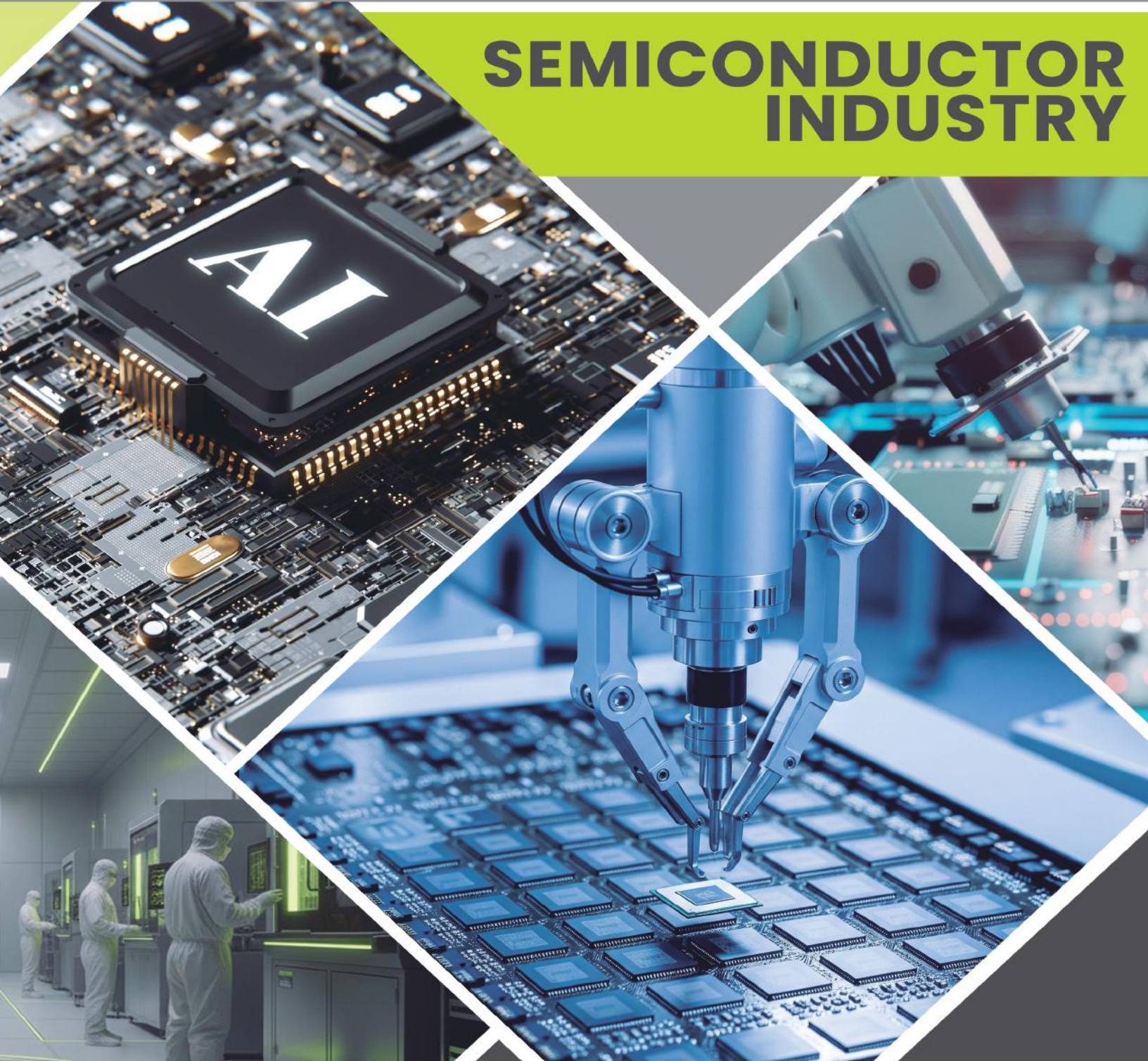
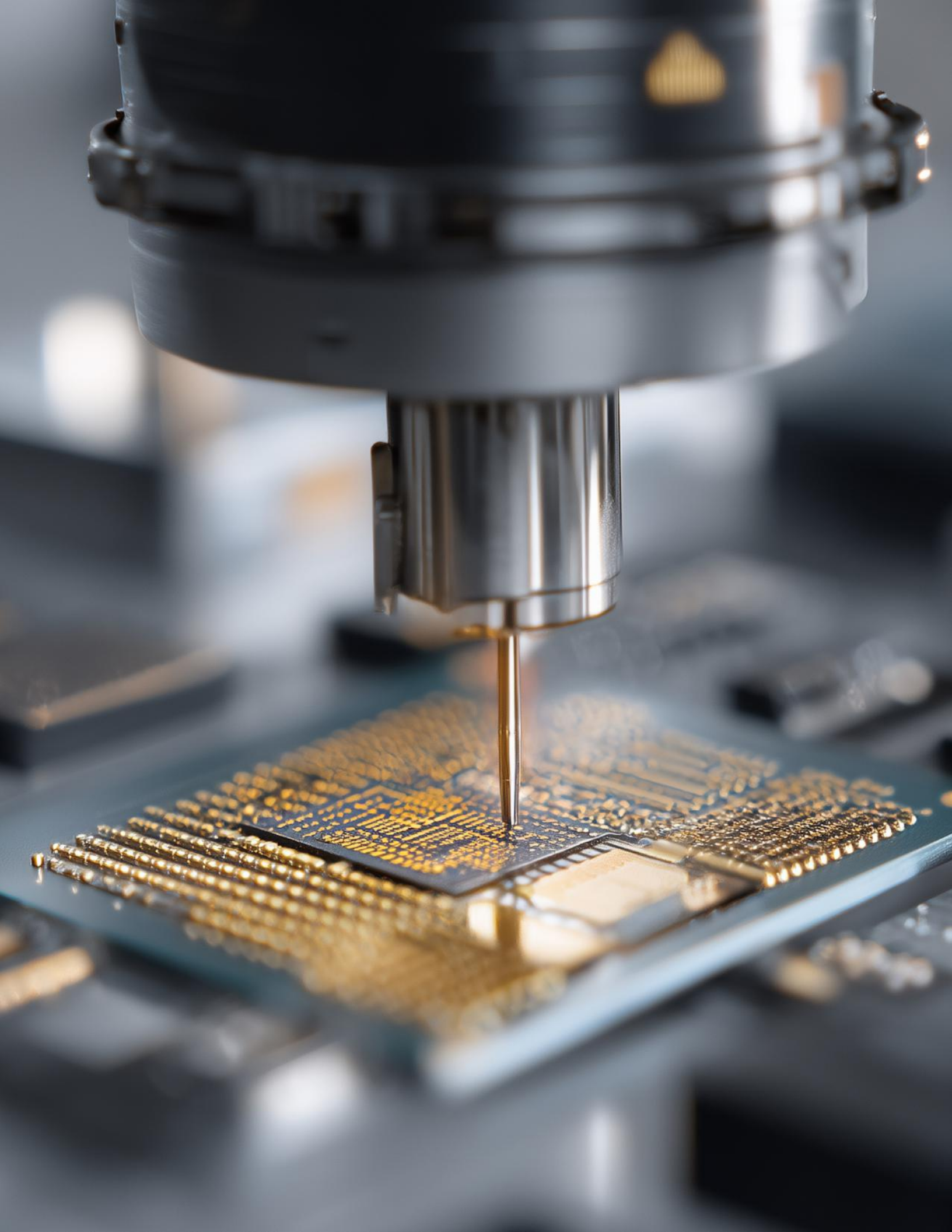


EXCELON™ HIGH PERFORMANCE SPRING ENERGIZED SEALS

SEMICONDUCTOR INDUSTRY





EXCELON™ SEALS

WHY CHOOSE SFC SEALS?

Specialty Fluid Components

Specialty Fluid Components is a global leader in high-performance seals and polymeric components. Backed by more than 35 years of combined industry expertise, we deliver advanced engineering and design solutions for the most demanding applications—especially within the Semiconductor Industry.

Our Excelon™ spring-energized polymeric seals are purpose-built to perform with absolute reliability under extreme conditions—withstanding high heat, aggressive plasma, and harsh chemicals. Because semiconductor equipment is only as dependable as the seals that protect it, SFC ensures safety, uptime, and confidence in every application.

When performance matters most, trust Specialty Fluid Components for your semiconductor sealing solutions.



Integrated Engineering

Specialty Fluid Components offers total engineering support that ensures your semiconductor components are manufactured in the most economical way, and provide optimum performance.

- Application engineering
- Material engineering
- In-house testing
- Design engineering
- Process engineering

**“CUSTOMERS TRUST US WITH THE
SUCCESS OF THEIR COMPANY”**

EXCELON™ SEALS

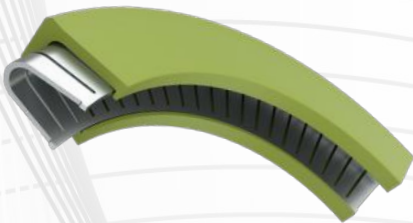
SEAL TYPES

Our Excelon™ Seals

At Specialty Fluid Components, we engineer a full portfolio of advanced spring-energized seals designed to excel in the demanding environments of the semiconductor industry.

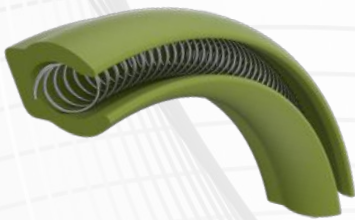
Our solid contact seals deliver consistent performance under extreme pressures, while etched spring seals provide precise load distribution for delicate interfaces. Helical wound and cantilever spring seals offer reliable resilience and recovery, ensuring long service life even in high-cycle applications. For controlled sealing directionality, our uni-directional seals maximize efficiency, and our rotary lip seals handle dynamic motion with minimal wear. In the most aggressive plasma, chemical, and thermal conditions, our double-wrapped seals provide unmatched durability and sealing integrity.

By combining robust polymer materials with innovative spring designs, SFC's spring-energized seals protect semiconductor equipment against leaks, contamination, and downtime—ensuring safety, precision, and reliability in every process step.



Solid Contact Spring Energized Seal

Engineered for maximum stability, solid contact seals deliver consistent sealing force across the entire contact surface. Ideal for semiconductor processes requiring absolute reliability, they perform under high pressure and extreme thermal cycling without loss of integrity.



Uni-Directional Spring Energized Seal

Designed for sealing efficiency in a single direction, uni-directional seals minimize friction and energy loss. In semiconductor fluid handling systems, they ensure smooth flow control while maintaining leak-free performance.



Cantilever Spring Energized Seal

Cantilever spring seals combine flexibility with strength, offering excellent deflection and recovery. They're well-suited to vacuum and plasma systems where consistent contact is critical to preventing gas leaks and equipment downtime.





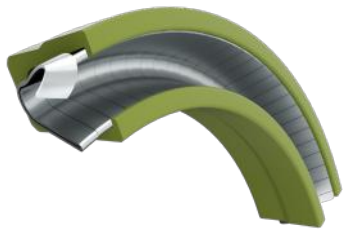
Helical Wound Spring Energized Seal

With their unique coil-like spring structure, helical wound seals maintain resilience in continuous duty cycles. Their ability to recover under repeated stress ensures long service life in semiconductor tools subject to frequent operation.



Rotary Lip Seal

For dynamic motion, rotary lip seals provide reliable sealing against rotating shafts and surfaces. Their low wear rates and tight sealing make them indispensable in wafer-handling and other rotary-driven semiconductor equipment.



Double Wrapped Spring Energized Seal

Double wrapped seals are built for the harshest service conditions, offering double barriers of protection. Resistant to aggressive chemicals, plasma, and high heat, they safeguard semiconductor tools from premature failure and unplanned downtime.



Etched Spring Energized Seal

Etched spring seals provide precision load distribution by tailoring spring geometry to application needs. This makes them an excellent fit for ultra-clean, high-purity environments where uniform sealing pressure reduces risk of contamination and leakage.



**SOLID CONTACT
SPRING ENERGIZED SEALS**



**HELICAL WOUND
SPRING ENERGIZED SEALS**



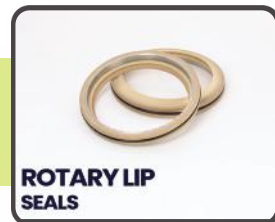
**DW SPRING
ENERGIZED SEALS**



**ETCHED SPRING
ENERGIZED SEALS**



**UNI-DIRECTIONAL
SPRING ENERGIZED SEALS**



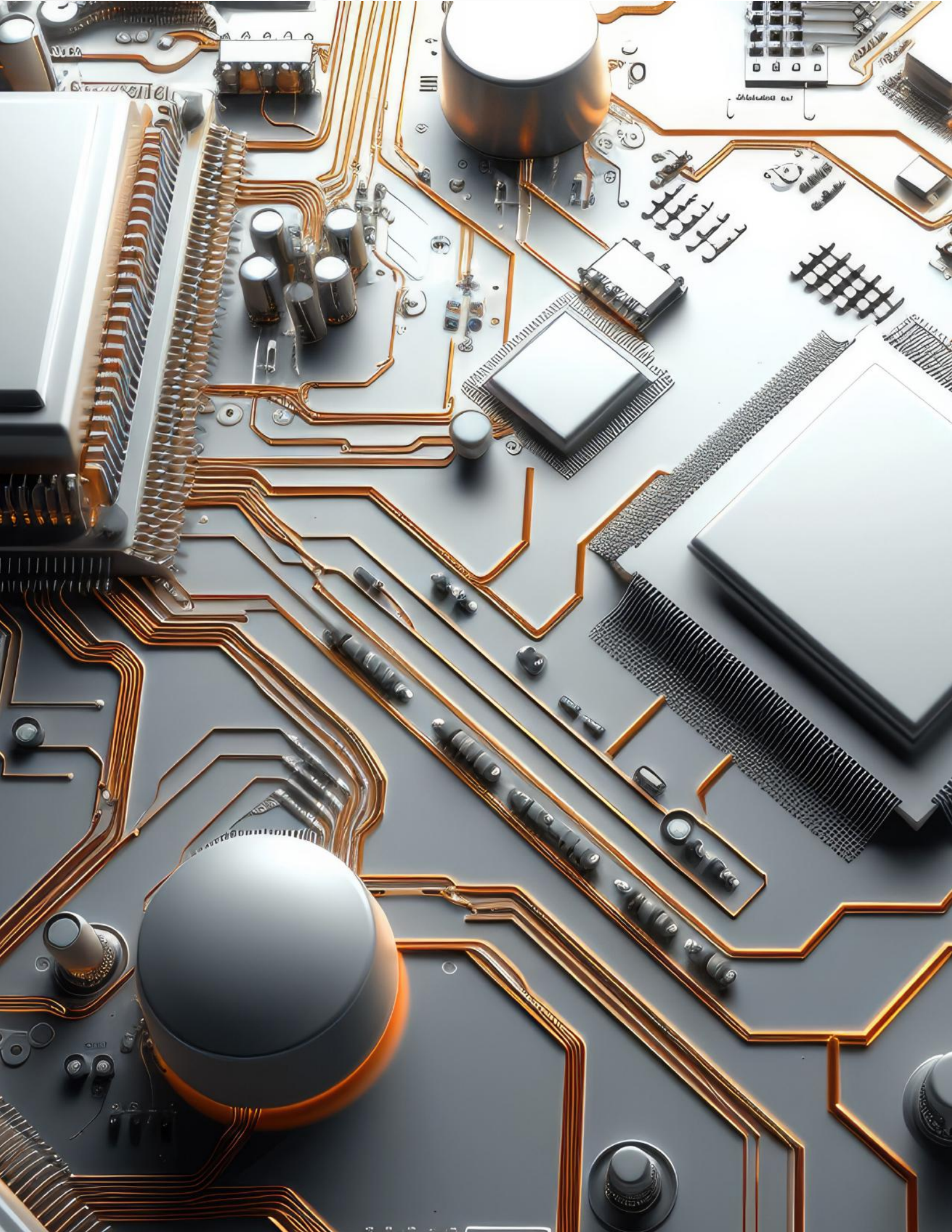
**ROTARY LIP
SEALS**



**CANTILEVER
SPRING ENERGIZED SEALS**



**MANUFACTURING
UNIQUE COMPONENTS**



EXCELON™ SEALS

SEMICONDUCTOR APPLICATIONS

Semiconductor Applications Excelon™ Spring Energize Seals

UHMW PE Spring Energized Seals
Robotic wafer handling equipment – dynamic seals at hard vacuums

PTFE Spring Energized Seals

- Processing chambers – sealing aggressive chemicals at high temperatures and hard vacuum
- Valves – for sealing in aggressive media
- Rotary vacuum pumps – rotary lip seals
- PTFE diaphragm pump – sealing the pneumatic actuator

Composite Spring Energized Seals Wafer processing:

- Wafer clamping rings
- Spin chuck surfaces
- Insulators
- Bearings and centering pins
- Vacuum pads
- Mounting screws

Water handling:

- Wafer carriers
- Vacuum strips
- Vacuum pickup tips
- Wafer pickup tips

IC handling and testing:

- Test site holders and testing sites
- Multiple mount test sites
- Quad mount frames
- Die pickup collets
- Insulators and wear strips

Characteristics Of Exelon™ Spring Energized Seals

Excellent media compatibility:

Polymers such as PTFE are chemically inert making them an excellent choice.

Low coefficient of friction:

With an extremely low coefficient of friction, PTFE does not “stick slip”.

Broad temperature range:
from -450°F to 600°F

Low wear rate:

UHMW PE's excellent wear rate reduces the chance of contamination by debris. NOTE: UHMWPE should not be used above 180°F and has limited chemical compatibility.

Tight vacuum seal:

Due to its low permeability rate and dynamic characteristics at high vacuums, UHMW PE is often used as a jacket seal material in robotics.

SEMICONDUCTOR APPLICATIONS

PHYSICAL VAPOR DEPOSITION (PVD)

Argon ions are bombarded into a pure metal target, such as aluminum, chipping away target atoms that are then deposited onto the wafer surface.



PHOTOLITHOGRAPHY

An organic polymer is applied to the wafer surface. Wafers are then exposed to light through a photomask and depending on the type of photoresist used, the exposed areas either harden or soften.

PHOTORESIST REMOVAL: ASHING : STRIPPING

Dry compounds generate neutral atomic oxygen by reacting with ozone and UV radiation of heat, or by using RF or microwave energy.



CLEANING / RINSING / DRYING

Wafers are cleaned before, during, or after most process steps.



SEMICONDUCTOR APPLICATIONS



ION IMPLANTATION

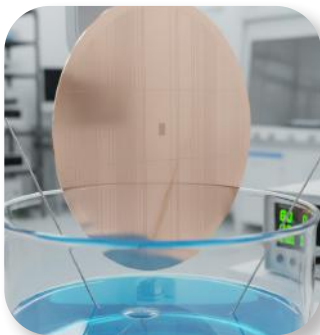
Performed at very high vacuum levels (10^{-9} – 10^{-10} Torr), an ion beam accelerates dopant (boron or phosphorous) ions to penetrate the semiconductor crystalline.

RAPID THERMAL PROCESSING (RTP)

RTP is a high temperature process that diffuses dopant ions, relaxes stresses, or deposits layers and makes it possible for single wafers to be processed very rapidly.

MATERIAL
FLUOROPOLYMER BASED

COMPOUND
THERMOPLASTICS/PTFE



ELECTROCHEMICAL DEPOSITION (ECD)

This is a bulk deposition technique commonly used for the deposition of copper conducting films.

CHEMICAL MECHANICAL PLANARIZATION (CMP)

CMP, a newer technique for wafer processing, provides a way to make uniform, multilayer semiconductor designs.





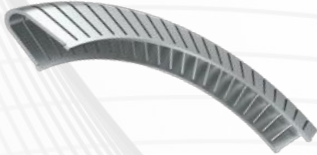

MATERIAL
FLUOROPOLYMER BASED
TEFLON ENCAPSULATED

COMPOUND
THERMOPLASTICS/PTFE
PFA/FEP



EXCELON™ SEALS

METALLIC SPRING MATERIALS

Unidirectional Coil Spring	
	302, 316 Stainless Steel
	Hastelloy®
	Inconel®
	Titanium
	Brilliant Copper
Cantilever Spring	
	Elgiloy®
	301, 304, 316 Stainless Steel
	Hastelloy®
	Inconel®
	Titanium
Etched Spring	
	Elgiloy®
	301, 304, 316 Stainless Steel
	Hastelloy®
	Inconel®
	Titanium
Helical Wound Spring	
	Elgiloy®
	304, 316 Stainless Steel
	17-7 PH
	Hastelloy®
	Inconel®
Solid Contact Spring	
	Elgiloy®
	301, 304, 316 Stainless Steel
	Hastelloy®
	Inconel®
	Titanium
Double Wrapped Spring	
	Elgiloy®
	304, 316 Stainless Steel
	17-7 PH
	Hastelloy®
	Inconel®



EXCELON™ SEALS

SFC QUALITY ASSURANCE

Broad Range of Materials

With a wide selection of advanced materials, we engineer components designed to deliver consistent, reliable performance

- PTFE: filled, unfilled
- MODIFIED PTFE
- PFA, FEP, PCTFE
- HIGH PURITY POLYIMIDE
- HIGH PURITY PEEK
- UHMWPE

Manufacturing Diversity

From single parts to runs of over one million, our state-of-the-art facility delivers the most cost-effective manufacturing solutions to meet your exact needs.

PTFE

- Compression molding
- Ram extrusion
- Isostatic molding
- Core molding
- Ball forming

Thermoplastic

- Injection molding
- Melt extrusion
- Melt compression molding
- Transfer molding

Custom machining

- Conventional
- Automatic
- CNC

Total Quality Assurance

At Specialty Fluid Components, quality is more than a certification—it's the foundation of everything we do. Our ISO 9001 certification represents a company-wide commitment to producing components that are consistent, precise, and built to the highest standards. Every order we deliver reflects our pledge to provide customers with repeatable quality they can count on.

To uphold this promise, we maintain strict quality control procedures throughout the entire lifecycle of each component. From initial design and material selection to machining, assembly, and final inspection, every step follows documented processes and rigorous standards. This disciplined approach ensures that each part not only meets specifications but also performs reliably in the most demanding environments.

Our customers trust us because we pair advanced technology with a culture of accountability. Continuous training, process improvement, and state-of-the-art inspection equipment enable us to detect, correct, and prevent issues before they leave our facility. With Specialty Fluid Components, you don't just receive parts—you receive confidence that every seal, component, and solution will deliver lasting performance and safety in critical applications.



ISO 9001: AND AS9100D CERTIFIED

ENGINEERING DESIGN REQUEST FORM



DOWNLOAD THE EDR AT WWW.SFCSEALS.COM

ENGINEERING DESIGN REQUEST FORM

CUSTOMER INFORMATION

COMPANY NAME _____ PURCHASING CONTACT _____
PHONE _____ EMAIL _____
STREET _____ CONTACT PHONE _____
CITY, ST, ZIP _____
COUNTRY _____ ENGINEERING CONTACT _____
EMAIL _____
COMPANY WEBSITE _____ PHONE _____

PROJECT NOTES DESCRIBE YOUR PROJECT HERE

SALES INFORMATION

QUOTE QUANTITIES OF _____
DEVICE SEALED _____
DATE PROTOTYPES REQUIRED _____
TARGET PRICE \$ _____

IS THERE A SOURCE OR SPEC CONTROL DRAWING (Y/N)?

IF YES, PLEASE EMAIL THE HARDWARE DRAWING ALONG WITH THIS FORM TO SALES@SFCSEALS.COM

DO NOT FILL THIS SECTION OUT - FOR OFFICE USE ONLY

APPLICATION/PART INFO

EDR NO. _____
APPLICATION (NEW, EXISTING) _____
CUSTOMER (NEW, EXISTING) _____
PRODUCT:
__SES __RLS __EES __MACHINE COMPONENT
__DRAWING CHANGE __NEW DESIGN

WRITTEN BY _____ DATE _____

SEAL STYLE AND MATERIAL

SIMILAR TO P/N _____
SEAL TYPE _____
SEALING ELEMENT MATERIAL _____
ENERGIZING MATERIAL _____
SEAL CASE MATERIAL _____
BACK-UP RING MATERIAL _____

OPERATING CONDITIONS

OPERATING CONDITION DATA

				MINIMUM	OPERATING	MAXIMUM
#	___ °K	___ °F	___ °C	_____	_____	_____
PRESSURE:	___ PSI	___ Bar	___ MPa	_____	_____	_____
STROKE LENGTH:	___ inch	___ mm		_____	_____	_____
CYCLE RATE:	___ /min	___ /hr	Hz	_____	_____	_____
OSCILLATORY:	___ deg.	___ rad.		_____	_____	_____
VACUUM:	___ in.Hg	___ torr		_____	_____	_____
VELOCITY	___ ft/min.	___ m/sec.		_____	_____	_____
RPM				_____	_____	_____

SHAFT ROTATION: (AS VIEWED FROM AIR SIDE OR LOW PRESSURE SIDE OF SEAL) _____

PV (psi-ft/min, MPa-m/sec) _____

PROOF PRESSURE (UNITS) _____

BURST PRESSURE (UNITS) _____

ALLOWABLE LEAKAGE (UNITS) (DROPS, cc/mm) _____

MEDIA TO BE SEALED _____

FRICITION: ___ lbs. ___ oz. ___ gms BREAKOUT: _____ DYNAMIC: _____

FRICITION: ___ lbs. ___ oz. ___ gms BREAKOUT: _____ DYNAMIC: _____

TORQUE: ___ ft-lbs ___ in-oz ___ gm-cm BREAKOUT: _____ DYNAMIC: _____

LIFE REQUIREMENT (CYC., HRS., YRS.) _____

DUTY CYCLE _____

TYPE OF SEAL EVALUATION: ___ BENCH ___ FIELD ___ BOTH ___ EXPLAIN

MOST CRITICAL PERFORMANCE CRITERIA: _____

CONTAMINATION (TYPE): _____

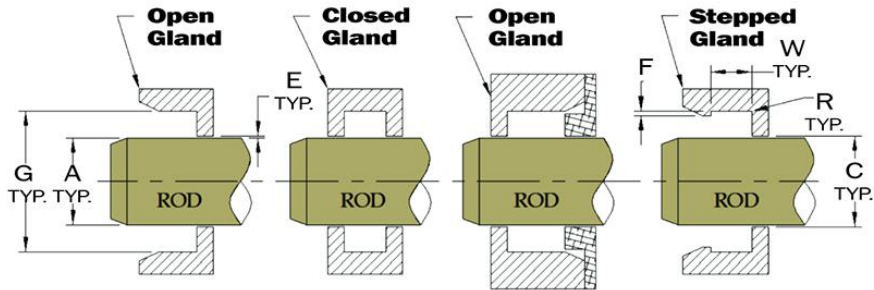
SEAL TYPE (ROD, PISTON, FACE): _____

GLAND TYPE:
 ___ SPLIT ___ OPEN ___ SOLID
 ___ STEPPED ___ IRREGULAR
 ___ REF. 1ST PAGE ___ REF. 4TH PAGE

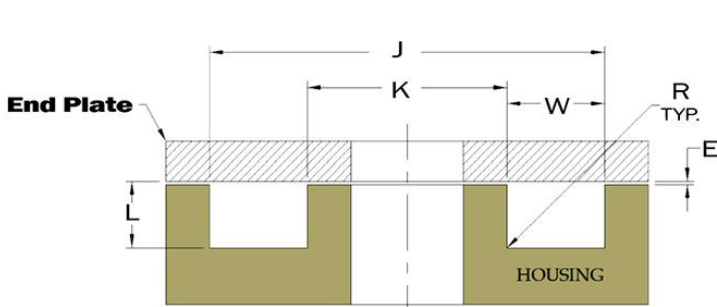
CAN HARDWARE BE CHANGED? ___ YES ___ NO
 IF YES, PLEASE EXPLAIN. _____

METRIC: ___ YES ___ NO

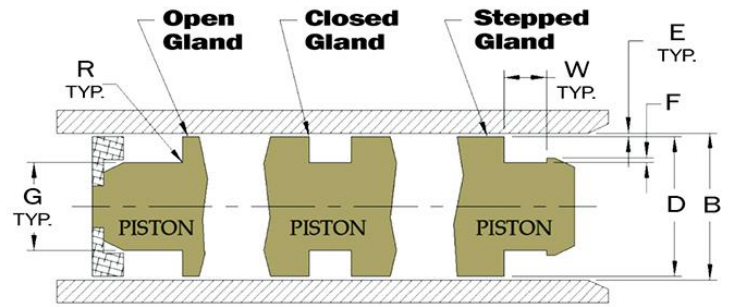
OPERATING CONDITIONS



ROD SEALS



FACE SEALS



PISTON SEALS

GLAND SPECS	MINIMUM	OPERATING	MAXIMUM	FINISH	HARDNESS	COATING
A -Rod Diameter	_____	_____	_____	_____	_____	_____
B -Bore Diameter	_____	_____	_____	_____	_____	_____
G -Groove Diameter	_____	_____	_____	_____	_____	_____
C -Rod Bore	_____	_____	_____	_____	_____	_____
D -Piston Diameter	_____	_____	_____	_____	_____	_____
J -Gland O.D.	_____	_____	_____	_____	_____	_____
K -Groove I.D.	_____	_____	_____	_____	_____	_____
L -Groove Depth	_____	_____	_____	_____	_____	_____
W -Groove Width	_____	_____	_____	_____	_____	_____
R -Groove Radii	_____	_____	_____	_____	_____	_____
E -Extrusion Gap	_____	_____	_____	_____	_____	_____
F -Step Height	_____	_____	_____	_____	_____	_____
Runout (TIR)	_____	_____	_____	_____	_____	_____
Sideload (lbs, Newtons)	_____	_____	_____	_____	_____	_____



SPECIALTY FLUID COMPONENTS



Specialty Fluid Components is proud to be AS9100D certified and listed in the IAQG OASIS (Online Aerospace Supplier Information System). Customers and industry partners may verify our certification status by searching for Specialty Fluid Components in the OASIS database at <https://www.iaqg.org/oasis>

**SPECIALTY FLUID
COMPONENTS**

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www.sfcseals.com

