 10858-2008 SAI 5087	—

Instructions: SAI4043 is a kind of aluminum-silicon welding wire with large universality whose deposited metal has good hot crack resistance while maintaining certain mechanical properties. However, in case of anodizing, the weld metal is different in color from the base metal.

Purpose: It is applicable to welding of aluminum alloy workpieces and castings other than aluminum-magnesium alloy. In addition, it can be applied to ships, chemical, food, automobile manufacturing, vessel, container manufacturing and other industries.

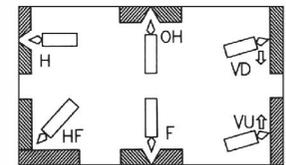
Chemical composition of welding wire (%)

Items	Si	Fe	Cu	Mn
Guarantee value	4.50-6.00	≤0.80	≤0.30	≤0.05
Measured value	5.18	0.15	0.009	0.009
Items	Mg	Zn	Ti	Be
Guarantee value	≤0.05	≤0.10	≤0.20	≤0.0003
Measured value	0.007	0.005	0.068	0.0001

Precautions:

1. Impurities such as oxide film and oil stain on the welding edge of the workpiece and the surface of the welding wire shall be thoroughly removed before welding.
2. In the welding process, a subplate can be used to hold the molten metal to ensure formation of the weld joint.
3. Oxyacetylene gas welding must be matched with aluminum gas welding flux.

Welding position





JQ·SAI4047

Conform to GB/T 10858 SAI 4047
AWS A5.10 ER4047

Instructions:SAI4047 is aluminum-silicon eutectic alloy welding wire, with weldability and weld joint characteristics similar to those of SAI4043. It has excellent welding performance, the weld joint appearance is beautiful and bright, the arc is stable and the spatter is low.

Purpose:It is applicable to welding of cast aluminum and aluminumsilicon, aluminum-magnesium, aluminum-magnesium-silicon, aluminummanganese and other alloys.

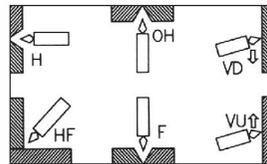
Chemical composition of welding wire (%)

Items	Si	Fe	Cu	Mn
Guarantee value	11.0-13.0	≤0.80	≤0.30	≤0.15
Measured value	12.1	0.13	0.007	0.011
Items	Mg	Zn	Be	
Guarantee value	≤0.10	≤0.20	≤0.0003	
Measured value	0.009	0.005	0.0001	

Precautions:

1. Impurities such as oxide film and oil stain on the welding edge of the workpiece and the surface of the welding wire shall be thoroughly removed before welding.
2. In the welding process, a subplate can be used to hold the molten metal to ensure formation of the weld joint.
3. Oxyacetylene gas welding must be matched with aluminum gas welding flux.

Welding position



JQ·SAI5356

Conform to GB/T 10858 SAI 5356
AWS A5.10 ER5356

Instructions:SAI5356 is aluminum-magnesium alloy welding wire containing small amount of Ti and 5% of magnesium. As a kind of widely applied universal welding material, it has good corrosion resistance and hot crack resistance, as well as high strength. This welding material is characterized by excellent welding performance, stable arc, beautiful weld joint appearance and low spatter.

Purpose:It is applicable to welding of aluminum-magnesium alloy. It is also adopted for welding of aluminum-zinc-magnesium alloy, repair welding of aluminum-magnesium castings, as well as welding of aluminum-magnesium-manganese alloy and aluminum-magnesiumsilicon alloy. It is the aluminum alloy welding wire with the largest consumption.

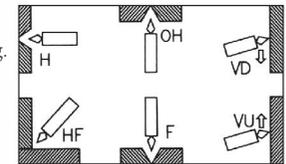
Chemical composition of welding wire (%)

Items	Si	Fe	Cu	Mn	Mg
Guarantee value	≤0.25	≤0.40	≤0.10	0.05-0.20	4.50-5.50
Measured value	0.06	0.13	0.010	0.13	4.88
Items	Cr	Zn	Ti	Be	
Guarantee value	0.05-0.20	≤0.10	0.06-0.20	≤0.0003	
Measured value	0.08	0.008	0.11	0.0001	

Precautions:

1. Impurities such as oxide film and oil stain on the welding edge of the workpiece and the surface of the welding wire shall be thoroughly removed before welding.
2. In the welding process, a subplate can be used to hold the molten metal to ensure formation of the weld joint.

Welding position





JQ·SAI5183

Conform to GB/T 10858 SAI 5183
AWS A5.10 ER5183

Instructions:JQ.SAI5183 is used for welding of base metal which contains high aluminum and magnesium content and requires high tensile strength. It is used for welding of 5083 and 5654 base metal, and performs excellent in seawater corrosion resistance. This welding material is characterized by excellent welding performance, stable arc, beautiful weld joint appearance and low spatter.

Purpose:JQ.SAI5183 is applicable to welding of aluminum-magnesium alloy, as well as welding of ship structures, offshore platforms, cryogenic vessels, railway locomotives and the automotive industry.

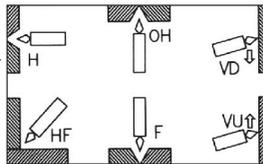
Chemical composition of welding wire (%)

Items	Si	Fe	Cu	Mn	Mg
Guarantee value	≤0.40	≤0.40	≤0.10	0.50-1.00	4.30-5.20
Items	Cr	Zn	Ti	Be	
Guarantee value	0.05-0.25	≤0.25	≤0.15	≤0.0003	

Precautions:

1. Impurities such as oxide film and oil stain on the welding edge of the workpiece and the surface of the welding wire shall be thoroughly removed before welding.
2. In the welding process, a subplate can be used to hold the molten metal to ensure formation of the weld joint.

Welding position



JQ·SAI5087

Conform to GB/T 10858 SAI 5087

Instructions:JQ.SAI5087 is a kind of aluminum-magnesium alloy welding wire containing about 4.5% of Mg and small amount of Mn, Cr and Zr. It is widely applied to welding of aluminum alloy structures that require high strength and good crack resistance, bending resistance and corrosion resistance.

Purpose:JQ.SAI5087 is applicable to welding of aluminum-magnesium alloy, such as military equipment production, storage tanks, shipbuilding, marine engineering and aviation.

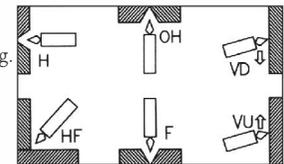
Chemical composition of welding wire (%)

Items	Si	Fe	Cu	Mn	Mg
Guarantee value	≤0.25	≤0.40	≤0.05	0.70-1.10	4.50-5.20
Items	Cr	Zn	Ti	Zr	Be
Guarantee value	0.05-0.20	≤0.25	≤0.15	0.10-0.20	≤0.0003

Precautions:

1. Impurities such as oxide film and oil stain on the welding edge of the workpiece and the surface of the welding wire shall be thoroughly removed before welding.
2. In the welding process, a subplate can be used to hold the molten metal to ensure formation of the weld joint.

Welding position





Quoted standards



Symbol description

- 1、GB/T 5117-2012 Unalloyed and fine grain steel welding rod
- 2、GB/T 5118-2012 Heat resistant steel welding rod
- 3、GB/T 32533-2016 High-strength steel welding rod
- 4、GB/T 983-2012 Stainless steel welding rod
- 5、GB/T 984-2001 Surfacing welding rod
- 6、GB/T 10044-2006 Cast iron welding rod and welding wire
- 7、GB/T 8110-2008 Carbon steel and low alloy steel welding wire for gashielded arc welding
- 8、GB/T 10045-2018 flux cored welding wire for non-alloy and fine grain steels
- 9、GB/T 36233-2018 flux cored welding wire for high-strength steels
- 10、GB/T 17853-2018 Stainless steel flux-cored welding wire
- 11、GB/T 5293-2018 Solid wire electrodes, flux cored welding wire and electrode/flux combinations for submerged arc welding of non-alloy and fine grain steels
- 12、GB/T 12470-2018 Solid wire electrodes, flux cored welding wire and electrode/flux combinations for submerged arc welding of creep-resisting steels
- 13、GB/T 17854-2018 Solid wire electrodes, flux cored welding wire and electrode/flux combinations for submerged arc welding of stainless steels
- 14、GB/T 36034-2018 Solid wire electrodes, flux cored welding wire and electrode/flux combinations for submerged arc welding of high strength steels
- 15、GB/T 36037-2018 Fluxes for submerged arc welding and electroslog welding
- 16、GB/T 29713-2013 Stainless steel welding materials that are resistant to atmospheric corrosion for railway vehicles
- 17、Specification of China Classification Society Materials and Welding 2009 version
- 18、TB/T 2374-2008 Welding material quality regulations
- 19、GB/T 10858-2008 Aluminum and aluminum alloy welding wire

GB	Code of Chinese Standard	ReH	Yield strength (upper yield strength) unit (MPa) or (N/mm ²)
ISO	Code of International Organization for Standardization		
AWS	Standard code of American Welding Society	ReL	Yield strength (lower yield strength) unit (MPa) or (N/mm ²)
JIS	Code of Japanese Industrial Standard		
JB	Code of Mechanical Industrial Standard	A	Elongation (elongation after fracture) (%)
YB	Standard code of the ferrous metallurgical industry	KV2	Impact absorbed energy of V-notch specimen under 2mm pendulum blade
TB	Standard code of the railway transportation industry		
CCS	Code of China Classification Society	P _{cm}	Carbon equivalent
LR	Code of Lloyd's Register of Shipping	MPa	Strength unit (MPa) 1kgf/mm ² =9.8 Mpa
ABS	Code of American Bureau of Shipping		
BV	Code of Bureau Veritas	MPa	Strength unit (N/mm ²) 1MPa=1 N/mm ²
DNV-GL	Code of Det Norske Veritas and Germanischer Lloyd		
NK	Code of Nippon Kaiji Kyokai	J	(Impact) absorbed energy unit (J) 1J=0.102kgf·m
KR	Code of Korean Register of Shipping		
TüV	Code of Technischen Überwachungs-Vereine	HRC	Rockwell hardness scale C
RS	Russian Maritime Register of Shipping	HB	Brinell hardness
Rina	Code of Registro Italiano Navale	HV	Vickers hardness
BKI	Code of PT. Biro Klasifikasi Indonesia (Persero)	CO ₂ welding	Welding method using CO ₂ as shielding gas
CE	Code of European Unity		
DB	Code of Deutsche Bahn AG	Ar+CO ₂	Argon-rich shielding gas
AC	AC power supply	SMAW	Welding rod arc welding
DC ⁺	DCRP, the welding material is connected with the positive pole	MIG	Consumable electrode inert gas-shielded arc welding
DC	DCSP, the welding material is connected with the negative pole	TIG	Tungsten argon arc welding
R _m	Tensile strength unit (MPa) or (N/mm ²)	SAW	Submerged arc welding
R _{P0.2}	Yield strength (stipulated non-proportional extension strength) unit (MPa) or (N/mm ²)	MAG	Active gas-shielded arc welding
		EGW	Electro-gas welding
		ESW	Electroslog welding

I.List of Those Certified by the Classification Society

Golden Bridge model	National standard model	China CCS	Britain LR	France BV	America ABS	Norway/Germany DNV/GL	Japan NK	Korea KR	Russia RS	Italy RINA	Indonesia BKI
		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
J421(J38.12)	E4313	2	2m	2	2	2	KMW2				2
J422(J40.50)	E4303	3	3m	3	3	3	KMW3	3			
J421X(J38.10)									2		
J421Fe(J38.14)									2		
T-50	E4303	3				3	KMW3		3		
J427(J48.47)	E4315	3H10		3H10							
J501Fe18 (J38.62 Fe18)	E5024	2Y	2Ym		2Y	2Y		2Y			
J502	E5003	2Y									
J506(J48.56)	E5016	3YH10	3YmH15		3YH10	3YH10	KMW53 H10	3YH10			
J506Fe(J48.56 Fe)	E5018	3YH10	3YmH15		3YH10	3YH10					3YH10
J506Fe-1(J48.56 Fe-1)	E5018-1	4YH5	4YmH5		4YH5	4YH5					
J507(J48.57)	E5015	3YH10	3YmH15	3YH10	3YH10	3YH10	KMW53 H10	3YH10	3YH10		
J607RH	E6015-G	4Y50H10									
JQ-MG50-6(CO ₂)	ER50-6	3YSH10	3YSH15	3YSH10	3YSAH10	III YMSH10	KSW53 G(C)H10	3YSG (C)H10	3YSMH10		
JQ-MG70S-6	ER50-6	3YS	3YSH15		3YSA						
JQ-MG50-Ti	ER50-G	3YS			3YSA						

Golden Bridge model	National standard model	China CCS	Britain LR	France BV	America ABS	Norway/Germany DNV/GL	Japan NK	Korea KR	Russia RS	Italy RINA	Indonesia BKI
		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
JQ-YJ501-1 (semiautomatic)	E501T-1	3YSH10	3YSH10	3YSH10	3YSAH10	III YM SH10	KSW53 G(C)H10	3YSG (C)H10	3YSMH10 3Y40SMH10	3YSH10	3YSMH10
JQ-CE71T-1	E501T-1	3YSH10	3YSH10	SA3YH10	3YSA H10	III YM S(H10)	KSW53 G(C)H10	3YSG (C)H10			
JQ-YJ501-1L	E501T-1L	4YSH10	4YSH10		4YSA H10	IV YM S(H10)					
JQ-YJ501-1A	E501T-1	3YSH5	3YSH5	SA3YH5	3YSA H5	III YM SH5	KSW53 G(C)H5	3YSG (C)H5	3YSMH5		
JQ-YJ501Ni-1	E491T1- Ni1C	4YSH10	4YSH10	S4YH10	4YSA H10	IV YM S(H10)	KSW54 G(C)H10				
JQ-YJ503MX-1	E500T-1	3YSH10	3YSH10	3YSH10	3YSA H10	III YMS (H10)				3YMSH10	
JQ-YJ601Ni1.5-1	E551T1-K2C					IV YM S(H10)					
JC-30	E551T8-K2	2Y									
JC-29Ni1	E491T8-Ni1J	3YSH10			3YSA H10						
JQ-H08AJ/Q SJ301		3YSH10	3M	3M	3M,2YT	III M, II YT	KAW3M				
JQ-H08MnA/JQ SJ101		3M,2YT	3M,3YT	3YM	3M	III YM	KAW3M				
JQ-H10Mn2JQ SJ101		3YM,3YT	3YM,3YT	3YM,3YT	3YM,3YT	III YTM	KAW53M	3YM	3YMT		
A102	E308-16			308	E308-16	VL308					
A002	E308L-16	304L	304Lm	308L	E308L-16	VL308L					
A302	E309-16			309	E309-16	VL309					
A062	E309L-16	309L	SS/CMnm	309L	E309L- 16	VL309L	KD309L				





Golden Bridge model	National standard model	China CCS		Britain LR		France BV		America ABS		Norway/Germ any, DIN/IGL		Japan NK		Korea KR		Russia RS		Italy RINA		Indonesia BKI	
		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
A022	E316L-16	316L	316Lm	316L	316L	E316L-16	VL316L	VL316L	KD316L												
JQ-308L	E308LT1-1	304LS	304LS	S308L	S308L	E308L-11-1	VL308L	VL308L													
JQ-309L	E309LT1-1	309LS	SS/CMnm	S309L	S309L	E309L-11-1	VL309L	VL309L	KW309LG(C)												
JQ-316L	E316LT1-1	316LS	316LS	316L	316L	E316L-11-1	VL316L	VL316L													
JQ TG50	ER50-6	3Y	3YmH15	3Y	3YSA	3YSA	III YMS	III YMS	KSW53G(I)												
JQ-MG50-6(Ar)	ER50-6	3YS																			
JQ-YJ501-1/JN401	E501T-1		3YSH10																		
JQ-YJ501-1 Automatic welding	E501T-1		3YMH10	AS3YMH10	3YAH10	3YAH10	III YMH10	III YMH10													3YMG(C)H10
JQ-H10Mn2+JQ-SJ101 Double-wire			2YT																		
JQ-H10Mn2+JQ-SJ101 Double-wire 4.0mm, 5.0mm			3YT																		
JQ-H10Mn2+JQ-SJ101 Double-wire 1.6mm, 2.0mm			3YM, 3YT																		
JQ-H10Mn2+JQ-SJ101 Double-wire			3YM, 3YT																		

TUV and DB certified products : JQ-MG50-6, JQ-MG50-6A, JQ-MG50-6A, JQ-MG49-1, JQ-YJ501-1

CE certified products include : JQ-MG50-6, JQ-MG50-6A, JQ-MG49-1, JQ-YJ501-1, J38-10, J506Fe, JQ-MG308LSi, JQ-MG308LSi-G, JQ-MG309LSi-G, JQ-MG309LSi-G, JQ-H00Cr21Ni10, JQ-H1Cr24Ni13, JQ-MG2209, JQ-H08Mn2E/JQ-SJ101Q, JQ-H10Mn2/JQ-SJ101, JQ-MG50-Ti, JQ-YJ501Ni-1, JQ-YJ601Ni1.5-1, JQ-MG309L, JQ-MG308, H10Mn2/JQ-SJ101, JQ-308L, JQ-309L, JQ-316L, JQ-2209, JQ-MG50-6N, JQ-TH550-NQ-II

II. Golden Bridge Welding Materials Package Weight Table

Varieties of welding materials		Inner packaging (Kg)	Outer packaging (Kg)	Remarks
Carbon steel welding rod		5 Kg	20 Kg	
Low alloy steel welding rod		5 Kg	20 Kg	
Heat resistant low temperature steel welding rod		5 Kg	20 Kg	
Stainless steel welding rod		2 Kg	20 Kg	Vacuum packaging
Surfacing welding rod		5 Kg	20 Kg	
Cast iron welding rod	Z208、Z238	2 Kg	20 Kg	
	Z308、Z408、Z508	1 Kg	10 Kg	
Cellulose pipe welding wire		2 Kg	20 Kg	Vacuum packaging
Solid gasshielded welding wire	Carbon steel, low alloy steel	20kg		Φ0.8 15Kg/piece
	Stainless steel	15kg		Φ0.8 12.5Kg/piece
	Barreled	350/250kg		
Flux-cored welding wire	Carbon steel, low alloy steel gas-shielded	15 Kg		Vacuum packaging
		200 Kg /250 Kg		vacuum packaging
	Self-shielded	6 Kg	24Kg	Φ2.0vacuum packaging
Stainless steel	12.5 Kg		Vacuum packaging	
Submerged arc welding wire		25/50/100/200/250 /300/350		
Argon arc welding wire	Carbon steel	5 Kg		
	Stainless steel	5 Kg		
Sintered flux		25 Kg		
Aluminum and aluminum alloy welding wire	Gas-shielded packaging	7Kg/axis		
	Argon arc packaging	5Kg/box		

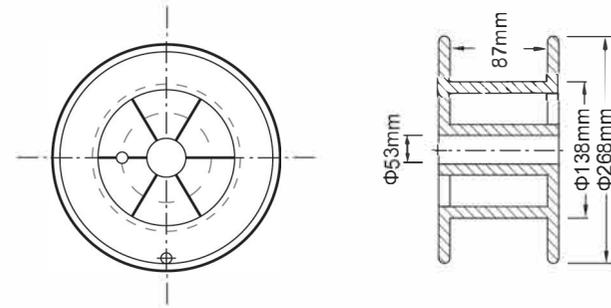


III. "Golden Bridge Welding Materials" Welding Rod Length Table

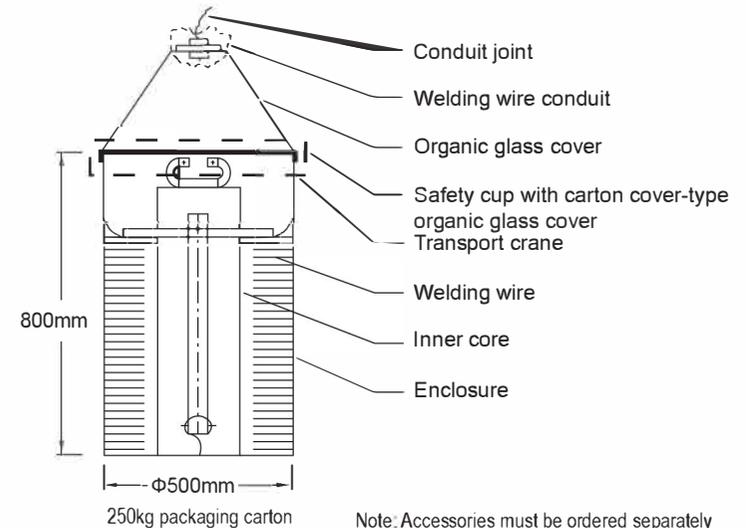
Varieties of welding rod	Welding rod specifications (mm)	Welding rod length (mm)
Carbon steel welding rod, low alloy steel welding rod, heat resistant welding rod, low temperature steel welding rod, surfacing welding rod, Z208, Z238	Φ2.5	300
	Φ3.2	350
	Φ4.0 Φ5.0	400
Stainless steel welding rod D5XX	Φ2.5	300
	Φ3.2 Φ4.0 Φ5.0	350
Z308、Z408、Z508	Φ2.5 Φ3.2	300
	Φ4.0 Φ5.0	350
Cellulose welding rod	Φ3.2 Φ4.0 Φ5.0	350

IV. Gas-shielded solid welding wire and flux-cored welding wire packaging specifications

1. Commonly-used welding wire in spool



2. 2.250Kg welding wire in drum





V. Model preparation instructions of Golden Bridge welding

J	50	7	RH
① One letter	② Two numbers	③ One number	④ Multiple letters

- ① Categories of welding rods
 ② Tensile strength grade or alloy type of the deposited metal
 ③ Types of coatings and categories of the power supply
 ④ Additional alloying elements or purposes of welding rods

Categories of welding rods

First letter	Categories of welding rods
J	Structural steel welding rod
R	Heat resistant steel welding rods
W	Low-temperature steel welding rod
G	Chromium stainless steel welding rods
A	Austenitic stainless steel welding rods
D	Surfacing welding rod
Z	Cast iron welding rod

Types of welding rod coatings and categories of the power supply

Model	Type of coating	Categories of the power supply for welding	Model	Type of coating	Categories of the power supply for welding
J XX0	Not prescribed	Not prescribed	J XX5	Cellulose type	DC or AC
J XX1	Titanium oxide type	DC or AC	J XX6	Low-hydrogen potassium type	DC or AC
J XX2	Titanium-calcium type	DC or AC	J XX7	Low-hydrogen sodium type	DCRP
J XX3	Ilmenite type	DC or AC	Z XX8	Graphite type	DC or AC
J XX4	Iron oxide type	DC or AC	J XX9	Salt base type	DC or AC



Interpretation of the welding rod model

First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
J	J42X	≥420	The third number represents the type of the coating and the category of the power supply
	J50X	≥490	
	J55X	≥540	
	J60X	≥590	
	J70X	≥690	
	J75X	≥740	
	J80X	≥780	
	J10X	≥980	
First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
R	R1XX	Mo~0.5	The second number represents different models of main chemical composition grade of the same deposited metal and the third number represents the type of the coating and the category of the power supply
	R2XX	Cr~0.5 Mo~0.5	
	R3XX	Cr1~2 Mo0.5~1	
	R4XX	Cr~2.5 Mo~1	
	R5XX	Cr~5 Mo~0.5	
	R6XX	Cr~9 Mo~1	
	R7XX	Cr~11 Mo~1	
First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
W	W60X	-60	The third number represents the type of the coating and the category of the power supply
	W70X	-70	
	W80X	-80	
	W90X	-90	
	W10X	-100	



VI. Common model preparation method of Golden Bridge gas-shielded solid welding wires

Carbon steel, low-alloy steel solid gas-shielded welding wires

First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
A	A0XX	C≤0.04	The second number represents different models of main chemical composition grade of the same deposited metal and the third number represents the type of the coating and the category of the power supply
	A1XX	Cr~19, Ni~10	
	A2XX	Cr~18, Ni~12	
	A3XX	Cr~23, Ni~13	
	A4XX	Cr~25, Ni~20	
	A5XX	Cr~16, Ni~25	
	A6XX	Cr~16, Ni~35	
	A7XX	Chromium manganese nitrogen stainless steel	
First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
D	D10X-24X	Welding rods with different hardness for surfacing under normal temperature	The third number represents the type of the coating and the category of the power supply
	D25X-29X	Welding rods for surfacing of high manganese steel under normal temperature	
	D30X-49X	Welding rods for surfacing of dies and tools	
	D50X-59X	Welding rods for valve surfacing	
	D60X-69X	Welding rods for surfacing of alloy cast iron	
	D70X-79X	Welding rods for surfacing of tungsten carbide	
	D80X-89X	Welding rods for surfacing of cobaltbase alloy	
First letter	Model	Tensile strength grade of the deposited metal (MPa)	Remarks
Z	Z2XX	Cast iron	The second number represents different models of main chemical composition grade of the same deposited metal and the third number represents the type of the coating and the category of the power supply
	Z3XX	Pure nickel	
	Z4XX	Nickel-iron alloy	
	Z5XX	Nickel-copper alloy	

J Q • MG 50 - 6

① Two letters	② Two letters	③ Two numbers	④ Number and letter
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Code of Golden Bridge product Represent MAG welding wire Minimum tensile strength of the deposited metal Chemical composition classification code of the welding wire

Interpretation

Model	Tensile strength grade (MPa)
JQ•MG 50-X	≥500
JQ•MG 60-X	≥620
JQ•MG 70-X	≥690
JQ•MG 80-X	≥790
JQ•MG 90-X	≥890
- X	When X stands for a letter, it refers to a sub-category in a category, and represents the chemical composition classification code of the welding wire.
- G	Refer to composition and performance

Aluminum and aluminum alloy solid gas-shielded welding wires

J Q • SAI/HS 4043 (AlSi5)

① Two letters	② Two letters	③ Four numbers	④ Letter + number
---------------	---------------	----------------	-------------------

Code of Golden Bridge product SAI represents MIG welding wires and HS represents TIG welding wires. Welding wire model Chemical composition classification code of the welding wire

Interpretation

Aluminum and aluminum alloy MIG welding wires	Aluminum and aluminum alloy TIG welding wires	GB/T10858-2008	AWS A5. 10/5. 10M
JQ•SAI4043	JQ•HS4043	AlSi5	ER4043, R4043
JQ•SAI4047	JQ•HS4047	AlSi12	ER4047, R4047
JQ•SAI5356	JQ•HS5356	AlMg5Cr	ER5356, R5356
JQ•SAI5183	JQ•HS5183	AlMg4.5Mn0.7	ER5183, R5183
JQ•SAI5087	JQ•HS5087	AlMg4.5MnZr	ER5087, R5087



VII. Model preparation method of Golden Bridge flux-cored welding wires

(I) Structural steel, heat resistant steel, flux-cored welding wires for surfacing

J Q • YJ 50 1 Ni - 1

① Two letters	② Two letters	③ Two numbers	③ One numbers	⑤ Multiple letters	⑥ Number and letter
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- ① Code of Golden Bridge product
- ② Represent categories of flux-cored welding wires
- ③ Tensile strength grade or alloy type of the deposited metal
- ④ Types of flux core
- ⑤ Additional alloying element
- ⑥ Characteristics of each category of welding wires

Categories of flux-cored welding wires

Letter	Name of the welding wire
YJ	Flux-cored welding wires for structural steel
YD	Flux-cored welding wires for surfacing
YR	Flux-cored welding wires for heat resistant steel

Types of flux core

Model	Types of flux core
YJ XX1	Titanium oxide type
YJ XX2	Titanium-calcium type
YJ XX7	Calcium oxide-fluoride type



Interpretation of models of commonly-used flux-cored welding wires

Categories of welding wires	Model	Tensile strength grade (MPa)	Remarks
YJ	YJ50X-X	≥480	The third number represents the type of the flux core
	YJ55X-X	≥550	
	YJ60X-X	≥590	
Categories of welding wires	Model	Main chemical composition grade of the deposited metal (%)	Remarks
YR	R1XX-X	Mo~0.5	The third number represents the type of the flux core
	R2XX-X	Cr~0.5 Mo~0.5	
	R3XX-X	Cr1~2 Mo0.5~1	
	R4XX-X	Cr~2.5 Mo~1	
Categories of welding wires	Model	Main purpose or main chemical composition	Remarks
YR	YD1XX-X	Welding rods with different hardness for surfacing under normal temperature	The third number represents the type of the flux core

(II) Stainless steel flux-cored welding wires

J Q - 308L

① Two letters	② Number and letter
------------------	------------------------

- ① Code of Golden Bridge product
- ② Internationally universal chemical composition classification code of the deposited metal



VIII. Common model preparation method of Golden Bridge submerged arc welding wires - flux

(I) Submerged arc welding wires (carbon steel, low alloy steel and stainless steel)

J Q	•	H	08	Mn2Mo	A
① Two letters	② One letter	③ Two numbers	④ Multiple letters and numbers	⑤ One letter	

- ① Code of Golden Bridge product
- ② Represent submerged arc welding wires
- ③ Carbon content of welding wires
- ④ Percentage value of the approximate content of the element
- ⑤ A – high-quality steel containing low S and P content
E – welding wires require extremely low S and P content

(II) Submerged arc flux

J Q	•	SJ	1	01	Ni
① Two letters	② Two letters	③ One numbers	④ Two numbers	⑤ Multiple letters	

- ① Code of Golden Bridge product
- ② Sintered flux for submerged arc welding
- ③ Flux and slag series
- ④ Model No. of flux of the same slag series type
- ⑤ Additional alloying elements or special properties and purposes

Meaning of the first number in the model of the sintered flux

Flux model	Slag series type
SJ1XX	Fluorine-alkali type
SJ2XX	High aluminum type
SJ3XX	Silicon-calcium type
SJ4XX	Silicon-manganese type
SJ5XX	Aluminum-titanium type
SJ6XX	Other types

IX. Storage of welding materials

(I) Welding rods

1. Precautions

- (1) Welding rods shall be kept in a ventilated and dry warehouse, where the relative humidity of the air shall be controlled below 60%. In addition, the stacked welding rods shall be kept 30cm away from the ground and wall.
- (2) Welding rods shall be stored based on their models and specifications, avoiding mixing.
- (3) Be careful not to damage the coating during carrying and stacking and pay more attention to welding rods covered with coatings with poor strength: such as stainless steel welding rods, surfacing welding rods, and cast iron welding rods, to which special attention shall be paid. Avoid too high welding rod stacking.

2. Influence of welding rods affected with damp

After welding rods are affected with damp, the color of the coating usually turns dark and the colliding welding rods lose the silvery metallic sound. Sometimes salts separate out to make the welding rod display "white flowers". Influence of welding rods affected with damp on the welding process:

- (1) Arc is unstable, spatter increases and particles are too large.
- (2) Depth of fusion is large and undercut is easy to occur.
- (3) Slag coverage is poor and weld ripples are rough.
- (4) Slag removal is difficult.

Influence of welding rods affected with damp on the welding quality:

- (1) It is easy to cause weld cracks and pores, especially for alkaline welding rods.
- (2) Values corresponding to mechanical properties are usually low.

3. Drying of welding rods

- (1) The welding rods are affected with damp after storage for a long time, but the core wire does not rust and the coating does not go bad, and they can maintain their original performance after drying, not affecting use.



Drying conditions for welding rods covered with various types of coating are as below (reference value):

Acid welding rods	Baking temperature of 150 - 200 °C and heat preservation for 1h
Alkaline welding rods	Baking temperature of 350 - 400 °C and heat preservation for 1h
Cellulose welding rod	Baking temperature of 80 °C and heat preservation for 1.5 - 2h
Graphite welding rods	Baking temperature of 200 °C and heat preservation for 1h

(2) Avoid too high and too low baking temperature. If temperature is too low, moisture cannot be removed; Too high temperature will make the coating prone to cracking, crisping or shedding, or results in changes in the composition of the coating, further affecting the welding quality.

(3) Alkaline welding rods after drying shall not be exposed outdoor for more than 4h.

(4) The coating of the welding rod frequently subject to repeated drying is easy to shed.

4. Scrapping of welding rods

When the core wire gets rusty and the coatings stick together, peel off, and are severely affected with damp (especially low-hydrogen welding rods, heat resistant steel welding rods and low-temperature steel welding rods), such welding rods shall not be used again and shall be scrapped.

(II) Welding wires

1. Precautions

(1) Welding wires shall be kept in a ventilated and dry warehouse exclusive for storage of welding materials, where the relative humidity of the air shall be controlled below 60%. In addition, the stacked welding wires shall be kept 30cm away from the ground and wall.

(2) Welding rods shall be stored based on their models and specifications, avoiding mixing.

(3) Avoid throwing and leaving about and protect the package from damage in the handling process. Once the package is damaged, it may cause welding wires to absorb moisture and get rusty.

(4) For barreled welding wires, absolutely forbid rolling barrels during handling and unspooling or tilting the barrels, so as to avoid intertwining of welding wires inside for smooth use.

(5) Avoid too high welding wire stacking.

(6) Under normal circumstances, drying is not necessary for flux-cored welding wires, which shall be used up as soon as possible after unpacking. When welding wires that are not used up are to be placed in the wire feeder overnight, it is required to cover the wire feeder (wire reel) with canvas, plastic cloth or other items to reduce the contact with moisture in the air.

(7) CO₂ used for protection of flux-cored welding wires shall be pure anhydrous gas.

2. Influence of welding wires affected with damp

Welding wires affected with damp can increase the diffusible hydrogen content in the deposited metal, causing such defects as pits and pores, and the welding performance and the mechanical properties of the weld metal will become worse. The weld joint may crack in a severe case.

(III) Flux for submerged arc welding

1. The flux is generally in bags, which shall be transported properly to prevent damage to the package;

2. The flux shall be stored in a dry room with indoor temperature of 5-5 °C to prevent damp from affecting the welding quality, and it is not allowed to be placed in a high temperature, high humidity environment.

3. Before use, the flux shall be baked according to the parameters specified in the instructions. When baked, the flux is scattered in the disk and the thickness is 50mm at most.



X.Hardness Number Comparison Table

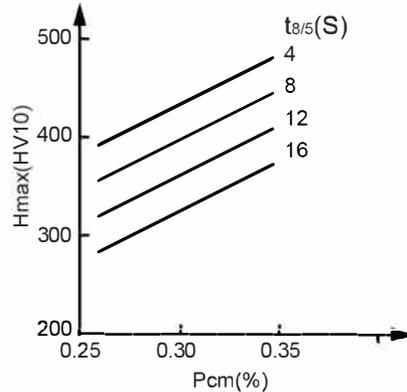
Vickers hardness HV	Brinell hardness HV	Rockwell hardness		Shore hardness HS	Strength limit (approximate value) MPa
		B HRB	C HRC		
940	—	—	68.0	97	—
920	—	—	67.5	96	—
900	—	—	67.0	95	—
880	—	—	66.4	93	—
860	—	—	65.9	92	—
840	—	—	65.3	91	—
820	—	—	64.7	90	—
800	—	—	64.0	88	—
780	—	—	63.3	87	—
760	—	—	62.5	86	—
740	—	—	61.8	84	—
720	—	—	61.0	83	—
700	—	—	60.1	81	—
690	—	—	59.7	—	—
680	—	—	59.2	80	2273
670	—	—	58.8	—	2234
660	—	—	58.3	79	2195
650	—	—	57.8	—	2166
640	—	—	57.3	77	2126
630	—	—	56.8	—	2097
620	—	—	56.3	75	2058
610	—	—	55.7	—	2028
600	—	—	55.2	74	1989
590	—	—	54.7	—	1960
580	—	—	54.1	72	1920
570	—	—	53.6	—	1891
560	—	—	53.0	71	1852
550	505	—	52.3	—	1823
540	496	—	51.7	69	1793
530	488	—	51.1	—	1754
520	480	—	50.5	67	1725
510	473	—	49.8	—	1685
500	465	—	49.1	66	1656
490	456	—	48.4	—	1617
480	448	—	47.7	64	1587
470	441	—	46.9	—	1548
460	433	—	46.1	62	1529
450	425	—	45.3	—	1480
440	415	—	44.5	59	1458
430	405	—	43.6	—	1411



Vickers hardness HV	Brinell hardness HV	Rockwell hardness		Shore hardness HS	Strength limit (approximate value) MPa
		B HRB	C HRC		
420	397	—	42.7	57	1382
410	388	—	41.8	—	1342
400	379	—	40.8	55	1313
390	369	—	39.8	—	1274
380	360	(110.0)	38.8	52	1244
370	350	—	37.7	—	1205
360	341	(109.0)	36.6	50	1176
350	331	—	35.5	—	1146
340	322	(108.0)	34.4	47	1107
330	313	—	33.3	—	1078
320	303	(107.0)	32.2	45	1039
310	294	—	31.0	—	1009
300	284	(105.5)	29.8	42	970
295	280	—	29.2	—	960
290	275	(104.4)	28.5	41	941
285	270	—	27.8	—	921
280	265	(103.5)	27.1	40	902
275	261	—	26.4	—	892
270	256	(102.0)	25.6	38	872
265	252	—	24.8	—	853
260	247	(101.0)	24.0	37	833
255	243	—	23.1	—	823
250	238	99.5	22.2	36	804
245	233	—	21.3	—	784
240	228	98.1	20.3	34	764
230	219	96.7	(18.0)	33	735
220	209	95.0	(15.7)	32	696
210	200	93.4	(13.4)	30	666
200	190	91.5	(11.0)	29	637
190	181	89.5	(8.5)	28	608
180	171	87.1	(6.0)	26	578
170	162	85.0	(3.0)	25	549
160	152	81.7	(0.0)	24	519
150	143	78.7	—	22	490
140	133	75.0	—	21	451
130	124	71.2	—	20	431
120	114	66.7	—	—	392
110	105	62.3	—	—	—
105	95	56.2	—	—	—
95	90	52.0	—	—	—
90	86	48.0	—	—	—
85	81	41.0	—	—	—



The maximum hardness H_{max} of the welding heat affected zone (HAZ) can be obtained by means of graph and formula



Relationship between H_{max} and $t_{8/5}$ and P_{cm}
 $H_{max} = 140 + 1089P_{cm} - 8.2t_{8/5}$

$$P_{cm} = C + \frac{Si}{30} + \frac{Mn+Cr+Cu}{20} + \frac{Ni}{20} + \frac{Mo}{20} + \frac{V}{20} + 5B \quad (\%)$$

$t_{8/5} = 800^{\circ}C - 500^{\circ}C$ cooling time

Steel: 18MnMoNb, 14MnMoNbB, 10WMoVNB, 16Mn, 15MnV, 12CrNi3MoV
 Plate thickness: 16~36mm

XI. Common Units and Conversion Table

Pressure value conversion table					
	N/m ²	Dynes/cm ²	Atm	Psi	mmHg
N/m ²	1	0.1	1.013×10 ⁵	6.895×10 ³	1.333×10 ²
Dynes/cm ²	10	1	1.013×10 ⁶	6.895×10 ⁴	1.333×10 ³
Atm		9.869×10 ⁻⁷	1	6.804×10 ⁻²	1.316×10 ⁻²
Psi	1.450×10 ⁻⁴	1.450×10 ⁻⁵	14.70	1	1.934×10 ⁻²
mmHg(0°C)	7.501×10 ⁻³	7.501×10 ⁻⁴	7.6010 ²	51.71	1
Energy conversion table					
J	kW.h		Kgf.m		kcal
1	2.77778×10 ⁻⁷		1.01972×10 ⁻¹		2.38889×10 ⁻⁴
3.600×10 ⁶	1		3.67098×10 ⁵		8.6000×10 ²
9.80665	2.72407×10 ⁻⁶		1		2.34270×10 ⁻³
4.18605×10 ³	1.16279×10 ⁻³		4.26858×10 ²		1
Impact value unit conversion			Conversion of unit of work		
(N·m/m ²)	(kgf·m/cm ²)	(ft·lbf/in ²)	(N·m)	(kgf·m)	(ft·lbf)
1	0.102×10 ⁻⁴	4.75×10 ⁻³	1	0.102	0.7376
98067	1	46.65	9.807	1	7.233
2102.9	0.021	1	1.356	0.1383	1
Temperature unit conversion					
°F = ($\frac{9}{5} \times ^{\circ}C$ + 32)			°C = (°F - 32) / 9		



XII.Length Unit Conversion Table(mm and inch)

in	mm	in	mm
1/64	0.3969	33/64	13.0969
1/32	0.7938	17/32	13.4938
3/64	1.1906	35/64	13.8906
1/16	1.5875	9/16	14.2875
5/64	1.9844	37/64	14.6844
3/32	2.3812	19/32	15.0812
7/64	2.7781	39/64	15.4781
1/8	3.175	5/8	15.875
9/64	3.5719	41/64	16.2719
5/32	3.9688	21/32	16.6688
11/64	4.3656	43/64	17.0656
3/16	4.7625	11/16	17.4625
13/64	5.1596	45/64	17.8594
7/32	5.5562	23/32	18.2562
15/64	5.9531	47/64	18.6531
1/4	6.35	3/4	19.05
17/64	6.7469	49/64	19.4469
9/32	7.1438	25/32	19.8438
19/64	7.5406	51/64	20.2406
5/16	7.9375	13/16	20.6375
21/64	8.3344	53/64	21.0344
11/32	8.7312	27/32	21.4313
23/64	9.1281	55/64	21.8281
3/8	9.525	7/8	22.225
25/64	9.9219	57/64	22.6219
13/32	10.3188	29/32	23.0188
27/64	10.7156	59/64	23.4156
7/16	11.1125	15/16	23.8125
29/64	11.5094	61/64	24.2094
15/32	11.9062	31/32	24.6062
31/64	12.3031	61/64	25.0031
1/2	12.7	1	25.4

in	1	2	3	4	5	6	7	8	9
mm	25.4	50.8	76.2	101.6	127.0	152.4	177.8	203.2	228.6



XIII.International standard on the diffusible hydrogen content of welding materials (deposited metal)

(ISO 3690) ml/100g

	IIW (mercury method)	HGB (glycerol method)
High hydrogen	> 15	> 9
Medium hydrogen	≤ 15 > 10	≤ 9 > 5.5
Low hydrogen	≤ 10 > 5	≤ 5.5 > 2
Ultra-low hydrogen	≤ 5	≤ 2

XIV.Preheating temperature required is determined based on carbon equivalent P_{cm} of steel, diffusible hydrogen content [H] of the specific welding material and plate thickness δ

公式1: $T(^{\circ}\text{C}) = 1400P_c - 392$ (established according to low alloy steel of Japan)

$$P_c = P_{cm} + \frac{[H]}{60} + \frac{\delta}{600}$$

$$P_{cm} = C + \frac{Si}{30} + \frac{Mn+Cr+Cu}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B (\%)$$

[H] Diffusible hydrogen content in the deposited metal
(glycerol method ml/100g)

δ --Plate thickness (mm)

Formula 2: $T(^{\circ}\text{C}) = 324 P_{cm} + 17.7 [H] + 0.14 R_m + 4.73 \delta - 214$
(established according to 16Mn, 15MnV, 15MnVN, 18MnMoNb, 14MnMoNbB
and other low alloy steels of China)

R_m — Tensile strength of the welded steel (MPa)



XV. Common welding defects

There are various weld joint defects, and the common defects inside and outside the weld joint can be summarized as follows:

I. Weld joint size is not in line with the requirements

Rough weld ripples, uneven appearance, too low or too high weld joint strengthening height, inconsistent width of weld ripples, single-side fillet weld and too large amount of sag all belong to defects that the weld joint size is not in line with the requirements, for which, the reasons may be:

1. Improper angle of the weldment groove or uneven assembly clearance.
2. Too large or too small welding current and inappropriate welding specification selected.
3. Non-uniform welding rod manipulation speed and improper welding rod (weld handle) angle.

II. Cracks

The shape of the crack end is sharp and the stress concentration is serious, which imposes large influence on bearing alternating and impact loads and static tensile force. It is the most dangerous defect of the weld joint. There are three types of cracks, namely, cold crack, hot crack and reheat crack based on causes.

(Cold cracks) refer to cracks generated below 200 °C, which is closely related to hydrogen and for which, the main reasons may be:

1. Preheating temperature selected for large and thick workpieces and slow cooling measures taken after welding are not appropriate.
2. The welding material selected is not suitable.
3. The welded joint has large rigidity and the process is not reasonable.
4. Brittle and hard structure is generated at and next to the weld joint.
5. The welding specification selected is improper.

(Hot cracks) refer to cracks (dominated by solidification cracks) generated above 300 °C, for which, the main reasons may be:

1. Influence of composition. It is easy to occur in the process of welding pure austenitic steel, some high-nickel alloy steel and non-ferrous metal.
2. The weld joint contains many harmful impurity elements such as sulfur.
3. Welding conditions and joint forms are not properly selected. (Reheat cracks) refer to stress relief annealing cracks. Refer to the intergranular cracks generated in the heat affected zone due to postweld



(Reheat cracks) refer to stress relief annealing cracks. Refer to the intergranular cracks generated in the heat affected zone due to postweld heat treatment or use under high temperature in the high strength weld zone, for which, the main reasons may be:

1. The heat treatment conditions for stress-relief annealing are improper.
2. Influence of alloy composition. Elements such as chromium, molybdenum, vanadium and boron may be able to increase reheat cracks.
3. The welding material and welding specification selected are improper.
4. Unreasonable structure design results in large stress concentration.

III. Pore

In the welding process, cavity generates inside or on the surface of the weld metal because the gas fails to timely escape, for which, the reasons may be:

1. Welding rods and flux are not dry enough.
2. The welding process is not stable enough, the arc voltage is too high, the arc is too long, the welding speed is too fast or the welding current is too small.
3. Oil, rust and other impurities on the surface of the filler metal and the base metal are not thoroughly cleared.
4. The backward method is not adopted for melting the arc strike point.
5. The preheating temperature is too low.
6. The positions respectively for arc strike and arc extinguishing are not staggered.
7. The weld zone is poorly protected and the molten bath area is too large.
8. The AC power supply is prone to generating pores, while the possibility of generating pores by DCRP is the minimum.

IV. Overlap

In the welding process, the molten metal flows to the un-melted base metal outside the weld joint and form the metal tumor, which changes the cross-sectional area of the weld joint and is unfavorable to the dynamic load. The reasons may be:

1. The arc is too long and the current for backing welding is too large.
2. The current is too large during vertical welding and the welding rod swing is not appropriate.
3. The weld joint assembly clearance is too large.

V. Arc crater

The weld joint has obvious misrun and concave at the end of welding. The reasons may be:

1. Arc extinguishing is improperly operated, and the arc extinguishing time is too short.
2. When the automatic welding is performed, wire feeding and the power supply are cut off at the same time, rather than stopping wire feeding before disconnecting the power supply.

**VI.Undercut**

After the arc melts the base metal at the edge of the weld joint, it is not supplemented by the weld metal, thus leaving a gap. The undercut reduces the force-bearing cross section of the joint, which weakens strength of the joint and results in stress concentration, making damage possible to the undercut position.

The reasons may be:

- 1.The current is too large, the arc is too long, the speed of welding rod manipulation is improper, and the arc heat is too much.
- 2.The voltage for submerged arc welding is too low and the welding speed is too high.
- 3.The angle of inclination of welding rods and wires is incorrect.

VII. Slag inclusion

Non-metallic inclusions are present inside the weld metal or on the fusion line. The slag inclusion will affect mechanical properties, and the degree of influence is related to the number and shape of the inclusions. The reasons may be:

- 1.Each layer of welding slag is not thoroughly removed during multilayer welding.
- 2.There is thick rust on the weldment.
- 3.The physical properties of coating of the welding rod are inappropriate.
- 4.The shape of the weld layer is poor and the groove angle is not properly designed.
- 5.The ratio of the width of fusion to the depth of fusion of the weld joint is too small, and the undercut is too deep.
- 6.The current is too small and the welding speed is too fast, so the slag is unable to float out in time.

VIII.Lack of penetration

There is regional incomplete fusion between base metals or between the base metal and the deposited metal. It generally exists at the weld joint root of single-sided welding, which is sensitive to stress concentration and imposes great influence on strength fatigue and other properties. The reasons may be:

- 1.The groove design is poor, the angle is small, the truncated edge is large, and the gap is small.
- 2.The angle of welding rods and wires is incorrect.
- 3.The current is too small, the voltage is too low, the welding speed is too fast, the arc is too long, and there is magnetic blow.
- 4.Thick rust on the weldment is not removed.
- 5.Welding deviation during submerged arc welding.

**XVI.Common straight carbon steel standard and comparison between new and old low-alloy structural steel standards****Chemical composition and mechanical properties of ordinary carbon steel**

Steel grade	Grade	Chemical composition (%)					Chemical composition (%)				
		C	Mn	Si	S	P	Rm (MPa)	ReH (MPa)	δ5 (%)	KV2 (J)	
Q195	—	≤ 0.12	≤ 0.50	≤ 0.30	≤ 0.040	≤ 0.035	315 ~ 430	≥ 195	≥ 33	—	—
Q215	A	≤ 0.15	≤ 1.20	≤ 0.35	≤ 0.050 ≤ 0.045	≤ 0.045	335 ~ 450	≥ 215	≥ 31	—	—
	B	≤ 0.15	≤ 1.20	≤ 0.35	≤ 0.050 ≤ 0.045	≤ 0.045	335 ~ 450	≥ 215	≥ 31	20°C	≥ 27
Q235	A	≤ 0.22	≤ 1.40	≤ 0.35	≤ 0.050	≤ 0.045	370 ~ 500	≥ 235	≥ 26	—	—
	B	≤ 0.20			≤ 0.045	20°C				≥ 27	
	C	≤ 0.17			≤ 0.040 ≤ 0.035	0°C					
	D	≤ 0.17			≤ 0.035 ≤ 0.035	-20°C					
Q275	A	≤ 0.24	≤ 1.50	≤ 0.35	≤ 0.050	≤ 0.045	410 ~ 540	≥ 275	≥ 22	—	—
	B	≤ 0.21			≤ 0.045 ≤ 0.040	20°C					
	C	≤ 0.20			≤ 0.040 ≤ 0.035	0°C					
	D	≤ 0.20			≤ 0.035 ≤ 0.035	-20°C					

Comparison between new and old standards for low-alloy structural steel

GB/T 1591-2008	GB 1591-88
Q295	09MnV、09MnNb、09Mn2、12Mn
Q345	12MnV、14MnNb、16Mn、16MnRe
Q390	15MnV、15MnTi、16MnNb、14MnMoNb
Q420	15MnVN、14MnVTiRe、14MnMoVN
Q460	18MnMoNb、15MnMoV、14MnMoVB
*Q650	14MnMoNbB

*—Standard of the Ministry of Metallurgy



XVII. Welding rods recommended for commonly-used carbon steel and low-alloy steel

Base metal model	National standard models of welding rods	Model of welding rod
Q235-A.F、Q235-A、Q235-B、10、20、HRB235	E4303	J422
20R、20g、20G	E4316	J426
	E4315	J427
HRB335 (20MnSi)	E5003	J502
09MnNiD、09MnNiDR		W707
Q345、16Mn、16MnR、16Mn 锻	E5016	J506
	E5015	J507
16MnD、16MnDR 15MnNiDR	E5016-G	J506RH
	E5015-G	J507RH
Q390、15MnVR、20MnMoD	E5016	J506
	E5015	J507
	E5515-G	J557
20MnMoNb、18MnMoNbR	E6016-D1	J606
	E6015-D1	J607
12CrMo	E5515-B1	R207
15CrMo、15CrMoR	E5515-B2	R307
12Cr1MoV	E5515-B2-V	R317
12Cr2Mo、12Cr2Mo1R	E6015-B3	R407
1Cr5Mo	E5MoV-15	R507

Welding rods recommended for different carbon steel and low-alloy steel phase welding

Category	Joint steel grade	National standard models of welding rods	Model of welding rod
Carbon steel, low alloy steel and low alloy steel phase welding	Q235-A + Q345(16Mn)	E4316	J426
	20、20R + 16MnR	E4315	J427
	Q235-A + 18MnMoNbR	E5015	J507
	16MnR + 15MnMoV	E5015	J507
	16MnR + 18MnMoNbR		
	15MnVR + 20MnMo	E5015	J507
20MnMo + 18MnMoNbR	E5515-G	J557	
Carbon steel, carbonmanganese low alloy steel and chromiummolybdenum low alloy steel phase welding	Q235-A + 15CrMo	E4315	J427
	Q235-A + 1Cr5Mo		
	16MnR+15CrMo、12Cr1MoV	E5015	J507
	15MnMoV+12CrMo、15CrMo	E7015-D2	J707
15MnMoV+12Cr1MoV			

XVIII. Consumption of filler materials

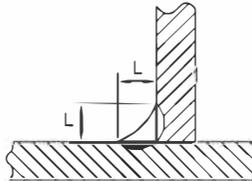
1. Calculation of the consumption of filler materials

The amount of welding materials required can be calculated according to the following requirements:

$$W = \frac{D}{1-L}$$

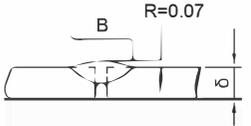
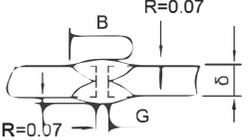
Wherein, W – weight of welding rods required (kg);
D – Weight of the deposited metal (kg);
L – Loss rate of welding materials (%).

2. Fillet weld

	Size of fillet weld L	Weight of deposited metal for unit size of weld joint (g/mm)	Weight of welding materials required by unit size of weld joint (g/mm)		
			Welding rod	Fluxcored welding wire	Solid welding wire
 Horizontal fillet weld	3	0.04	0.07	0.05	0.04
	5	0.09	0.17	0.12	0.10
	6	0.16	0.29	0.20	0.18
	8	0.25	0.45	0.31	0.27
	10	0.36	0.65	0.44	0.39
	13	0.63	1.15	0.79	0.70
	16	0.99	1.79	1.23	1.10
	19	1.42	2.58	1.73	1.58
	25	2.53	4.60	3.16	2.81
	*Including welding slag and spatter loss				

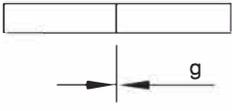
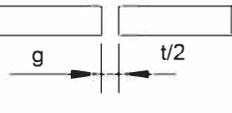
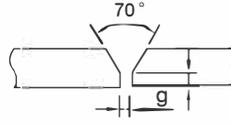
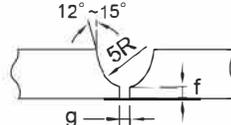
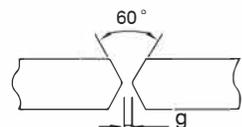
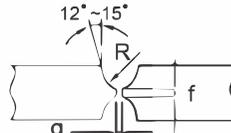


3. Butt weld

Groove butt weld of single-sided welding	Size of weld joint (mm)			Weight of deposited metal for unit size of weld joint (g/mm)		Weight of welding rods required by unit size of weld joint (g/mm)	
	Plate thickness δ	Width of the weld bead B	Root gap G	Not strengthened	Strengthened	Not strengthened	Strengthened
 <p>For double-sided welding, if the weld leg at the top of welding is planned or gouged and then welding is performed, 31.8g of deposited metal (equivalent to about 59g welding rods) will be increased.</p> 	5	10	1.59	—	0.13 0.16	—	0.24 0.30
	6	11	1.59 2.38	0.04 0.06	0.19 0.21	0.07 0.10	0.34 0.39
	8	13	1.69 2.38	0.05 0.07	0.23 0.25	0.09 0.13	0.40 0.45
	3	6	0 0.79	— 0.02	0.18 0.20	— 0.04	0.31 0.36
	5	10	0.79 1.59	0.03 0.06	0.30 0.32	0.06 0.10	0.54 0.58
	6	11	1.59 2.38	0.08 0.12	0.39 0.43	0.15 0.21	0.70 0.79
V-shaped groove butt weld	6	5.26	1.59	0.13	0.21	0.22	0.37
	8	7.9	2.38	0.26	0.38	0.46	0.68
	10	10.52	3.18	0.42	0.59	0.74	1.04
	13	14.17	3.18	0.73	0.95	1.30	1.71
	16	17.83	3.18	1.12	1.40	2.01	2.5
	19	21.51	3.18	1.62	1.97	2.89	3.5
	25	28.91	3.18	2.87	3.34	5.14	5.96
R= Strengthening height	*Including welding slag and spatter loss						

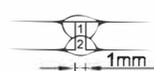
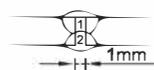
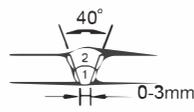


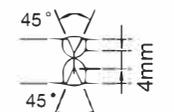
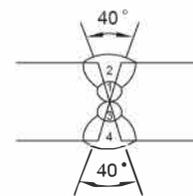
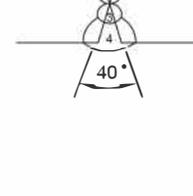
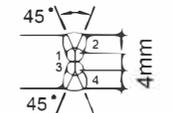
XIX. Recommended groove shapes of welding rod arc welding based on plate thickness

Groove shapes	Plate thickness(mm)	Shape and size (mm)
I shape	1. 2	 <p>$g=0$</p>
I shape	1. 2~5. 0	 <p>$g=t/2$ $t=板厚$</p>
V shape	5. 0~12. 0	 <p>$f=1.6$ $g=0.8\sim1.6$</p>
U shape	12. 0~20. 0	 <p>$f=3.2$ $g=1.6\sim3.2$</p>
X shape	20. 0~25. 0	 <p>$f=0$ $g=0\sim1.6$</p>
H shape	25. 0~30. 0	 <p>$f=3.2$ $g=1.6\sim3.2$</p>



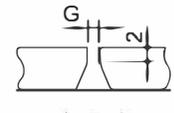
XX. Groove shapes and welding parameters of solid gasshielded welding

Groove shapes		Plate thickness mm	Diameter mm	Num. of layers	Current A	Voltage V	Speed cm/min	CO2 Flow /min
I shape		6	1.6	1	400~430	36~38	80	15~20
		8	1.6	2	350~380 400~430	35~37 36~38	70	20~25
		12	1.6	2	400~430 400~430	36~38 36~38	70	20~25
V shape		8	1.2	2	120~130 250~260	26~27 28~30	30~50	20
		10	1.2	2	130~140 280~300	26~27 30~33	30~50 25~30	20
		16	1.2	3	120~140 300~340 300~340	25~27 33~35 35~37	40~50 30~40 20~30	20
		19	1.2	4	120~140 300~340 300~340 300~340	25~27 33~35 33~35 35~37	40~50 30~40 30~40 20~25	20

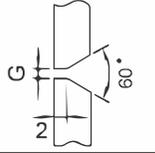
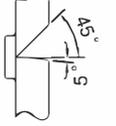
Groove shapes		Plate thickness mm	Diameter mm	Number of layers	Current A	Voltage V	Speed cm/min	CO2 Flow /min
		10	1.2	2	300~320	37~39	60~70	20
					300~320	37~39	60~70	
		16	1.2	4	140~160	24~26	20~30	20
					260~280	31~33	35~40	
					270~290	34~36	50~60	
					270~290	34~36	40~50	
					140~160	24~26	26~30	
		19	1.2	4	140~160	24~26	26~30	20
					260~280	31~33	35~45	
					300~320	35~37	40~50	
					300~320	35~37	35~40	
		16	1.6	4	400~430	36~38	50~60	25
					400~430	36~38	50~60	
		19	1.6	4	400~430	36~38	35~45	25
					400~430	36~38	35~45	



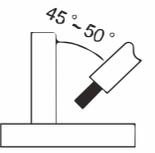
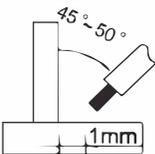
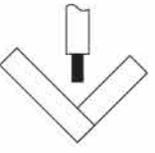
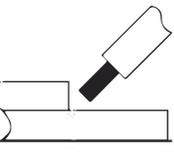
Vertical welding butt

Groove shapes	Plate thickness mm	Root gap G mm	Diameter mm	Current A	Voltage V	CO2 Flow l/min
 Vertical down welding	1.6	0	0.9	75~85	17~18	50~60
	2.3	1.3	0.9	85~90	18~19	45~50
		1.5	1.2	120~130	18~19	50~60
4.0	2.0	1.2	140~160	19~20	35~40	
 Vertical up welding	22	2.4	1.2	(1 layer) 120	18.0	14
				(2 layer) 140	19.5	11
				(3 layer) 140	19.5	8.2
				(4 layer) 140	19.5	5.5
				(5 layer) 130	19.0	4.0

Horizontal welding butt

Groove shapes	Plate thickness mm	Root gap G mm	Diameter mm	Num. per of layers	Current A	Voltage V	CO2 Flow l/min
	6	2	1.0	1	130~140	19~20	18~22
				2~	150~160	20~21	15~25
	12	2	1.0	1	130~140	19~20	18~22
				2~	150~160	20~21	15~25
	15	0	1.2	1~4	240~260	25~29	30~40
				5~	200~240	24~26	40~50

Fillet welding

Groove shapes	Plate thickness mm	Size of weld leg mm	Diameter mm	Current A	Voltage V	Speed cm/min	CO2 Flow l/min
	2.3	3.5~4	0.9	130~150	19~20	35~40	15
	3.2	4~4.5	1.2	150~200	21~24	35~45	
	4.5	5~5.5	1.2	200~250	24~26	40~50	
	6	5~5.5	1.2	200~250	24~26	40~50	20
	8	7~8	1.2	260~300	28~34	25~35	
	12	7~8	1.2	260~300	28~34	25~35	
	2.3	3.5~4	0.9	100~150	19~20	35~40	25
	3.2	4~5	1.2	150~200	21~25	35~45	
	4.5	5~5.5	1.2	150~200	21~25	30~40	
	6	6~7	1.2	300~350	30~36	40~45	
	2.3		0.9	100~130	20~21	45~50	15
	3.2		1.2	150~180	20~22	35~40	
	4.5		1.2	200~250	24~26	40~50	



XXI. Groove shape and welding process parameters of CO₂-shielded flux-cored welding

Location		Groove shapes	Plate thickness mm	Root gap G mm	Diameter mm	Current A	Voltage V	CO ₂ Flow l/min			
Downward welding	I shape		3.2	0	1.2	150~250	22~29	20~75			
					1.6	180~250	20~26	20~75			
			4.5	0	1.2	180~280	23~31	15~70			
					1.6	200~300	21~30	20~75			
					6	0~2	1.6	200~350	21~33	15~75	
					9	0~2	1.6	250~380	24~35	20~70	
	12	1~2	1.6	300~400	26~37	20~70					
			1.2	200~300	24~32	15~35					
	Y shape		12	0	1.2	200~300	24~32	15~35			
					1.6	300~400	26~37	15~35			
			16~25	0	1.2	250~300	26~32	15~40			
					1.6	350~400	29~37	15~40			
X shape		16	0	1.2	200~300	24~32	15~45				
				1.6	300~400	26~37	15~45				
		19~35	0	1.2	250~300	26~32	15~45				
				1.6	350~400	29~37	15~45				
				Horizontal I welding		6	0~1.5	1.2	150~250	22~29	35~55
							0~2	1.6	200~350	21~33	30~55
9	1~2	1.6	250~400		24~37	30~55					
			12		2~3	1.2	200~300	24~32	30~50		
1.6	300~400			26~37		30~50					
19~35	2~3		1.2	250~300	26~32	25~50					
			1.6	350~400	29~37	25~50					
Vertical position welding		9	2~3	1.2	150~220	22~28	4~15				
				1.6	180~230	20~27	4~15				
		19~35	2~3	1.2	180~230	23~29	4~16				
				1.6	200~240	21~28	4~16				



Fillet welding

Location	Groove shapes	Size of weld leg mm	Diameter mm	Current A	Voltage V	Speed cm/min
Downward welding		4	1.2	180~250	23~26	35~50
		6	1.2	240~280	25V28	45~65
			1.6	270~350	26~31	45~75
		8	1.2	270~320	27~30	30~45
			1.6	300~400	27~32	30~45
		Vertical down welding		4	1.2	180~240
5	1.2			200~250	23~28	50~80
6	1.2			210~270	24~30	50~80
	1.6			220~280	23~29	45~75
Vertical up welding		8~13	1.2	180~220	23~28	5~16
			1.6	180~240	21~28	4~17
Over-head welding		6 1 layer	1.2	230~260	26~30	50~65
		8 2 layers	1.2	230~260	26~30	30~35



XXII.Generation and prevention of general welding defects

To welders:

Welders, Hi. J422 welding rods manufactured by our company have good welding process. In addition, its operation, mechanical properties and chemical composition not only fully meet the requirements of national standard (GB/T5117-1995), but also obtain recognition of classification societies in eight countries, including China (CCS), UK (LR), France (BV), the United States (ABS), Norway (DNV), Germany (GL), Japan (NK) and South Korea (KR). Our company is the first in the industry passing the ISO9000 international quality assurance system certification, and it guarantees that each batch of welding rods and each one it manufactured are fully consistent with the quality standard.

J422 welding rods manufactured by our company have the advantage of good crack resistance, that is, the weld joint generally does not have crack or split.

Both crack and split refer to the cracking of the weld joint. In general, those that are hardly observed by naked eyes refer to cracks; Those that can be easily seen are splits.

Quality of the weld joint depends on four aspects:

1. Welding structure
2. Welding specification
3. Base metal
4. Welding rod

The above four aspects decide whether the quality of generated weld joints is good and satisfies quality requirements, or not.

Quality of the weld joint refers to: mechanical properties, chemical composition, crack or split, pores and undercut. In the welding process, crack or split, pores, undercut and other defects occasionally occur to the weld joint.

Here are the causes and solutions for these three defects in welding:

I. Weld joint cracking

Causes for cracking of the weld joint during welding are as below: stress, restraining force, rigidity, chemical composition, reserved gap of the weld joint, current, weld bead and cleanliness of the base metal. All these factors may result in cracking of the weld joint. Although causes are various, cracking of the weld joint may be attributed to multiple factors in each occasion, or attributed to two or three factors. However, regardless of how many factors, there must be one main factor. There are also cases in which all conditions impose no influence and only one factor results in cracking of the weld joint. Therefore, when the weld joint cracks, it is a must to correctly analyze the main and secondary factors resulting in cracking first and then take corresponding measures to solve this problem based on the above analysis.

The weld joint formed in the welding process refers to the weld joint formed by the molten welding rod and base metal under high temperature due to current. In this process, the welding rod and the base metal turn into high-temperature liquid from solid, which is accompanied by thermal expansion and then liquid turns into solid accompanied by cold contraction. Thermal expansion and cold extraction naturally makes the welding structure generate stress. Some welding structures are inherently restrained and rigid.

In the welding process, solid turns into liquid (so-called molten iron) and then liquid turns into solid, namely, weld joint is formed. Liquid turns into solid (that is, molten iron turns into grains). The process in which molten iron turns into grains is the crystallization process.

The position of the base metal with lower temperature starts to crystallize first, and then crystallization gradually extends to the



middle position, and finally occurs in the middle of the weld joint. Due to the effect of thermal expansion and cold contraction, the welding structure is affected by stress or restraining force or rigidity, so that grains of the base metal cannot connect together. In less severe cases, small crack may appear in the middle of the weld joint, while in severe cases, obvious split may appear. Even if the chemical composition of the base metal and the welding rod is good, crack or split may occur due to the restraining force and rigidity of the welded structure, as well as the stress generated in the welding process. If the chemical composition of the base metal and the welding rod is poor (high carbon, sulfur and phosphorus content); or reserved gap of the weld joint is too large, too many impurities exist at the edge of the weld joint, the current is too large, the welding speed is too fast or too low, the weld bead is too wide, etc., cracking of the weld joint will be worse. Cracking of the weld joint occurred on the welding engineering site is mostly attributed to stress, restraining force and rigidity. It can be said that stress, restraining force and rigidity are the main factors for cracking of the weld joint.

The effective way to solve cracking of the weld joint attributed to stress, restraining force and rigidity is to: Adopt fixed welding or dispersed welding. The so-called fixed welding is: First of all, adopt small current, string bead, short-distance welding to fix all weld joints of the weldment or the weld joint at important position. This makes it difficult for the weldment to generate large stress. Even if the weldment is fixed everywhere, it is not allowed to weld forward from the same position, let alone adopting large current and welding rods of large specifications. Welding shall be performed at different locations so as to avoid too much heat in local position. For rigid structures with restraining force, the same method can be adopted as a solution.

The so-called dispersed welding means performing welding at different locations, absolutely forbidding sequential welding of large structure from the same position.

For large structures, in addition to fixed welding first followed by dispersed welding, it is also required to prevent large current



and welding rods of large specifications being applied to the first weld bead. For a whole large structure, the dispersed welding shall be applied to all the weld joints. Otherwise, although there is no cracking weld joint, there is excessive residual stress.

What to do when the reserved gap of the weld joint is too large? Adopt welding rods of small specifications and small current and then perform welding along one side of the weld joint (one-sided surfacing), or perform welding simultaneously on both sides (two-sided surfacing), which depends on the reserved gap of the weld joint, thickness of the base metal and depth of the weld joint.

For the welding structure whose chemical composition of the base metal is poor, in addition to several factors above, it is also necessary to select low-hydrogen welding rods, such as J426, J427, J506 and J507, because these welding rods have excellent crack resistance. However, the above method to prevent cracking of the weld joint is also required. When the base metal or thick plate is made of medium carbon steel and other alloy steels, low hydrogen welding rods must be used.

II.Pore

The general cause for pores of the welding joint is dirty welded position, in which, there is rust, oil stain or welding slag. Therefore, besides removing impurities observed on the surface, it is also required to dry internal moisture through gas welding at the edge of the weld joint of base metal before welding for the weld joint subject to X-ray detection. The common cause for pores of the welding joint is too large current. Shapes of weld joints are diverse: Such as downward welding, vertical welding, horizontal welding, overhead welding, flat fillet welding, vertical fillet welding, thickness of the base metal, groove shape, multilayer welding and cosmetic welding. In order to avoid generation of pores in weld joints of any types, in addition to cleaning the weld groove, the current must be adjusted appropriately in the welding process. How to determine the standard of appropriate current? Please note that, the coverage volume of the molten slag is better to be half of the volume of the molten bath, absolutely for bidding less



than one third. This is because the molten iron in the welding process contains various gas, which will escape outward when the molten iron slowly solidifies under protection of the covered liquid slag.

Another cause for pore generation may be the low-quality base metal containing high sulfur content, which increases viscosity of the molten slag, affecting escape of gas. Moreover, high sulfur content produces more sulfur dioxide gas, which aggravates generation of pores.

III.Undercut

Undercut phenomenon frequently occurs in the welding process, which is not a big issue, so users usually do not reflect it. Undercut phenomenon mostly occurs at the edge of the weld joint formed by vertical welding, horizontal welding and fillet welding. The main causes for undercut include: rust on the surface of the base metal, too large current, too short retention time of the arc at the time of welding rod manipulation and improper angle of the welding rod. Undercut will not appear if the above main causes are solved.

