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COATINGS AND ANTI CORROSION ENGINEERING REVIEW

August - September 2025 | Volume 16 Issue 3 | ₹100



Striving for a corrosion-free India



Interview
Dr Sangeeta Srivastava
*Executive Director,
Godavari Biorefineries Ltd*

Technical Feature
**Corrosion concerns in vehicle exports from India:
Causes, risks and solutions**

New Products & Processes

Industry News

Company Profile

Case Study



Barrel Transfer Pump

3:1 ratio pumps with Quick Connect technology

Material Heaters

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 - Gas flow epoxy coatings
 - Jet Fuel coatings

OEM COATINGS

- Quick drying primer & top coats, low bake & stoving systems
 - Thermosetting acrylics
 - Hi gloss polyester top coats
 - Low bake polyurethane
- Casting sealers & unicoat epoxy chassis black

MARINE COATINGS

- Marine enamels & epoxy coatings
- Prefabrication primers
- Ballast tank coatings
- Under water coatings
- Antifouling coatings

Architectural Coatings

- External coatings
- Internal coatings
- Hygiene coatings
- Anti carbonation coatings

FLOOR COATINGS

- Penetrating Primer
 - Screed
- Solvent less Epoxy
- Solvent less PU



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COATINGS AND ANTI CORROSION ENGINEERING REVIEW

From the Editor-in-Chief...



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Corrosion remains a significant challenge to India's industrial growth, resulting in considerable economic losses and undermining public safety. India loses over Rs 12 lakh crore every year to corrosion-related damage. This is equivalent to nearly 4.2 percent of the country's GDP. With nearly 90 percent of industries depending on steel, and 25 – 33 percent of it lost to rust, surface engineering must be treated as a national priority!

While a completely 'Corrosion-free India' is likely an aspirational goal, significant strides are being made through various measures, including research, awareness campaigns, and the adoption of corrosion-resistant materials and technologies.

There has to be a concerted effort if we have to be anywhere near a Corrosion-free India. We may not be able to eradicate corrosion all of a sudden, but it can be done gradually. The cost of corrosion is around 2.1 percent of the GDP in the USA, and in Japan, it is around 1 percent. So, India with 4.2 percent is losing quite a lot of money! But to have a Corrosion-free India, there has to be a thrust on education and training.

AMPP, a world leader in standards and training has recently designated India as a separate area to focus on, reflecting the organization's recognition of the region's significant growth and engagement in the materials protection and performance field. There are many new developments happening around the world in the field of corrosion management in terms of new technologies, Artificial Intelligence, Machine Learning, etc. Workforce development is one focus area of AMPP through their various courses, certifications, and seminars.

There is always a shortage for a skilled workforce, and we need to tackle this challenge, by equipping a workforce that will work towards combating challenges related to corrosion. After all, India is a leader contributing to the global workforce.

The AMPP India Area comprises 6 chapters and 7 student chapters. AMPP Kerala Chapter is the latest one that was inaugurated a couple of weeks ago. A report on the inauguration appears in this issue, besides all our regular features and columns. And, as a bountiful monsoon comes to an end and the festive season begins, let me take this opportunity to wish you all a great time ahead!

Jolly Lonappan
Editor-in-Chief



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CORROSION, ABRASION & CHEMICAL ATTACKS destroy crores of rupees worth equipment every year. Worldwide research shows that nearly 70%-80% equipment failures are purely due to their surface erosion. The need for effective preventive maintenance therefore is imperative.

The time has arrived for ceramics to finally take centre stage. Jyoti Ceramic Industries has specially developed ceramic filled polymer based coating compounds, "Aluma Coat® -BR" brushable / sprayable and "Aluma Coat® -TW" trowelable.



VERSATILE INDUSTRIAL APPLICATIONS



Motor Shaft
Coated with
Aluma Coat - BR



Butterfly Valve
Coated with
Aluma Coat - BR

Aluma Coat® - BR

A brushable / sprayable easy to apply coating designed to protect surfaces from severe turbulence, corrosion, erosion and chemical attacks. It gives a satin smooth, high-gloss surface finish and can withstand maximum service temperature up to 150°C/302°F



Aluma Coat® - TW

A trowelable, easy to apply protective coating, comprising of sintered sapphire-hard ceramic micro beads, doped in polymer resins designed to resist corrosion, abrasion and moderate surface impact. It gives a rough textured surface finish and can withstand maximum service temperature up to 150°C/302°F.



VERSATILE INDUSTRIAL APPLICATIONS



Mineral Crusher
Coated with
Aluma Coat - TW



Inner Base of Dust
Collector Coated with
Aluma Coat - TW

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Dunn-Edwards' ULTRASHIELD, a new series of heavy-duty industrial coatings

Dunn-Edwards Corporation has announced the launch of the ULTRASHIELD – a heavy-duty industrial maintenance coatings series designed with professionals in mind. With three different coating options, ULTRASHIELD offers an unmatched solution for commercial, water and wastewater, bridge and highway, healthcare, and various other projects – extending the service life of surfaces, structures, and equipment, notes a press communiqué from the company.



The ULTRASHIELD series is engineered to protect surfaces where increased durability is a must.

“As a response to the rising demand for long-term asset protection in industrial projects, I'm elated to be pushing forward a line of two-component, problem-solving technology solutions engineered to meet the protective needs in moderate and severe environments,” said Tim Bosveld, Vice President of Product Management at Dunn-Edwards. “ULTRASHIELD provides the critical corrosion, chemical, and abrasion resistance at every stage of the coatings project, allowing you to focus on what's most important – getting back to work and serving your customers at full capacity.”

The ULTRASHIELD series comprises a complete line of

base coats and topcoats to meet the needs of any service environment.

ULTRASHIELD Aluminum Epoxy is a low-VOC, high-performance, aluminum-filled, micaceous iron oxide (MIO) epoxy engineered to provide excellent corrosion protection on marginally prepared steel. For use on metal, masonry, and steel, this base coat/primer can extend service life and enhance film strength with a fast cure rate.

ULTRASHIELD Epoxy Penetrating Sealer is a high-solids, high-performance, universal tie-coat engineered to provide exceptional wicking characteristics that result in

outstanding adhesion to a variety of marginally prepared bare and previously coated surfaces. This base coat/primer allows specifiers flexibility of topcoat options and helps to extend the service life.

ULTRASHIELD Gloss Water-Based Epoxy is a high-performance, water-based epoxy engineered to provide very good chemical, corrosion, and abrasion resistance on drywall, concrete, and properly primed steel surfaces. This base coat/primer and topcoat has a fast cure rate, enabling a quick return to service, and is resistant to repeated chemical cleanings.

ULTRASHIELD Gloss Epoxy is a high-performance, high-build, highly chemical- and

Covestro launches advanced flame-retardant encapsulation foam for EV batteries

Covestro has unveiled its next-generation flame-retardant encapsulation polyurethane foam technology, addressing one of the most critical challenges in electric vehicle (EV) adoption worldwide: battery safety. This innovation strengthens Covestro's position as a trusted materials partner in the evolving EV value chain.

Covestro's newly launched Baysafe® BEF flame-retardant encapsulation foam series is designed to minimize thermal propagation between battery cells – tackling a key safety concern that has challenged consumer trust in EVs. The lightweight foam delivers superior flame-retardant performance by effectively inhibiting fire spread, significantly enhancing battery safety in applications ranging from EVs to portable energy storage systems.

“This innovation represents a significant step toward enabling sustainable mobility through enhanced safety,” said Akhil Singhania, Global Head of PU Specialties in Covestro's Tailored Urethanes Business Entity. “By launching our advanced flame-retardant technology, Covestro reaffirms its commitment to innovation and strengthens our product portfolio to meet the

corrosion-resistant epoxy ideal for use on concrete and steel surfaces. This base coat/primer and topcoat boasts outstanding adhesion and tolerance on marginally prepared surfaces, extending service life, reducing maintenance costs, and increasing overall production.

ULTRASHIELD Acrylic Polyurethanes are high-



Baysafe® BEF (blue foam) is specially developed to enhance battery safety in electrical vehicles by helping limit thermal propagation between cylindrical cells.

evolving needs of the EV industry.”

This development comes at a pivotal time as EV adoption accelerates globally and safety regulations become more demanding. As Chinese automotive companies expand internationally, Covestro's innovative materials solutions illustrate how technological advancements support successful cross-border market growth.

Beyond encapsulation foams, Covestro offers a wide range of polyurethane-based solutions for EV batteries, including battery covers and shock-absorbing materials. The new Baysafe® BEF technology further strengthens Covestro's position in the fast-growing new energy sector, supporting safer, more reliable electric mobility applications such as new energy vehicles and e-bikes, as well as portable battery generators.

performance coatings engineered to provide superior impact and abrasion resistance with a durable finish. This ultra-weatherable topcoat saves time and money by reducing maintenance costs, as it can be recoated indefinitely, and is best suited for concrete, metal, or other surfaces that require maximum protection.

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Reactor 3 H-XP2

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Hempel launches Hempaguard NB, the first silicone hull coating for newbuilds

Hempel's latest innovation is designed specifically for shipyard application, bringing Hempaguard's proven fuel savings and fouling protection to newbuild vessels from day one. This means that vessels can now benefit from Hempaguard throughout their entire service life, notes a press release from the company.

cause delays and additional costs.

"Hempaguard NB brings the industry's most advanced silicone hull coating technology, proven to deliver significant fuel savings and reduce emissions, into the newbuilding phase for the very first time," says Alexander Enström, Executive

PHOTO: HEMPEL



Hempaguard NB - a breakthrough high-performance silicone hull coating is designed specifically for newbuild vessels.

Hempaguard NB - a breakthrough high-performance silicone hull coating is designed specifically for newbuild vessels. For the first time, shipowners and shipyards can access Hempaguard's trusted fuel savings and fouling protection during the construction phase, marking a major step forward in hull coating innovation.

Until now, applying advanced silicone coatings during the newbuilding process has posed logistical challenges for shipowners. Conventional silicone solutions require controlled environments and are typically applied either pre-delivery or in post-delivery dry dockings, both of which

Vice President and Head of Marine at Hempel A/S. "Developing Hempaguard NB meant reimagining how silicone coatings are formulated for the construction phase, delivering a solution that maintains long-term performance without the need for post-delivery application. It's a technical breakthrough that ensures vessels are equipped with proven, high-efficiency fouling protection from the very first day at sea."

It combines the tried-and-tested performance of Hempaguard X7 with a revolutionary new silicone topcoat, made specifically for newbuilds. This means that it offers the same exceptional performance as Hempaguard

Innovative UV stabilizing system for polyamide-based outdoor applications from BYK

BYK has introduced an innovative solution for the long-term UV stabilization of polyamides and polyolefin composites.



BYK-MAX LS 4128 application in an automotive front bumper.

The new additive was specifically developed to preserve the properties and surface quality of plastics in the long term when exposed to light, since polyamide-based components suffer a deterioration of their properties and surface quality when subjected to longer-lasting exposure to light. Besides deterioration in physical properties, this often also results in changes in color and gloss. On account of their mechanical strength, temperature resistance and versatility, polyamides are indispensable in many sectors – from the automotive industry, construction materials, and consumer and leisure products all the way to fibers and textiles. But UV radiation can lead to discoloration, loss of gloss, and material degradation.

BYK-MAX LS 4128 addresses this challenge with a synergistic additive of

highly concentrated stabilizers that effectively hinders light-induced degradation processes in the polyamide. In doing so, the additive acts as a radical catcher and peroxide decomposer, protecting both the visual and the mechanical properties of the materials, notes a press communiqué from the company. The new BYK product is a granulated, organic UV stabilization system that was specially developed for use in polyamides as well as in polyolefins. It is especially well suited for outdoor applications.

A welcome side effect: The high level of active ingredients it contains minimizes the need for carrier resins, thereby reducing the overall costs for customers. Thanks to BYK's proprietary technology, BYK-MAX LS 4128 is a flowable product that is easy to handle.

X7 - with nearly 5,000 applications and independently verified for its fuel-saving and decarbonization benefits. Shipowners can expect up to 20% fuel savings, only 1.2% average speed loss and 120 fouling-free idle days.

Not only does this give customers premium performance straight out of dock, but also a long-term asset for operational efficiency and regulatory compliance, unlocking the full potential of silicone coatings for newbuilds and giving shipyards a competitive edge.

PHOTO: ADOBE STOCK/BYK



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MFFT



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Elcometer introduces the all new Elcometer Tornado Airless Pumps

Elcometer, a global leader in coating inspection, surface preparation and spray equipment, has launched the Elcometer Tornado Airless Pumps, a breakthrough in high-performance airless spraying technology, notes a press communiqué from the company. Developed by spray painters, for spray painters, the Elcometer Tornado redefines industry standards with superior quality, reduced maintenance, and extended operational lifespan, ensuring unmatched durability and precision for the industrial and marine protective coatings industries. The Elcometer Tornado Airless Pumps are the result of an exhaustive three-year development process, which included more than 13 million pump cycles and over 3,600

hours of extensive laboratory and field trials. Tested across a wide range of marine and protective coatings, in temperatures from -3°C to 52°C (27°F to 126°F), the Elcometer Tornado Airless Pump proved its ability to deliver consistent, high-performance spraying which withstands harsh environments, and resists wear and tear, the press communiqué notes. Engineered to tackle heavy-duty coating applications, the Tornado is available in two models:

Engineered to tackle heavy-duty coating applications, the Tornado is available in two models:

- Tornado 71 (71:1) – Max outlet pressure of 425 bar (6,164 psi)
- Tornado 43 (43:1) – Max outlet pressure of 260 bar (3,771 psi)

Both models offer exceptional power for thicker coatings and faster application speeds, ideal for industrial, marine, and protective coating projects.

Features & innovations

- Reliable performance – Engineered with stainless steel and tungsten carbide components, the Elcometer Tornado is built to last, delivering consistent performance in the toughest conditions.
- Advanced engineering – Designed for smooth changeovers, low pulsation, and easy onsite maintenance, minimizing downtime and maximizing productivity.
- Quiet & efficient spraying – Featuring anti-icing technology, dual exhaust silencers, and aerospace-inspired insulated poppet switches, ensuring whisper-quiet operation, even in extreme temperatures.



Tested across a wide range of marine and protective coatings, in temperatures from -3°C to 52°C, the Elcometer Tornado Airless Pump delivers consistent, high-performance spraying which withstands harsh environments, and resists wear and tear.

Controlled climate, lasting protection: The science behind durable coatings

The success of any anti-corrosive coating depends not just on formulation or surface preparation, but on the environmental conditions during application. High humidity, fluctuating temperatures, and condensation can cause flash rust, blistering, poor adhesion, and early coating failure.

For structures like tanks, pipelines, and reactors, maintaining controlled temperature, humidity, and dew point is essential.

Specifications recommend keeping RH below 55%, maintaining a -5°C dew point differential between the air and the steel surface, and a -12°C dew point differential between the air inside and outside the tank. Without this, even the best surface prep can fail.

Engineered dehumidification systems, particularly

desiccant-based units with integrated blowers and condensing modules, help create stable conditions – regardless of season or geography. These systems prevent rust bloom, reduce downtime, and can extend coating life by 1.5 - 2x. Remarkably, they represent a very low portion of the total



Engineered dehumidification systems, prevent rust bloom, reduce downtime, and can extend coating life by 1.5 - 2x.

treatment cost for corrosion-preventive painting, while delivering substantial returns in reliability and reducing the need for rework.

Solutions like those offered by TDS have supported contractors in achieving year-round reliability in coating projects. For technical assistance, write to tds@pahwa.com.

- Simple maintenance – Equipped with quick-release piston technology, field-replaceable elcoTOUGH™ long-life packings, and a rapid-change suction hose, optimizing reliability and ease of servicing.
- Innovative two-way seat technology (patent pending) – Allows for rapid switching between low and high viscosity coatings in under five minutes, enhancing versatility.
- Dual spray gun capability – Supports two spray guns,

ensuring greater efficiency in large-scale coating applications.

- Robust mobility – Features roller-bearing airless tyres, integrated tool storage, and pre-fitted hopper attachment points for ease of movement and convenience.
- Enhanced operator safety – Includes an accessible bleed valve, ensuring controlled purging under high pressure for improved safety.

The Elcometer Tornado Airless Pump is now available through Elcometer distributors worldwide.



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CRISIL Rating : SME 1 'Highest'



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Sherwin-Williams accelerates coatings applications with single-coat high-performance Acrolon™ 680

Sherwin-Williams Protective & Marine is helping make coating applications faster and longer lasting for an array of industrial- and marine-related assets with the new Acrolon 680 single-coat topcoat. The high-performance direct-to-metal (DTM) polyurethane coating delivers notable efficiencies, reducing application time and material usage via its minimal surface preparation requirements, quick dry times and excellent one-coat coverage. The high-volume-solids coating answers fabricators' and owners' needs for speed, durability and aesthetics in an easy-to-apply formulation that performs in the shop and the field, notes a press release from the company.



Acrolon 680 delivers outstanding chemical resistance and a tougher, more durable finish than traditional acrylics and alkyds.

Application of Acrolon 680 is simplified and accelerated through a combination of capabilities. First, the high-solids polyurethane can be applied to marginally prepared surfaces, specifically SSPC-SP2 hand tool cleaned surfaces with tightly adherent rust. In addition, Acrolon 680 can be applied DTM in a single, high-build coat, eliminating the time required for installations of comparable multi-coat acrylic or alkyd systems. It also offers a faster return-to-service compared to acrylics or alkyds. Finally, applicators

have the flexibility to apply the coating by spray, brush or roller.

“Acrolon 680 provides simplified, yet robust, protection for surfaces not prepared with advanced methods, whether you're producing new components, equipment or structures, or you're cleaning up your existing assets,” says Paul Trautmann, Marketing Director, Infrastructure, Sherwin-Williams Protective & Marine. “It can be used anywhere steel needs a single-coat and long-term protection. Given its ease of application, Acrolon 680 is the premier choice for production efficiency.”

Acrolon 680 delivers outstanding chemical

resistance and a tougher, more durable finish than traditional acrylics and alkyds. This volatile organic compound (VOC)-compliant coating features 65% volume solids and contains less than 340 g/L VOCs, making it a high-performance solution for a wide range of industrial applications.

Ideal for use on tanks, piping, valves, structural steel, marine vessels and equipment exposed to harsh chemical processing environments, Acrolon 680 provides reliable protection and long-lasting performance.

This technology meets SSPC Paint 36 standards and provides a high-gloss finish and excellent color retention to assets, ensuring a vibrant, professional appearance even under extreme ultraviolet exposure and weathering. The coating is also fully customizable to any color.

Metrohm DropSens μ Stat-i MultiX: Empowering advanced corrosion research

The Metrohm DropSens μ Stat-i MultiX is a multichannel bipotentiostat, galvanostat, and impedance analyzer that utilizes MultipleIS® technology to



The Metrohm DropSens μ Stat-i is designed for multi-user and multi-disciplinary laboratory research teams seeking for a solution that covers their current and future needs.

enhance multi-user, multidisciplinary corrosion research. This instrument is dedicated to multi-user and multidisciplinary laboratory research teams seeking a solution that meets their current and future needs, notes a press release from the company's agent in India, Khushboo Scientific.

When looking for a comprehensive system for electrochemical analysis and research, the μ Stat-i MultiX is an effective solution. The system is suitable for working not only with screen-printed electrodes, but also with conventional set-ups.

μ Stat-i MultiX's high number of channels available (up to 16) allows the possibility of simultaneous work by several users working totally independently. Moreover, the flexibility of the user's location is made possible by the remote connection that allows them to perform measurements or treat the resultant data without the need to be close to the instrument. As a result, it is easier to multiply working teams and save time.

The available electrochemical techniques and specifications in μ Stat-i MultiX and the reliability and

ease of use of the DropView 8400M software make this instrument suitable for a wide variety of applications, such as hydrogen permeation, fundamental electrochemistry, electrocatalysis, sensors, corrosion, or coin-cell batteries.

μ Stat-i MultiX allows choosing initially between four different models available: μ Stat-i Multi4, μ Stat-i Multi8, μ Stat-i Multi12 and μ Stat-i Multi16. Additionally, the system's versatility allows it to expand the number of channels at any time after purchase.

Electrochemical methods and techniques have conquered a wide range of analytical applications in fields such as: agriculture, defense and security, environment, biotechnology, clinical, or food analysis. Advances in these fields have led to a substantial increase in the expansion of electrochemistry into new methodologies and sectors, and in the volume of research, as it has demonstrated its great potential to solve real-life analytical problems.

More details: sales@khushbooscientific.com



VR COATINGS PVT. LTD.

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PFP / INTUMESCENT COATING SYSTEM



About Us

VR Coatings is an ISO, ATEX certified company based in Pune, India since 1985.

We are engaged in the Manufacturing and Installation of fluid handling equipment. It is especially used for spray painting of high viscous solventless coating, Passive fire protection coating, solventless epoxy coating, waterproofing, polyurea coating, grouting, marine coating etc.

It is applicable in various segments like automotive, construction, pipe manufacturing, heavy engineering, bridge painting, container manufacturing etc.

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Jotun introduces the next generation Hull Performance Solutions HPS 2.0

HPS 2.0 presents a significant enhancement to the HPS that was introduced in 2011

Jotun, the global leader in marine coatings, has announced the launch of the next generation of its recognised Hull Performance Solutions (HPS). HPS 2.0 presents a significant enhancement to the HPS that was introduced in 2011. Included in HPS 2.0 are two new products for different trades and environments, alongside the established and newly speed-loss verified SeaQuantum X200, best-in-class technical service, hull condition management and performance guarantees to deliver a solution that is Tailored to trade™.

“We are thrilled to present HPS 2.0, a testament to our Clean shipping commitment and our focus on innovation that has been ongoing since

1926. This enhanced solution, consisting of products, services, data and our credible performance guarantees is designed to meet the evolving needs of our customers, ensuring optimal hull performance and supporting their ESG ambitions,” said Morten Sten Johansen, Global Category Director for Hull Performance in Jotun.

HPS 2.0 will include four elements that in combination will optimize vessel efficiency: Jotun's best antifouling technologies – tailored to trade, technical service from the industry's largest team of coatings advisors, intelligent hull condition management and credible performance guarantees.

Jotun's best antifouling technologies

Solutions tailored to specific needs are crucial as various trade patterns and operating environments each require specific coatings for optimal efficiency.

□ For predictable trades - SeaQuantum X200 is Jotun's flagship SeaQuantum antifouling with 15 years track record of maximizing hull performance with close to 2,000 deep-seagoing vessel applications, delivering high performance for predictable trades. DNV has recently

verified the average 1.0% speed loss of SeaQuantum X200 based on analysis done as per ISO 19030, which is also presented at Nor-Shipping for the first time to the industry.

□ For high fouling intensity trades - SeaQuantum XT is



Morten Sten Johansen, Global Category Director for Hull Performance in Jotun.

PHOTOS: JOTUN



With nearly 100 years of experience navigating unknown waters, Jotun remains committed to innovating and developing advanced products and solutions that cut carbon emissions, preserve fuel and protect biodiversity.



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Jotun's newest SeaQuantum antifouling, more robust for high fouling intensity trades. At the centre of this advancement is Jotun's ActiCore™ technology, building on the unique and patented in-house binder combination and an optimized high-performance biocide package. This technology is designed to deliver consistent, reliable protection against intensified fouling threats.

□ For unpredictable trades - SeaQuest Endura II is a new high performing, tin-free biocidal FRC giving vessels flexibility in unpredictable trades. At the centre of this advancement is Jotun's Flexcure™ technology, which delivers exceptional levelling properties, optimized curing speed, and extended repairability.

A recent study, presented by Jotun during Nor-Shipping 2025, showcases the need for various antifouling technologies and that there is still an untapped opportunity for many ship owners and operators when it comes to optimizing the hull performance.



DNV recently verified that Jotun coated vessels avoided 11.1 million tonnes CO₂ in 2024, or worth approximately 2 billion USD in fuels.

“Although various antifouling technologies are available, their effectiveness is dependent on the marine environment, trade patterns and the predictability of the trades. A tailored approach to antifouling, can help ship owners and operators achieve optimized effectiveness,” said Morten Sten Johansen in Jotun.

“However, 1 in 5 ship owners and operators are aware that they are not using the most effective antifouling coating for each vessel in their fleet today. The impact of having optimized hull performance for the entire fleet is massive. DNV recently verified that Jotun coated vessels avoided 11.1 million tonnes CO₂ in 2024, or worth approximately

US\$ 2 billion in fuels, so there are definitely big gains to be made, both on an environmental and economical level, for each operator and for the industry as a whole.”

Unmatchable technical service

With more than 1,200 coating advisors worldwide, Jotun provides unmatched technical service to ensure optimal hull performance. Jotun's experts will as a part of HPS 2.0 provide on-site support and tailored recommendations to maximise efficiency and longevity and ensure application of coatings is to the highest standard.

Intelligent hull condition management

Through data-driven tools, Jotun help optimize vessel efficiency by analyzing key performance data according to ISO 19030. This helps identify improvement areas and minimize fouling, which in turn will reduce fuel consumption. Included for users of HPS 2.0 is the performance analysis service in Jotun's well-known HullKeeper platform, to synergize intelligence on hull condition with hull performance analysis, enabling operators to make better and faster decision through actionable insights.

Jotun's dock-to-dock guarantee ensures continuous performance from one dry docking to the next, maintaining consistent hull efficiency throughout. The guarantees protect against will ensure peace of mind for operators and is a testament to the proven and promised performance that HPS 2.0 is delivering.

With nearly 100 years of experience navigating unknown waters, Jotun remains committed to innovating and developing advanced products and solutions that cut carbon emissions, preserve fuel and protect biodiversity.

“In 2011, we revolutionized the industry with our groundbreaking HPS, moving from promised to proven performance. As the true home of hull performance, we are proud that the industry has jumped on board with this solution and consider hull performance as a core element of vessel efficiency. By introducing HPS 2.0, we will continue our legacy and build on our proven performance and move forward with an even more comprehensive solution tailored to our customers' specific trade requirements,” said Morten Sten Johansen.



Data driven tools help Jotun to identify improvement areas and minimize fouling, which in turn will reduce fuel consumption.



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Engineered for the Indian market; exported to the world

VR Coatings Pvt Ltd, design pumps and systems tailored to specific customer needs while ensuring economic viability

VR Coatings Pvt Ltd, is a well-known manufacturer, supplier and exporter of a large assortment of spray and dispensing equipment. They offer a complete spectrum of fluid handling equipment, engineered for dispensing, spraying, transferring, dosing, proportioning, mixing, and coating a wide range of materials – liquids, semi-solids, and high-viscosity compounds.

“We specialize in equipment for high-viscosity spraying and dispensing, including sealants, adhesives, greases, waxes, and other complex materials,” said Mr Desmond Colaco, General Manager – Marketing, VR Coatings Pvt Ltd. “At the same time, we also provide systems that

handle low to medium viscosity fluids such as paints, solvents, inks, and oils with equal efficiency.”

Their product suite includes:

- Spray painting equipment
- Semi-solid dispensing systems
- Servo driven based dispensing systems
- Automatic robot / reciprocator based systems
- Remote / automotive based spray painting equipment
- Precision dosing solutions that handle micro-quantities starting from 0.001 grams

These systems are tailored for both volume-based and time-based dispensing, offering

exact control in critical production environments where accuracy and consistency are non-negotiable.

As for the markets, VR Coatings Pvt Ltd's solutions are trusted across an extensive range of sectors, including but not limited to:

- Automotive and auto ancillary
- Aerospace, railways, naval and shipbuilding
- Construction, infrastructure, and heavy engineering
- Appliances, furniture, and woodworking
- Electronics and electric potting equipment
- Drum and barrel manufacturing



Mr Desmond Colaco, General Manager – Marketing, VR Coatings Pvt Ltd.

PHOTOS: VR COATINGS PVT LTD.

- Pharmaceutical, food, cosmetics, and packaging
 - Public works, metallurgy, and chemical processing
 - Adhesives, sealants, solvents, inks, and coating applications
 - Laboratories, R&D centers, and specialized isolation applications
- “Essentially, if the fluid is sprayable or dispensable within defined boundary conditions, we have the equipment and engineering depth to handle it precisely and reliably,” said Mr Colaco.

Standout innovations

Among their standout innovations are:

- The CHEETAH and Hot CHEETAH series of pumps – renowned for their high delivery at high pressures, with the Hot CHEETAH specifically engineered for temperature-sensitive or high-viscosity fluids. These units have become the benchmark



VR Coatings' production units are well-equipped and loaded with high-end machines for making products in tune with the industrial standards and the prevalent market trends.

BYK Additives

Protection with high impact

Hot summers, heavy rain, and cold winters make long-lasting corrosion protection challenging. As infrastructure projects increase and the demand for sustainable solutions grows, high-filled and high-built coating systems are crucial. BYK's additive building blocks – featuring wetting and dispersing additives to reduce mill base viscosity, rheology additives to adjust sag resistance, and defoamers to prevent imperfections – ensure flawless corrosion protection even under challenging conditions.

[byk.com](https://www.byk.com)



Left to right: VR Coatings' Polyurea Waterproofing Machine; the Electrical Airless Spray Pump; and the Heavy Duty Airless Spray Pump.

in high-demand industrial environments.

□ Their PFP Series, especially the PFP Spray Machines, are engineered for intermittent and precision coatings. These are highly appreciated for their accuracy, durability, and consistent spray performance across various industries.

Both product families are designed for maximum uptime and minimal maintenance, making them excellent investments for long-term operational efficiency.

“The uniqueness of VR Coatings lies in our core

philosophy – we are proudly 'Make in India' brand, engineered for the Indian market, and exported to the world. Our systems are designed to withstand the demanding environmental and industrial conditions prevalent in India, yet we manufacture them to global standards. This is why we are able to confidently serve international markets as well,” said Mr Colaco. “As strong advocates of Make in India, we believe that supporting Indian-made products empowers not only large-scale projects, but also helps small industries grow, innovate and compete

globally. With proven reliability, cost-effectiveness, and world-class engineering, we continue to promote Indian manufacturing excellence both at home and abroad.”

Their core strengths include:

- Ease of maintenance
- Low operating and maintenance costs
- Wide availability of spares and service support – across India and globally
- Modular, customizable design for system integration

“All of this makes our offerings not only reliable and efficient but also cost-effective and scalable for future upgrades,” said Mr Colaco.

“One of the most exciting advancements at VR Coatings is the launch of our IoT-integrated servo dosing and dispensing systems, which now include features such as predictive maintenance, remote performance diagnostics, and seamless integration with automated production lines.”

“We’ve also entered the micro-dispensing segment, offering dispensing accuracy from as low as 0.001 grams – ideal for potting, sealing, and

coating in electronics, medical devices, and laboratory-grade applications,” said Mr Colaco.

Through strategic partnerships, they have introduced vacuum-assisted dispensing systems for advanced applications, and their new electric pump – quiet, clean, and energy-efficient – is another major leap forward. “This range not only reflects our technological progress but also our dedication to meet evolving customer needs at a global standard,” said Mr Colaco.

Global sales and service

“We are proud to say that VR Coatings is the only Indian manufacturer at the scale with such a broad and specialized portfolio of fluid handling equipment, supported by global sales and service infrastructure,” said Mr Colaco.

“What truly sets us apart is our deep application knowledge. We do not merely sell off-the-shelf equipment – we design pumps and systems tailored to specific customer requirements while ensuring economic viability.”

Customer training and education

In addition, their products are backed by industry-leading support, easy serviceability, and customer training programs, making their solutions both practical and forward-thinking.

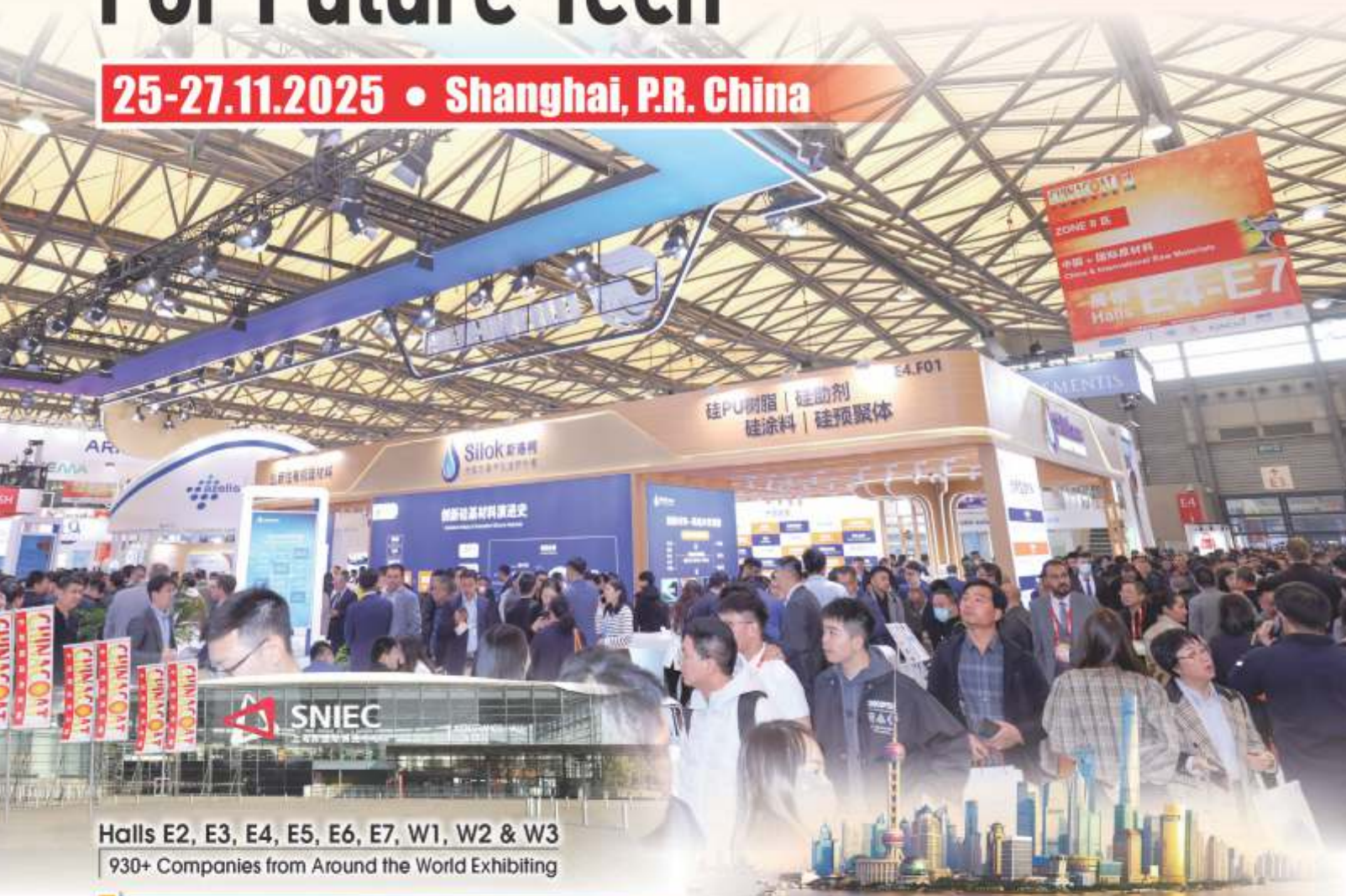
“Training and education are at the heart of our customer engagement model. We conduct regular training sessions, both online and in-person, to ensure that operators and maintenance personnel are confident in using our systems,” said Mr Colaco.



The PFP series spray machines are engineered for intermittent and precision coatings; these are highly appreciated for their accuracy, durability and consistent spray performance across various industries.

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TIANMAX
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W3.E21

W2.A13



The warehousing is spacious and systematic; a dedicated quality control unit checks the quality of manufactured goods and raw materials.

“We also collaborate closely with paint, sealant, and adhesive manufacturers, aligning our technologies with their materials and processes. These collaborations allow us to co-develop application solutions that are tested, validated, and optimized for real-world use,” said Mr Colaco.

“Our goal is not only to sell a machine, but to partner with our customers in achieving operational excellence.”

Clear mission

VR Coatings was founded in 1985 with a clear mission: to offer reliable and innovative fluid handling solutions made in India. We began as a modest operation in Pune and, over the years, have evolved into a recognized name with two manufacturing sites in Pune, an expanding facility in Wai, and an assembly unit in Karlsruhe, Germany, to support their European clients.

The production units are well equipped and loaded with high end machines for making products in tune with the industrial standards and the prevalent market trends. The warehousing is spacious and systematic. A dedicated quality control unit checks the quality of manufactured goods and raw materials. The

packaging system makes use of innovative techniques for keeping goods safe from damage during transportation and is known for making delivery within the stipulated time period. Overall, their professionals have helped VR Coatings operate as a client-centered organization and offer customized products at cost effective prices with clientele from all across the globe.

“Our growth has been organic, sustained by engineering integrity, customer trust, and a commitment to innovation,” said Mr Colaco.

“Looking ahead, we are preparing for a public offering (IPO) that will support our ambitions in R&D, automation, and global expansion. In ten years, we envision ourselves as a global leader in customized fluid handling solutions, known for quality, innovation, and integrity.”

“The industry is in a transformative phase. On the one hand, user industries are seeking higher precision, energy efficiency, and digital connectivity. On the other, manufacturers like us must rise to the challenge of delivering smarter, more flexible systems that can adapt to increasingly complex processes.”

“From both perspectives, there is substantial growth ahead – especially in areas like EV battery manufacturing, smart coatings, construction chemicals, and microelectronics. We are optimistic about the role we can play in shaping this evolution.”

Awards and accolades

Along the way, VR Coatings has earned recognitions and honoured with performance and innovation awards from industry partners, OEMs, and trade associations over the years.

VR Coatings hold the following key certifications:

- ISO 9001 for quality management
- CE Certification for compliance with European standards
- ATEX Certification (EXII 2G c T4) for equipment used in explosive atmospheres

Amongst their customers, they can boast of some of the most prestigious and respected organizations across various sectors, including the Indian Navy, the Currency Note Press, Mercedes-Benz, Tata Motors, Mahindra & Mahindra, Indian Railways, and many, many more.

“We have supplied numerous

pumps to M Pallonji for shipyard painting and our machines for painting the prestigious INS Vikrant. Our expertise extends globally, with a strong presence in the Middle East with clients like ARAMCO and ADNOC, where we have delivered a wide range of pumps and machinery for spraying and dispensing applications,” said Mr Colaco.

These stories are more than milestones – they are a reflection of the trust our customers place in us, and the values we stand for.

“One story that stands out is when a major multinational automotive manufacturer, after rigorous evaluation, replaced their expensive European systems with our equipment in multiple plants. The reason? Our equipment outperformed their existing systems in efficiency, reliability, and service support – all at a fraction of the cost,” said Mr Colaco.

“Another cherished moment was when we developed a specialized system for a sealant application in the shipbuilding sector within 30 days, meeting a time-sensitive project deadline. The system continues to run flawlessly even today,” concluded Mr Colaco.



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FROSIO is a member organisation established in 1986 by the industry to meet a growing demand of qualified and certified personnel on all levels within management, production and inspection of work within corrosion protection and surface treatment. FROSIO acts through formulation of quality requirements for surface treatment and coating inspectors.

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Bio-based innovations reshaping paint and coatings industry

Dr Sangeeta Srivastava, Executive Director, Godavari Biorefineries Ltd in a chat with C&ACER

Godavari Biorefineries Ltd has been a pioneer in the field of renewable chemicals in India. Their products serve critical industries including food, fragrance, pharmaceuticals, coatings, and personal care. With decades of experience and a customer base spanning more than 20 countries, they bring together scale, science, and a strong commitment to sustainability, Dr Sangeeta Srivastava, Executive Director, Godavari Biorefineries Ltd in a chat with C&ACER.

What are the main sustainability challenges in the paint and coatings industry?

Sustainability in the paint and coatings sector is a deeply rooted challenge that starts at the molecular level. Most raw materials are still derived from

fossil-based sources, which are neither renewable nor climate-resilient. Shifting to greener alternatives is not just about product substitution. It demands a reliable and scalable supply chain that can deliver both consistency and quality. Add to this the environmental load of manufacturing itself, including high energy consumption, water use, and emissions, and the complexity only increases. There is also a considerable awareness gap. Many end-users are still unaware of how their coating choices impact the environment over the product lifecycle. These are not short-term operational hurdles. They are long-term structural challenges that the industry must address with seriousness and speed.

How does Godavari Biorefineries Ltd contribute to the sustainable transformation of the paint and coatings industry?

At Godavari Biorefineries, sustainability is not an initiative. It is a way of doing business. We develop renewable, plant-based chemicals that act as solvents and intermediates for paints and coatings. These are not alternative products in the experimental stage. They are high-performing, commercially available, and ready for integration. What sets them apart is their ability to match the performance of traditional materials while reducing environmental impact. This is not just about changing ingredients. It is about transforming the chemistry behind coatings to align with a more sustainable future.



Dr Sangeeta Srivastava, Executive Director, Godavari Biorefineries Ltd.

during production, and reduce energy consumption. This means they directly contribute to environmental conservation. Sustainability is no longer just about adhering to standards. It is about taking responsibility for how our products shape the world around us.

What are some key strategies for promoting sustainability in paints and coatings?

There are four clear focus areas. First, raw materials must be sustainable. Without this foundation, the final product cannot be environmentally sound. Second, production processes need to become more efficient. That includes managing energy, water, and emissions more effectively. Third, the entire supply chain must be aligned with sustainability goals. A green product manufactured using unsustainable methods elsewhere loses credibility. Fourth, there must be a push for consumer awareness. Customers should know why their coating choices matter.



Godavari Biorefineries Ltd runs one of India's most integrated biorefineries with their products serving critical industries including coatings, food, fragrance, pharmaceuticals and personal care.

There is a lot of talk on sustainability. Why is it so important, especially with reference to the paint and coatings industry?

Paints and coatings are used across industries and infrastructure. They affect how long a structure lasts, how often it needs maintenance, and when it must be replaced. Sustainable coatings can extend durability, lower emissions

PHOTOS: GODAVARI BIOREFINERIES LTD.



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BL-600	BL-600 E	785	100-125 HP
BL-1000	BL-1000 E	1569	150-200 HP
BL-1600	BL-1600 E	2300	225-350 HP

Enquiry Now



This turns a technical purchase into an informed environmental decision.

Can you share some insights on how innovative bio-based solutions are reshaping the future of the paint and coatings industry?

Bio-based innovation is redefining possibilities. At Godavari Biorefineries, we have developed sugarcane-derived solvents that go beyond simply replacing fossil-based ingredients. These materials introduce safer handling, improved compatibility, and expanded formulation options. The benefits are measurable. Manufacturers can meet stricter environmental regulations while maintaining high performance and reducing dependency on petroleum-based markets. This is not just future potential. It is already in practice. Companies embracing these solutions early will build more

resilient and adaptable businesses.

What are the Godavari Biorefineries Ltd range of products that help in sustainability?

Our offerings include renewable solvents, specialty chemicals, and intermediates, all produced from sugarcane feedstocks. These products are used widely across sectors, with strong applications in the paint and coatings industry. Their advantages are not limited to being bio-based. They also deliver on performance, scale, and compatibility with current manufacturing systems. More importantly, they help lower the carbon footprint of the entire value chain. These are not lab-scale ideas. They are commercially viable solutions, backed by consistent quality and responsible sourcing.

How can consumers contribute to a more



Godavari Biorefineries Ltd, develops renewable, plant-based chemicals that act as solvents and intermediates for paints and coatings.

sustainable paint and coatings industry?

Consumers play a powerful role in accelerating change. Every choice at the point of purchase sends a message. When buyers select low-VOC paints or those made with renewable and certified ingredients, they are not just opting for better products. They are creating demand that drives the industry

forward. Asking the right questions, reading the labels, and supporting responsible manufacturers are small actions with large impacts. Informed consumers make sustainable innovation a market expectation rather than a niche trend.

A brief about the activities of Godavari Biorefineries Ltd...

Godavari Biorefineries Ltd is a part of the Somaiya Group and has been a pioneer in the field of renewable chemicals in India. Our head office is located in Mumbai, and our core manufacturing operations are based in Sameerwadi, Karnataka and Sakharwadi, Maharashtra. We run one of India's most integrated biorefineries, producing bio-ethanol, renewable power, and a diverse range of sugarcane-based chemicals. Our products serve critical industries including food, fragrance, pharmaceuticals, coatings, and personal care. With decades of experience and a customer base spanning more than 20 countries, we bring together scale, science, and a strong commitment to sustainability.

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**COATINGS AND
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ENGINEERING REVIEW**



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NABL ACCREDITED LAB



Prof. A. S. Khanna
Director

As per the new requirements all labs under NABL, must have a Registered Entity. As a result SECC a proprietorship company needed to be changed to a Pvt. Ltd. company. With effect from New Financial Year starting from April 1, 2024, SECC is renamed as Khanna Paint Testing Laboratory (OPC) Pvt. Ltd. We have now 54 different paint standards approved by NABL. These 54 standards include IS, ASTM, DIN, ISO, NACE, and AWWA standards. Details can be see on our website which is now www.kptllab.com The lab has the most modern, fully calibrated equipment with well-educated and trained staff.



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Striving for a corrosion-free India

While a completely 'Corrosion-free India' is likely an aspirational goal, significant strides are being made through various measures, including research, awareness campaigns, and the adoption of corrosion-resistant materials and technologies

"India loses over Rs 12 lakh crore every year to corrosion-related damage. This is equivalent to nearly 4.2 percent of the country's GDP," said Dr U. Kamachi Mudali, AMPP India Area Representative and Vice Chancellor of Homi Bhabha National Institute, Mumbai. "With nearly 90 percent of industries depending on steel, and 25 – 33 percent of it lost to rust, surface engineering must be treated as a national priority!"

"Surface protection is not just about preserving materials, it is about reducing carbon emissions, increasing lifecycle efficiency, and contributing to India's sustainability goals. Every ton of steel lost to rust adds to our carbon burden. Surface technology must evolve in sync with India's ambition to become a manufacturing powerhouse," he emphasized. He was

speaking, along with the others, at the CII Surface & Coating Expo 2025 held in Chennai recently.

The per capita consumption of paint in India is relatively low compared to global averages, standing at approximately 4.1 kg. This figure may look significantly lower than the global average of 13 - 15 kg, but highlights the significant growth potential for the Indian paint industry as the country's infrastructure and economy continue to develop. Factors like urbanization, increasing disposable incomes, and a growing housing market are expected to drive increased paint consumption in the coming years.

Mr Abhyuday Jindal, managing director, Jindal Stainless, said: "Corrosion remains a significant challenge to India's industrial growth, resulting in



Efforts and initiatives aimed at combating corrosion and its detrimental effects on infrastructure and industries in India are being undertaken by various organizations.

considerable economic losses and undermining public safety." He further added their focus lies in delivering corrosion-resistant stainless steel solutions across diverse applications while working collaboratively with industry leaders, academia and policymakers to develop long-term strategies for corrosion control and infrastructure resilience. "Jindal Stainless remains committed to driving innovation, raising awareness, and promoting sustainable corrosion management practices to help build a corrosion-free nation," he said.

While a completely 'Corrosion-free India' is likely an aspirational goal, significant strides are being made through various measures, including research, awareness campaigns, and the adoption of corrosion-resistant materials and

technologies. To this effect, efforts and initiatives aimed at combating corrosion and its detrimental effects on infrastructure and industries in India are being undertaken by various organizations like the Association for Materials Protection and Performance (AMPP) India Chapter, the National Corrosion Council of India, Indian Institute of Metals, and the Confederation of Indian Industry (CII) through various platforms and forums.

Corrosion is a major economic drain, costing India billions of dollars annually. It weakens structures, reduces the lifespan of equipment, and necessitates frequent repairs and replacements. Corrosion can lead to structural failures, posing safety risks in various sectors. Corrosion can also contribute to pollution and environmental damage.

Understanding the significance of corrosion as a global menace CII had launched the



Every ton of steel lost to rust adds to our carbon burden.

National Mission on “War Against Corrosion” with support of Government of India's National Think Tank, NITI Aayog. As per the mission objective CII - Corrosion Management Division (CMD) will work as a nodal agency to promote corrosion management practices across sectors in the country. It is estimated that 25 - 30% of corrosion could be prevented by following these measures and the life of equipment can be extended up to 250%. The CII National Mission on Corrosion Management will work on following goals:

Goal 1: To develop national policies and procedures in discussion with all stakeholders including NITI AAYOG and other concerned Government departments which helps mitigate economic losses & spur nation builders.

Goal 2: To facilitate the provision of corrosion expertise to governments, industries, and communities.

Goal 3: To prepare and make available corrosion-related standards/regulations etc.

Goal 4: To raise public

awareness of corrosion and its mitigation.

Goal 5: To identify/develop best practices in corrosion management.

Goal 6: Promote the use of anti-corrosion solutions, products, and technology.

The CII is also actively working with the Indian government to develop a national policy on corrosion management. The mission focuses on policy development, expertise provision, standardization, awareness campaigns, and promoting best practices in corrosion management.

Bringing down corrosion

India is projected to become the world's third-largest economy by 2028, according to a report by Morgan Stanley. This projection is based on India's strong economic growth, which is expected to continue, with its GDP potentially doubling to \$10.6 trillion by 2035.

India's population is currently estimated at 1.46 billion, making it the world's most populous country. Approximately 47% of India's population is under the age of

25. A young population offers several advantages, primarily related to economic growth, workforce development, and potential for innovation. These include a larger and potentially more productive workforce, increased domestic markets, and a greater capacity for technological adoption and adaptation.

There has to be a concerted effort if we have to be anywhere near a Corrosion-free India. We may not be able to eradicate corrosion all of a sudden, but it can be done gradually, suggested Dr Kamachi Mudali. “The cost of corrosion is around 2.1 percent of the GDP in the USA, and in Japan, it is around 1 percent. So, India with 4.2 percent is losing quite a lot of money! Say 21 years down the line from today in 2047, if we are able to halve rate of corrosion gradually from the present 4.2 percent to 2.1 percent, it would be a great achievement. This can be achieved if we make an effort to reduce the cost of corrosion by 0.1 percent every year. The savings are huge! If we look at our Rs 3.1 trillion GDP today, 0.1 percent of that is a whopping Rs 30,100 crore. But by 2047, the GDP is not going to be Rs 3.1 trillion, but according to the Government, we should be a Rs 30 trillion economy then. So, if we do not bring down the corrosion rate, we are talking of a Rs 12.6 lakh crore loss. On the other hand if we are not serious, it may go from the present 4.2 percent to even 6.2 percent the next 20 years!”

Workforce development

“But to have a Corrosion-free India, the first point I would

make is a thrust on education and training,” said Dr Kamachi Mudali. “The ill-effects of corrosion should be taught right from school. Nowhere are we taught either in school or college how metal degrades and how components fail and how we can arrest this so that they last their full intended life. For this education has to be at the forefront, followed by proper training. This is one of the fundamental weaknesses in our education system. We do not teach practical things that are useful for the nation. The younger generation must be ingrained with knowledge about the menace of corrosion. Today, I think IIT Bombay is the only institute where a subject like technology in corrosion science and engineering is taught. No other institution either in the undergraduate, postgraduate or PhD level has a direct program on corrosion.”

There are efforts by organizations such as CII which started a corrosion manager's course in the year 2007. So far, they have held nearly 50 such courses and 5,000 personnel from the industry have made good use of this program.

The Indian Institute of Technology Ropar in collaboration with the CII Corrosion Management Division offers an Online Postgraduate Professional Development Program in Corrosion Management and Technology.

Other organizations like the Blastline Institute provide training programs in painting inspection in collaboration with internationally well-known organizations like BGAS, and AMPP.

AMPP, a world leader in



Corrosion can lead to structural failures, posing safety risks in various sectors.

standards and training also offers a wide range of professional courses like the Coating Inspector Programs, Cathodic Protection, Applicator Certifications and many others. “It is important that we develop a model that is fine tuned to Indian conditions and needs. This would help in more people getting trained who would be useful for the Indian community and industry.”

Workforce development is not a subject of importance not only for India, especially with all the infrastructure development happening all around, it is a global concern. “There is always a shortage for a skilled workforce, and we need to tackle this challenge, by equipping a workforce that will work towards combating challenges related to corrosion,” said Amir Eliezer, Immediate Past Chair of the AMPP Board of Directors.

“After all, India is a leader contributing to the global workforce development. Some of the statistics we have zoomed in show that 40 percent of the workforce working in the Gulf Cooperation Council (GCC) region comes more or less from India. So, it is really very important that we do come back to India and equip the people in India. It is an amazing opportunity with the workforce which you have in India to train that workforce and realize the aspirations they have. We are excited about the development opportunities here in India and think what an impact we could have on the world from a global standpoint by really having a workforce that can work globally to end corrosion.”



Workforce development is a subject of concern not only for India, especially with all the infrastructure development happening all around, it is a global concern.

This can also work the other way around. The Indian workforce having been exposed to best practices around the world can bring that knowledge back to India and spread that knowledge around to work towards a better development of the country.

Artificial Intelligence and Machine Learning

Technology adoption is another important factor in the fight against corrosion. So many new technologies and superior products are being developed and introduced. Artificial Intelligence (AI) is one subject that is much discussed today. People say, “With AI we will solve everything.” AI has a huge potential in corrosion management.

AI and Machine Learning (ML) are transforming corrosion management by enabling more accurate, efficient and proactive monitoring and control. AI-powered systems can analyze vast amounts of data from various sources, predict corrosion behavior, and facilitate timely maintenance and repair decisions,

minimizing risks and costs.

Here are some of the ways how AI is impacting corrosion management:

AI algorithms can analyze data from IoT sensors, cameras, and other sources to detect corrosion in real-time, providing early warnings and enabling prompt action. Machine learning models can be trained on historical data and real-time information to predict future corrosion rates and patterns, allowing for proactive maintenance.

Computer vision powered by AI can analyze images and videos to identify even subtle signs of corrosion, especially in hard-to-reach areas. AI can automate the inspection process, using drones and robots to collect data and identify corrosion, reducing the need for manual inspections.

By analyzing corrosion data and predicting future trends, AI can help optimize maintenance schedules, ensuring that maintenance is performed when and where it is most needed.

AI-driven corrosion management can lead to significant

cost savings by reducing the need for reactive repairs, minimizing downtime, and extending the lifespan of assets. AI can identify anomalies in corrosion-related data, signaling potential issues before they escalate into major problems.

By enabling proactive maintenance and timely repairs, AI can help prevent catastrophic failures caused by corrosion, enhancing the safety of operations.

AI provides decision support systems that leverage data analysis to guide corrosion management decisions, including recommending optimal maintenance strategies and assessing the cost-effectiveness of different approaches.

“So, AI has the opportunity to bring data to the fingertips of those who need it and at the precise moment they need it, or in the role where they need to apply that information,” said Dr Eliezer. “And, if we can get to a point where the information can be validated, that it is authorized information, i.e. the data is being

used is coming from an academic research or is it referencing it to a paper presented at a conference.”

“Today, there is AI all around. There is AI in automation, in mobility, in areas like drone inspection. I see it as an opportunity for the growing workforce in a place like India. I don't see AI replacing workers. I see it as complementary to the problem that we don't have enough workforces to address the issue.”

Materials transition

“Materials transition is a new terminology you are going to hear about again and again,” said Dr Eliezer. “People are thinking about and innovating new materials that can be used in all the infrastructure development all over the place. This is driven by the agenda of sustainability and reducing the carbon footprint of the materials we are using.”

Materials transition and corrosion are interconnected concepts, particularly when discussing the durability and lifespan of materials, especially metals. Materials transition refers to the movement towards using new materials or modifying

existing ones to achieve specific goals like improved performance, sustainability, or cost-effectiveness. Corrosion, on the other hand, is the degradation of materials, most commonly metals, through chemical or electrochemical reactions with their environment.

The need to develop more corrosion-resistant materials is a major driver for materials transition, especially in industries like aerospace, energy, and infrastructure. Choosing the right materials with inherent corrosion resistance or applying protective coatings is crucial for both the long-term performance of structures and the success of materials transitions. Emerging 2D materials like MXenes and layered double hydroxides offer promising solutions for corrosion protection due to their unique properties and ability to form protective films.

High-temperature corrosion is a significant challenge in many industries, and materials transition efforts are focused on developing alloys and coatings that can withstand these harsh conditions.

In essence, materials



Drones help in inspection, particularly in difficult-to-reach areas.

transition and corrosion are intertwined concepts. As industries seek to develop more sustainable, high-performance materials, understanding and addressing corrosion is paramount. This requires a combination of materials science, engineering, and a focus on developing innovative solutions for corrosion prevention and mitigation.

Technological advances

“When we see rust, we recognize it as corrosion,” said Dr Eliezer. “So, the first thing that would come to your mind would be 'ok, let's paint it!' Or if you are designing from the beginning you would probably say, 'let's apply something to protect it! But there are a lot of technological advances that are happening. One example is nano technology, something you may not hear about much. But this is one of the technologies that have come across to advance the material characteristics for it to combat corrosion and give the asset a longer life.”

“According to statistics, 70 percent of the failure in coating systems does not come from the material, it happens due to improper

application. There are lot of advancements in the way we do the application. They are adopting robotic application methods that will help have a consistent and standardized application which will help reduce failures. After application comes the inspection. There are lot of developments in this field too. AI, robotic, or drones help in inspection particularly in difficult to inspect areas to be done in the right way and guarantee the quality of the coating system as a whole when it is applied.”

“A workforce that is not aware of these developments would still use the same old way of mixing and applying the product without being trained or educated in the way this coating works,” said Cindy O, Malley, Chief Operating Officer, AMPP. “So, it has to be a continuous cycle and we have to work hard to make sure that the on-going development and upskilling is happening in real time; that the workforce that is being developed – both the professional and the upcoming student workforce – is extremely prepared for the challenges ahead!”



Robotic application methods help have a consistent and standardized output, which helps reduce failures.

Corrosion concerns in vehicle exports from India: Causes, risks and solutions

Dr Prakul Rakesh explores the causes, risk factors, and preventive measures for corrosion in vehicles being exported from India

Introduction

India has rapidly emerged as a major hub for automobile exports, with Indian-made vehicles reaching markets across Africa, Southeast Asia, the Middle East, and Latin America. In FY 2023 (ended March 2024), India exported 672,105 passenger vehicles, which represented about 13% of its domestic production.¹ In FY 2024–25, exports surged to 755,000–765,000 units, a 12–14% rise from FY24.

The rising trend of vehicle export shows clear market in future, however, one persistent challenge for exporters is corrosion – the silent enemy that can damage the vehicle's structural integrity and aesthetics during transit. This feature explores the causes, risk factors, and preventive measures for corrosion in vehicles being exported from India.

Why corrosion occurs during export

Corrosion is a natural electrochemical reaction where metal reacts with moisture, oxygen, and salts, leading to rust formation.

During export, the conditions are highly conducive for corrosion due to:

1. High humidity in coastal ports

Most Indian ports (e.g., Mumbai, Chennai, Kochi, Vizag) are located in humid, salty coastal areas. Vehicles stored in open yards for even a few days may begin to show signs of corrosion.

2. Long transit times

Shipping to distant markets (such as South America or Africa) may take 2–6 weeks, during which vehicles are exposed to:

- Salt-laden sea air



PHOTOS: DR PRAKUL RAKESH

Vehicles stored in open yards for even a few days may begin to show signs of corrosion.

- Condensation in containers or ship decks
- Fluctuating temperatures

3. Poor packaging or protective measures

Vehicles exported without adequate protection (e.g., shrink wrapping, rust inhibitors, or VCI) are more vulnerable to surface oxidation, especially on exposed parts like:

- Brake discs
- Undercarriage and suspension
- Wheel hubs
- Fasteners and battery terminals

High-risk parts for corrosion in vehicles:

- Brake rotors & discs – often begin rusting even in storage
- Undercarriage – exposed to salt spray and moisture
- Electrical contacts – battery terminals and

- fuse boxes
- Metal trim/emblems – cosmetic degradation
- Engine bay components – especially aluminum parts in contact with dissimilar metals

Consequences of corrosion for exporters:

- Customer rejection or warranty claims
- Brand damage in new markets
- Rework and refurbishing costs at destination
- Reduced shelf life or roadworthiness of the vehicle

Best practices to prevent corrosion in exported vehicles:

1. Use of anti-corrosion coatings

- Apply protective coatings like:
- Wax-based underbody coatings
 - Zinc-rich primer paints
 - Transparent anti-rust sprays on metallic parts

2. Vapor Corrosion Inhibitor (VCI) technology



The rising trend of vehicle export shows clear market in future, however, one persistent challenge for exporters is corrosion.

- Use VCI covers or films for packaging.
 - Place VCI emitters in the engine bay, cabin, and boot.
3. *Shrink wrapping and moisture barrier bags*
- Full vehicle wrapping with UV-resistant plastic reduces exposure.
- Use desiccant bags inside containers to reduce condensation.
4. *Shipping in enclosed containers (for premium vehicles)*
- Protects from salt-laden air and reduces external contamination.
5. *Regular port inspection and storage under covers*
- Ensure vehicles are stored in covered port sheds or under temporary tents.
 - Weekly inspection for early signs of corrosion helps proactive treatment.

Indian standards & global expectations

Indian exporters must ensure corrosion prevention practices meet:

- IS 13515 (Indian Standard for corrosion preventive compounds)
- OEM export standards (e.g., Hyundai, Suzuki, Tata Motors all specify corrosion protection protocols)
- International Maritime Organization (IMO) guidelines for vehicle shipping

Anti rust solution from the transit corrosion:

Anti corrosion coating is one of the cost effective and durable solutions among others. The use of protective coatings will not only protect the vehicle during shipping but it also increases the life of the vehicle's usage.

How Nanocot helps the OEM for vehicle exports?

InnMats Pvt Ltd offers Nanocot as an anti-corrosion clear coating. Nanocot is an advanced hybrid resin system, blend with polyurethane, polyurea, polysilane and nano-particles. They are successfully applying Nanocot technology on the vehicles of one of the largest defence vehicle manufacturer from India. Nanocot 2K Matte was applied on the entire body, including rust prone locations (as observed by customer team). After long term field/pilot tests and validation of Nanocot 2K showed no deterioration in extremely harsh shipping conditions, leading to extreme customer satisfaction of customer.

Nanocot system was able to completely remove the challenges faced and

provided durable protection with Salt Spray Test of 2000 hours (ASTM B 117), QUV resistance of 2000 hours (ASTM D 4587) and Weatherometer test of 4000 hours (ASTM G115) to the vehicles. Nanocot 2K coating system also enabled TASL team to provided a 5-year warranty on the complete paint system to the foreign clients.^{2,3}

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Stormer (Krebs), Cone Plate, Rotoviscometer	25 to 6000 cP
Coating Thickness DFT Gauge	10 µm to 5500 µm
Ultrasonic Thickness Gauge (Metal / Plastic)	5 mm to 100 mm
Analytical/ Precision Weighing Balance	0.1 mg to 220 g & 0.01g to 4000 g
Glossmeter (20/60/85 / Flex / Haze / DOI)	0 to 2000 GU
Oven / Bact. Incubator	45 °C to 200 °C
Water / Oil Bath	45 °C to 200 °C
Autoclave	45 °C to 200 °C
Furnace	300 °C to 1000 °C
Shear Test Oven	Upto 200°C
Humidity / Stability / Environmental Chamber	20 %rh to 95 %rh @25 °C
Condensation	45°C to 72°C
Q-FOG (Controlled Relative Humidity)	45°C to 70°C & 20 %rh to 95 %rh

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Groundbreaking advances in offshore pipelay: Denso's Viscotaq™ Offshore Field Joint Coating System

The choice of Denso's Viscotaq™ has demonstrated that a cold-applied FJC system can be safe, efficient, robust, and effective while significantly reducing specialist equipment and manpower

In June 2024, a Malaysia-based oil and gas exploration and production company embarked on an ambitious offshore pipelay campaign aimed at developing three offshore gas fields in Southeast Asia. Executed by a renowned global Offshore Installation Contractor (OIC), the project entailed the construction of two new sour-rated carbon steel pipelines, including risers and subsea spools. These pipelines included an 18 km run of 254mm (10") diameter pipe and a 22 km run of 304.8mm (12") diameter pipe, both designed to operate at a temperature of 109° Celsius.

Project overview

For this challenging project, the team selected a state-of-the-art global offshore

installation DP3 pipelay barge capable of performing S-lay operations with up to 1,524mm diameter (60") pipelines. This campaign was the first time the offshore installation contractor used a cold applied field joint coating system, specifically the innovative Viscotaq™ Offshore Field Joint Coating (OFJC) system. For this project, the Viscotaq OFJC system was comprised of four layers: ViscoWrap™ XHT, Viscotaq™ PE Outerwrap, Denso™ Glass Outerwrap, and Denso Rockmesh™.

ViscoWrap XHT: is comprised



Product application training during the Product Qualification Test (PQT) stage.

PHOTOS: WINN & COALES (DENSO) LTD, UK

Key performance highlights from the use of the Denso Viscotaq™ Offshore Field Joint Coating System on this project include:

- ❑ Achieving a record 1,766 hours free of Lost Time Injury (LTI) during the FJC operation.
- ❑ Averaging 200 to 290 Field Joint Coating (FJC) joints per day for the 304.8mm and the 254mm diameter pipelines respectively with a peak of 305 joints per day.
- ❑ Production application time of less than 5 minutes per joint.
- ❑ One of the lowest industry repair rates of 0.28% and 0.07% for the 304.8mm and 254mm diameter pipelines respectively. Averaging 0.19% for the entire campaign versus the KPI of 5%.
- ❑ Realising further cost savings by eliminating the need for PU infill foam on concrete weight joints.

of a viscoelastic adhesive compound, reinforced with an HDPE mesh and backed with a PE film. It provides the corrosion protection layer of the Viscotaq OFJC system.

Viscotaq PE Outerwrap: is comprised of a polyethylene tape coated with an adhesive layer. It provides circumferential compression to the corrosion protection layer of the Viscotaq OFJC system.

Denso Glass Outerwrap: is comprised of a woven glass fabric, impregnated with a moisture-cured polyurethane resin. It provides mechanical protection to the Viscotaq OFJC system.

Denso Rockmesh: is comprised of an extruded polymer mesh. It provides sacrificial, additional mechanical protection to the Viscotaq OFJC system during pipeline construction.

Rigorous testing

The start of this successful campaign began in early 2023 with an extensive third-party testing phase. This testing was to confirm that the Viscotaq™ OFJC system met the requirements of the international standard ISO 21809-3; ultimately, it was deemed that the Viscotaq OFJC system successfully met all requirements of the standard, at a maximum service temperature of 115° Celsius. The Denso Glass Outerwrap also demonstrated outstanding abrasion resistance and excellent impact resistance.

Training and Product Qualification Tests (PQT) were conducted at one of the OIC's facilities in Kuantan, Malaysia. This demanding phase required a short total cycle



(Top row) Roller box test simulating the pipelay vessel's stinger operation, and further testing during the Pre-Production Test (PPT) stage.

(Left) A complete Field Joint Coating (FJC) application ready to be placed into the sea.



time including the time allowed for the Denso Glass Outerwrap to cure to a minimum of Shore D 40. The PQT phase concluded successfully, with the OIC's applicators demonstrating

their ability to apply the entire system in under 4 minutes with the Denso Glass Outerwrap achieving an average Shore D 45 hardness after a cure time of 5 minutes. The product application was

the PQT, the OIC required Roller Box Testing to be completed. The Viscotaq OFJC system was subjected to a 10-tonne load roller/stinger simulation. This testing was completed during

so user-friendly that after just two hours of training, the OIC's applicators were able to start applying the Viscotaq OFJC system independently.

In addition to

was awarded to Winn & Coales (Denso) Ltd in collaboration with Pluperfect Technology, Denso's local Malaysian partner, at the end of 2023. Denso promptly manufactured approximately 7,000 precut ViscoWrap XHT sheets (the inner layer of the Viscotaq OFJC system) – along with the other system components – within three weeks.

By June 2024, the installation team had completed the entire FJC work onboard the OIC's pipelay vessel, finishing three days ahead of schedule and realising savings of over one million USD. A summary of all key performance highlights achieved through the use of the Viscotaq OFJC system can be found in the highlighted box in this article.

Conclusion

This project has highlighted the advantages of the Denso Viscotaq OFJC system. This choice of system has demonstrated to both the client and the OIC that a cold-applied FJC system can be safe, efficient, robust, and effective while significantly reducing specialist equipment and manpower.

the Pre-Production Test (PPT) stages at the OIC's yard. The Viscotaq OFJC system met all requirements of the Roller Box and PPT.

Seamless project execution and project completion

The project



The completed Viscotaq Offshore Field Joint Coating (OFJC) system once deployed into the water.

How protective coatings save structures and surfaces

The global protective coatings market valued at US\$30.2 billion in 2024 is projected to reach US\$46.5 billion by 2033, expanding at a CAGR of 6.3% according to the Persistence Market Research

In today's world, protective coatings are silently at work – on bridges, buildings, pipelines, aircraft, ships, and even on your kitchen appliances. They play a crucial role in preserving the integrity, appearance, and longevity of materials exposed to environmental stressors. Essentially, a protective coating is a layer of material applied to a surface to prevent or mitigate corrosion, wear, and degradation caused by exposure to moisture, chemicals, UV radiation, or mechanical stress.

These coatings come in various forms – paints, powder coatings, varnishes, and films – each formulated for specific applications. Their purpose isn't merely aesthetic; while they may enhance the look of a structure or product, their real strength lies in their ability to prolong the life of the underlying material.

The global protective coatings market was valued at US\$30.2 billion in 2024 and is projected to reach US\$46.5 billion by 2033, expanding at a CAGR of 6.3% according to the Persistence Market Research. These coatings, primarily composed of epoxy, alkyd, acrylic, or polyurethane, are essential for preserving surfaces in industries like oil & gas, maritime, and construction.

Widely used in civil engineering for infrastructure protection, their demand is driven by increased machinery use, rising infrastructure investments, and the expansion of renewable energy facilities where durability under harsh conditions is vital.

Types of protective coatings and their applications

Protective coatings can be broadly categorized based on their composition and function. Common types include:

Epoxy coatings - Highly resistant to corrosion and chemicals, making them ideal for industrial applications and marine environments.

Polyurethane coatings - Valued for their flexibility and UV resistance, often used in automotive and aerospace industries.

Zinc-rich primers - Provide cathodic protection to steel structures by acting as a sacrificial layer.

Ceramic coatings - Known for heat resistance and durability, widely used in high-temperature applications like engines and turbines.

Each type is tailored to combat specific threats. For example, offshore oil rigs use heavy-duty epoxy systems that withstand saltwater corrosion, while pipelines might be coated with fusion-bonded epoxy (FBE) to resist



Newer coating technologies focus on eco-friendly formulations – low VOC paints, waterborne coatings, and bio-based resins that lessen environmental impact without compromising performance.

soil chemicals and abrasion.

The science behind the shield

The efficacy of a protective coating lies in its ability to form a continuous, impermeable barrier between the material and the external environment. Some coatings work by repelling moisture or chemicals, while others contain inhibitors that actively prevent corrosion. In certain advanced formulations, nanotechnology is used to enhance adhesion, self-healing properties, and resistance to microscopic wear.

Surface preparation is critical. A poorly prepped surface can lead to premature failure, regardless of how advanced the coating might be. Techniques like sandblasting, power washing, and chemical cleaning ensure optimal adhesion and performance.

Industries that rely on protective coatings

From aerospace to architecture, protective coatings are a backbone of modern infrastructure:

Oil & gas - Coatings protect pipelines, rigs, and storage tanks from corrosive chemicals and environmental extremes.

Marine - Ships and offshore platforms need coatings that resist saltwater, biofouling, and UV exposure.

Construction - Steel frameworks, bridges, and concrete surfaces are protected against rust, moisture, and pollution.

Automotive & aerospace - Coatings improve fuel efficiency, reduce maintenance costs, and enhance the appearance and lifespan of vehicles.

Even the food and pharma



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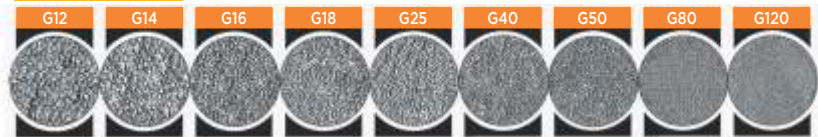


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ceutical industries rely on coatings to create sterile and easy-to-clean surfaces in production environments.

Economic and environmental benefits

While the upfront cost of protective coatings can seem high, the long-term savings are substantial. By preventing corrosion and degradation, coatings reduce the need for repairs, replacements, and downtime. For example, a well-coated bridge can function safely for decades without significant maintenance.

There's also an environmental upside. Preventing rust and decay reduces material waste and resource consumption. Newer coating technologies focus on eco-friendly formulations – low VOC (volatile organic compounds) paints, waterborne coatings, and bio-based resins that lessen environmental impact without compromising performance.

Innovations driving the future of protective coatings

The protective coatings industry is evolving rapidly,



Ships and offshore platforms need coatings that resist saltwater, biofouling, and UV exposure.

with advancements focusing on performance, sustainability, and smart functionality. Some key trends include:

Self-healing coatings - These use microcapsules or chemical reactions that activate when damaged, automatically sealing small cracks or scratches.

Anti-microbial coatings - Crucial in hospitals and food facilities, they inhibit the growth of bacteria and mold.

Smart coatings - Embedded with sensors or responsive elements, these coatings can change color in response to damage or environmental changes, acting as early

warning systems.

Research is also pushing the boundaries of sustainability, with developments in biodegradable coatings and those derived from natural polymers.

Challenges in the coating industry

Despite the many benefits, protective coatings face challenges. One is durability in extreme environments – like deep-sea or high-temperature settings. There's also the issue of compatibility between different layers (e.g., primer, topcoat) and the substrate. Misalignment can cause peeling, cracking, or bubbling.

Additionally, regulatory pressures are growing. Coating manufacturers must navigate increasingly stringent health, safety, and environmental regulations, which drive innovation but also increase development costs.

Maintenance and inspection: Keeping the coatings working

Application isn't a one-time solution. Maintenance and regular inspections are essential to ensure long-term

performance. Many industries use non-destructive testing methods – like ultrasound, X-ray, or infrared scanning – to check for hidden issues without damaging the coating or the material underneath.

Some facilities implement coating maintenance schedules aligned with predictive maintenance systems. This proactive approach helps address potential failures before they become serious, saving both money and lives.

Conclusion: More than just a pretty surface

Protective coatings may not always be visible, but they are an essential line of defense in almost every modern industry. They preserve structural integrity, reduce environmental impact, and offer significant economic benefits. As technology continues to advance, these coatings will only become more intelligent, durable, and sustainable.

Whether it's the sleek paint on a sports car or the invisible layer safeguarding an underwater pipeline, protective coatings is a testament to engineering innovation – and to our enduring effort to protect what we build.



Techniques like sandblasting, power washing, and chemical cleaning ensure optimal adhesion performance.

COATINGS AND ANTI CORROSION

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AkzoNobel elevates regional innovation with launch of R&D Centre in Malaysia

AkzoNobel has taken a bold step in reinforcing its long-term commitment to innovation and sustainability in the Southeast Asian region with the launch of its newest Research and Development (R&D) Centre in Nilai, Malaysia.

This facility is poised to become a cornerstone of the company's regional strategy, focused on driving sustainable innovation in decorative paints while delivering locally relevant solutions that meet the growing demands of Southeast Asian consumers.

Designed as a regional innovation hub, the Nilai R&D Centre brings AkzoNobel's expertise closer to key markets, enabling faster, more responsive product development that aligns with local climate conditions, consumer preferences, and regulatory standards.

"This new centre marks a significant step in our journey to transform the way we innovate in the region," said Nguyen My Lan, Business Unit Director for Decorative Paints, ASEAN. "It enables us to tap into local talent and insights, while connecting seamlessly with our global R&D network to deliver smarter, more sustainable solutions across the region."

The facility is part of AkzoNobel's global network of approximately 70 R&D laboratories and complements existing centres in the Netherlands, the United Kingdom, Dubai and Poland, among others.

With a team of 35 R&D

professionals, the Nilai Centre is equipped with state-of-the-art laboratories, advanced analytical tools, and a fully automated robotic testing system that supports high-throughput experimentation.

This setup allows AkzoNobel to optimise paint formulations faster and more efficiently, accelerating the journey from

research to market. "To me, sustainable innovation means creating paints that reduce environmental impact across their lifecycle, without compromising on performance or design," My Lan explained.

The centre focuses on low-VOC (Volatile Organic Compounds) technologies, bio-based materials, and circular design principles. These approaches not only meet consumer demands for eco-friendly products but also align with the company's broader sustainability goals.

The facility itself embodies AkzoNobel's sustainability ethos, featuring energy-efficient systems and the use of environmentally responsible construction materials. The integration of the robotic testing system further underscores this commitment by reducing waste, improving precision, and minimising energy consumption in the development process.

Malaysia was strategically chosen for this R&D Centre



Designed as a regional innovation hub, the Nilai R&D Centre brings AkzoNobel's expertise closer to key markets, enabling faster, more responsive product development that aligns with local climate conditions, consumer preferences, and regulatory standards.

due to its strong talent pool, robust infrastructure, and its position as a gateway to the broader Southeast Asian region. Government support, particularly from InvestKL – the lead investment agency for Greater Kuala Lumpur (Greater KL), has further strengthened the country's appeal as a base for innovation-led initiatives.

"Malaysia's growing focus on eco-friendly technologies aligns strongly with our global sustainability ambitions," added My Lan. One of the most promising aspects of the Nilai Centre is its role in cross-functional and global collaboration.

As part of AkzoNobel's global R&D ecosystem, the facility will exchange insights and innovations with other hubs worldwide. It will also enable closer collaboration between R&D, marketing, supply chain, and sales teams, streamlining the innovation process and ensuring alignment with market needs.

Through this new facility, AkzoNobel is not just investing in a building, but in a forward-looking strategy that champions local relevance and global excellence. Whether it's through heat-reflective technologies like KeepCool (background) or advanced weather-resistant paints for tropical climates, the Nilai R&D Centre is primed to drive meaningful innovation that enhances the lives of its Southeast Asian consumers.

KeepCool technology uses special pigments to reflect infrared heat, in turn reducing the amount of heat that is transferred to indoor spaces. Which means interiors are kept cooler and less energy is required.

"Sustainable innovation is not a separate initiative; it's how we operate and how we lead. Through facilities like Nilai, we're reinforcing that commitment – ensuring our decorative paints contribute to both a better environment and improved quality of life," My Lan summed up.

Discover the Beauty of Intentional Living With Dutch Boy® Paints' 2026 Color of the Year: Melodious Ivory

Dutch Boy® Paints, a leader and trusted name in the coatings industry, announces Melodious Ivory (313-2DB) as its 2026 Color of the Year. This inviting neutral speaks to a cultural shift toward simplicity, authenticity and intentional living – qualities that are shaping the way homeowners design and experience their spaces, notes a press release from the company. Melodious Ivory's soft, creamy beige embodies timeless warmth and grounded calmness, offering a versatile, understated foundation that complements a wide range of interior styles – from modern to traditional to rustic.

“Our 2026 Color of the Year invites homeowners to embrace what matters most—comfort, quality and connection,” said Lisbeth Parada, Color Marketing Manager, Dutch Boy Paints. “Melodious Ivory offers a classic backdrop that beautifully supports the textures, elements and personal touches that make a space truly feel like home.”

From charming homestead exteriors to sun-drenched kitchens and cozy bedrooms, Melodious Ivory helps create environments that are warm,

balanced and timeless. It pairs effortlessly with a wide range of materials, including timeworn wood, handmade crafts and comfy textiles, supporting the rise of slow living, mindful consumption and nostalgia-inspired aesthetics in today's design landscape.

Selected through a trend-forecasting process that blends design research, market insights and cultural analysis, Melodious Ivory reflects both the mood of the moment and the enduring appeal of a color that transcends trends. In addition to its Color of the Year, Dutch Boy Paints unveiled its full 2026 Color Trends Forecast, including three thoughtfully curated color palettes that spotlight Melodious Ivory's quiet versatility and warm sophistication:

Heartland – The Heartland palette pays tribute to traditional craftsmanship, drawing inspiration from the timeless beauty of the past. Influenced by the revival of classic décor, from hand-crafted furniture to gingham textiles and Shaker-style woodwork, it's perfect for interiors that feel timeless and exteriors designed for



Dutch Boy Paints' 2026 Color of the Year Melodious Ivory invites homeowners to embrace what matters most—comfort, quality and connection.

gathering with friends and family. Featuring Old Chaparral (402-7DB), a rich, earthy red; Melodious Ivory (313-2DB), a soft, grounding neutral; and Blue Laguna (432-5DB), a faded denim blue, this palette captures a nostalgic charm that feels both familiar and refreshingly relevant.

Rekindle – The Rekindle palette channels the growing desire for wellness, sustainable living and connection to nature. Rooted in authenticity, it creates calm, earthy sanctuaries where simplicity takes the lead, and the home becomes a restful refuge. With the sunlit softness of Melodious Ivory (313-2DB), the organic warmth of 10 Gallon Hat (412-3DB) and the soothing balance of Cypress Garden (424-4DB), this palette reflects a nature-inspired, harmonious lifestyle, one that embraces mindful living and quiet reflection.

Serendipity – The Serendipity palette captures life's small joys – those “glimmers” of happiness that spark connection, comfort and

creativity. Infused with retro-inspired energy, it's designed to bring personality and playfulness to modern minimalist spaces. Anchored by Melodious Ivory (313-2DB) and energized by the vintage glow of Simply Yellow (115-3DB) and the warmth of Nice Nectarine (210-4DB), this palette invites cheerful expression and heartfelt connection throughout the home.

The Dutch Boy Paints 2026 Color Trends Forecast aims to simplify the painting experience for homeowners by providing an extensive selection of one-coat colors, including Melodious Ivory and its complementing palettes.

Founded in 1907, Dutch Boy Paints continues to be a leader in delivering innovative, high-quality paint and packaging solutions. Known for its heritage, trusted performance and promise of Simple Solutions, Dutch Boy Paints empowers homeowners and professionals alike with tools to create beautiful, lasting results – now and for generations to come.



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Biomimetic teakwood structured environmental barrier coating

The core message of the article is that researchers have developed an innovative technology in plasma spraying-physical vapor deposition known as alternating vapor/liquid phase deposition. By adjusting the arc current, researchers can finely control the evaporation and deposition of SiO_2 , and through a heat treatment process, achieve in-situ reactions that optimize the composition, structure, and nanoscale dimensions of the coating, creating an orderly arranged multi-layered teak-like biomimetic structure within it, notes a press release from EurekAlert. They have conducted an in-depth analysis of the complex deposition mechanisms involved in this process. This new teak-like biomimetic structure coating is expected

to significantly enhance its mechanical properties and corrosion resistance, providing an innovative coating protection strategy for high-temperature applications in the field of gas turbine engines.

The team published their work in *Journal of Advanced Ceramics*.

“Biomimetic research on environmental barrier coatings is relatively rare, primarily because there are significant challenges in precisely controlling the composition and structure of the coatings during the high-temperature spraying process. We have chosen teak, known for its excellent mechanical properties and environmental durability, as the biomimetic subject. By employing the vapor-liquid

phase interval deposition method and regulating parameters during the spraying process, such as arc current, we have achieved the evaporation and deposition of SiO_2 , thereby constructing a regularly arranged multi-layer structure within the coating. This unique deposition mechanism allows us to mimic the natural layered structure of teak, which is crucial for enhancing the mechanical properties and corrosion resistance of the coating,” said Dr Guifang Han, the corresponding author of the paper, a professor in the School of Materials Science and Engineering at Shandong University.

“From a thermodynamic perspective, we have conducted an in-depth analysis of the deposition

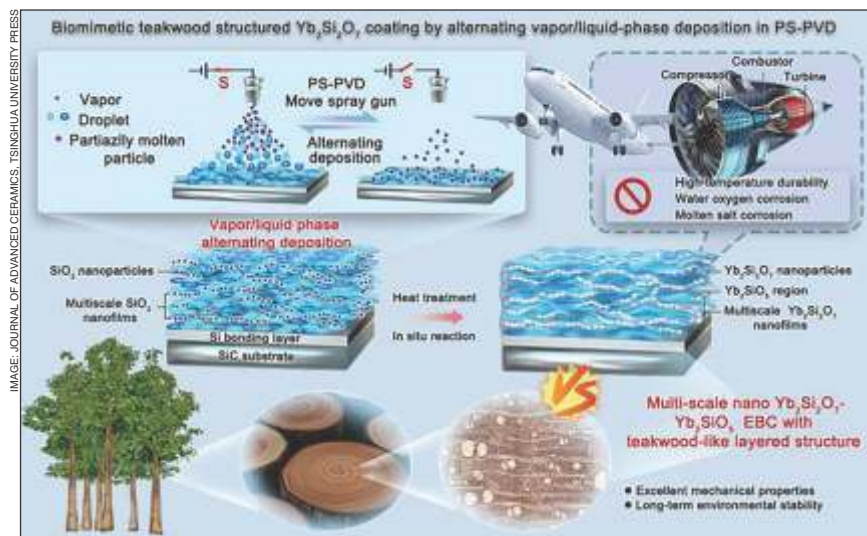
structure, and nanoscale dimensions of the coating, successfully achieving a functional structure that biomimics teak wood,” said Dr Guifang Han.

Despite the progress made, there is still much to explore in the field of biomimetic teak structure environmental barrier coatings. In this regard, Han also emphasized that the key to future research will be the systematic evaluation of the corrosion resistance and mechanical properties of these coatings, and comparing them with the findings in existing literature to verify their effectiveness in practical applications. The ultimate vision of the research is to commercialize these coating technologies, thereby enhancing the protection efficiency of high-temperature applications such as gas turbine engines.

mechanism of volatilized SiO_2 gas during the spraying process. We have ingeniously applied heat treatment technology to facilitate an in-situ reaction between the gas-phase deposited SiO_2 and Yb_2SiO_5 , which is produced from the decomposition of $\text{Yb}_2\text{Si}_2\text{O}_7$ powder, to reform $\text{Yb}_2\text{Si}_2\text{O}_7$. This approach allows us to simultaneously regulate the composition,

Other contributors include Jungui Zhang, Xinxin Cao, Jingde Zhang from the School of Materials Science and Engineering at Shandong University in Jinan, China; Xiaofeng Zhang, Min Liu, Kesong Zhou from the Institute of New Materials at Guangdong Academy of Sciences in Guangzhou, China.

This work was supported by the National Natural Science Foundation of China, Natural Science Foundation of Guangdong Province, Guangdong Special Support Program, Guangdong Provincial Science and Technology Program, Science Center for Gas Turbine Project.



The multi-scale layered structure of teak wood endows it with exceptional mechanical properties and environmental stability, which has inspired the biomimetic design of environmental barrier coatings. In this study, a multi-scale nano $\text{Yb}_2\text{Si}_2\text{O}_7$ - Yb_2SiO_5 composite EBC with a teakwood-like lamellar structure has been realized by a novel alternating vapor/liquid phase deposition method in plasma spraying-physical vapor deposition (PS-PVD). In this process, the SiO_2 that is volatilized from $\text{Yb}_2\text{Si}_2\text{O}_7$ is recaptured and deposited, and then undergoes an in-situ reaction with Yb_2SiO_5 in the coating through heat treatment, leading to the formation of $\text{Yb}_2\text{Si}_2\text{O}_7$, and the construction of a regularly arranged multi-layered nanostructure. The coating designed with this structure is expected to significantly enhance its mechanical performance and corrosion resistance, offering the potential for long-term protection of aircraft engines in high-temperature environments.

TPU scientists improved the properties of high-entropy ceramic coatings for aviation

Scientists at Tomsk Polytechnic University have found out how to improve the properties of new high-entropy ceramic coatings to be used at ultra-high temperatures and in aggressive environment. TPU researchers have managed to achieve increased resistance of carbide materials to oxidation at 1100°C. In the future, such coatings can be used for aviation and aerospace equipment elements, notes a press communiqué from the University.

The results of the research, supported by the Russian Science Foundation grant, are published in *Ceramics International*.

TPU scientists are working on the development of fundamentally new multilayer coatings that can significantly increase their operation temperature range. Coatings based on oxides of hafnium, zirconium, cerium, and yttrium were synthesized earlier. The magnetron sputtering method is used for their application. The synthesis and investigation of the properties of high-entropy materials based on carbides has become the next stage of the research.

Ceramics based on hafnium carbide and zirconium carbide is a unique class of materials that combine extreme thermomechanical properties with chemical stability, making them indispensable for ultra-high temperatures and aggressive environments. However, their tendency towards catastrophic oxidation at temperatures above 500°C, which leads to progressive degrada-



TPU scientists are working on the development of fundamentally new multilayer coatings that can significantly increase their operation temperature range.

tion of the material, cracking and peeling of the protective layer, remains a key limitation for their widespread use. One of the strategies to combat this problem is alloying, aimed at forming dense, often self-recovering oxide films. However, traditional alloying often degrades basic carbide properties.

According to the scientists, the concept of entropic stabilization of multicomponent carbides is more promising. Such alloys show a synergistic 'cocktail effect' combining advantages of individual components. Thus, thermodynamic stabilization of high-entropy phases suppresses defect formation at high temperatures, while simultaneously improving functional characteristics, including thermal conductivity and resistance to ablation (destruction of something by evaporation, chipping, erosion processes). Besides, entropic stabilization of such systems not only increases the oxidative stability of carbides, but also ensures the structural integrity of material over a wide temperature range.

Thin-film high-entropy

coatings that can serve as intermediate layers between traditional thermal barrier coatings based on zirconium dioxide stabilized with yttrium oxide and heat-resistant substrates, for example, made of nickel and chromium alloys, are of particular interest. Such alloys demonstrate extreme resistance to peeling during thermal cycles.

"At the same time, existing studies focus mainly on alloying zirconium carbide and hafnium carbide with tantalum, niobium, and titanium, while the potential of alloying with aluminum and chromium remains poorly studied. In this study, we synthesized a high-entropy alloy combining a refractory base matrix of hafnium and zirconium carbides with oxidizing additives of aluminum, chromium and tantalum. This combination overcomes the structural incompatibility of carbides, effectively suppressing phase segregation," comments one of the joint authors, leading researcher at the TPU Research School of High-Energy Process Physics Sergey Zenkin.

The coatings were deposited on the substrates by magne-

tron sputtering. The obtained samples were tested for oxidation at temperatures up to 1100°C.

Then, the structural properties and elemental composition of the coatings were analyzed. As a result, it was found that high-entropy coatings based on hafnium and zirconium carbides with additives of aluminum, chromium and tantalum demonstrate increased resistance to oxidation at 1100°C.

The researchers specify that the synthesized and studied coatings show better oxidation resistance compared to materials based on unalloyed hafnium and zirconium carbides (up to 20 times) and alloys separately alloyed with aluminum and chromium (up to 7 times). Currently, scientists are testing double oxide-carbide high-entropy systems, studying their thermal and mechanical characteristics, as well as their interaction at extreme temperatures.

The project involves employees of the TPU Research School of High-Energy Process Physics and Engineering School of New Production Technologies.

Advanced corrosion assessment using AI-powered imaging technology

Researchers at the Indian Institute of Science (IISc) and the Qatar Science and Technology Research Center (QSTC) have developed a new automated method to assess corrosion in industrial equipment using advanced machine learning and image analysis, notes a press release from EurekAlert.

Published in *npj Materials Degradation*, the study describes a novel machine learning algorithm that can analyse microscope images of corroded metal surfaces to estimate corrosion severity, without requiring human input.

“Corrosion poses significant economic and safety challenges in industries like power generation and oil/gas,” says Phaneendra K Yalavarthy, Professor at the Department of Computational and Data Sciences (CDS), IISc, and senior author of the study.

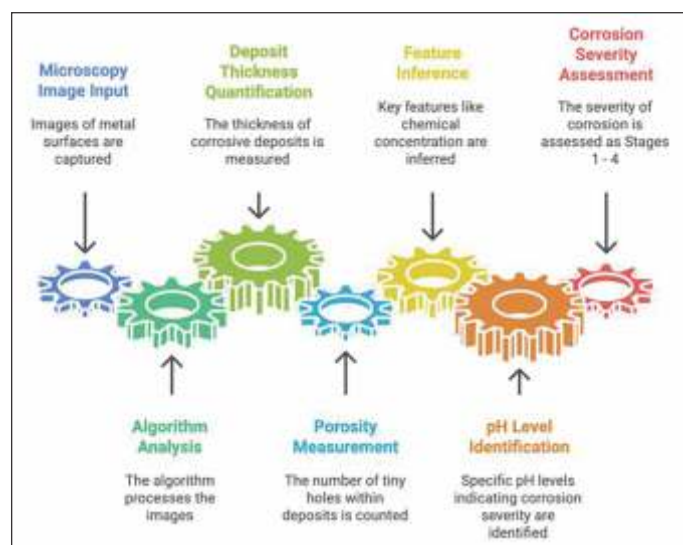
“[It] silently compromises the integrity of these systems, putting lives and livelihoods at risk and burdening society with escalating maintenance costs,” adds co-author Ashwin RajKumar, former postdoctoral researcher at CDS.

The AI-based technique focuses on two critical indicators of corrosion: the thickness of corrosive deposits on the surface of metals and the porosity (number of tiny holes) within those deposits. When microscopy images of metal surfaces are fed to the algorithm, it can quantify

these two characteristics and infer key features that indicate how much corrosion has happened. These features include the concentration of corrosive chemicals and the acidity of the environment beneath the deposits. “As the rust-like deposits get thicker, there's more chloride present, and the surface becomes more acidic,” explains Yalavarthy. “We identified specific pH levels that indicate when corrosion is worsening. For example, when the pH drops below 2.8-3, it means that the corrosion has reached a very severe stage.”

“It was striking to see such a strong and consistent correlation between local pH and corrosion stage, especially the threshold at pH ~2.8-3 that delineates the transition from Stage 3 to Stage 4,” says RajKumar. “This suggests that surface morphology and local chemistry are more tightly coupled than previously appreciated, offering a valuable predictive marker for escalation in corrosion severity.”

The researchers tested their method in checking the under-deposit corrosion (UDC) of steam generator tubes – a particularly challenging and prevalent form of corrosion in industrial boilers and other high-temperature environments. “[The algorithm] is quite accurate, getting it right about 73% of the time,” says Yalavarthy. “[It] is faster and more consistent than having people manually examine the optical micros-



High-level overview of the AI-based technique with critical indicators for corrosion severity assessment.

copy images to determine the severity of corrosion.”

What also sets this method apart is its unsupervised learning approach – it does not rely on predefined class labels or manually annotated datasets, which are often scarce or inconsistent in corrosion studies. Instead, it employs k-means clustering, a machine-learning technique that segments microscopy images into distinct regions (such as deposits and pores) without prior assumptions about their appearance. This is particularly useful when corrosion product structures are complex and vary significantly.

While the approach may be adapted to a variety of corrosion product morphologies, it would need to be tailored to each specific case, since morphological features differ across corrosion mechanisms, the researchers caution. “The

next critical step is to validate the algorithm on much larger and more diverse datasets, capturing the full spectrum of deposit morphologies and operating conditions encountered in industrial practice,” says RajKumar.

Such a technique is promising for industrial maintenance and operations, as it can enable quantitative, data-driven corrosion assessment across facilities and sectors. Integrating it with digital monitoring systems can further contribute towards industrial digitalization, offering meaningful benefits in safety, operational efficiency, and materials science research.

“Drawing from our background in biomedical image analysis – where optical microscopy and automated detection already save lives – we were inspired to bring similar intelligence and rigour to corrosion science,” says Yalavarthy.

Newly launched AMPP Kerala Chapter aims to transform the challenge of corrosion management into an opportunity in the region

The AMPP Kerala Chapter, inaugurated on August 22, 2025, in Kochi, by the AMPP India Area Representative Dr U. Kamachi Mudali, reflected the organization's recognition of the region's significant growth and engagement in the field of materials protection and performance.

AMPP, a world leader in standards and training has recently designated India as a separate area to focus on.

The AMPP India Area comprises 6 chapters and 7 student chapters with the AMPP Kerala Chapter as the latest addition.

Delivering the Presidential Address, Mr Jolly Lonappan, Chapter Delegate Designate of the AMPP Kerala Chapter, said: "Kerala, with its highly literate and globally employed youth, is ideally positioned to become a leader in corrosion mitigation. With the right



At the inaugural function of the AMPP Kerala Chapter in Kochi.



Dr U. Kamachi Mudali pinning the AMPP Kerala Chapter lapel pin on Mr Jolly Lonappan as part of the Investiture ceremony.



The evening was well-attended with over 65 delegates from leading organizations based in Kerala.

awareness, training, and collaboration, we can transform this challenge into an opportunity."

"The AMPP Kerala Chapter aspires to be the vehicle of this change," he said.

"Through seminars, training programs, and knowledge sharing, we aim to raise awareness and equip our workforce with modern skills."

Confidently he emphasized

that the AMPP Kerala Chapter would emerge as a leading force in corrosion control and mitigation by bringing together industry, academia and R&D.

"After all, Kerala, 'God's Own Country,' with its 569.7 km coastline, is particularly prone to corrosion," he said. "The state is home to critical sectors such as the Cochin Shipyard, the Southern Naval Command, Vizhinjam Port,



(From the left) Mr Sanjay Namdeo, Mr Jinu Joy, Mr Jolly Lonappan, Dr U. Kamachi Mudali, Mr Jose Antony, Mr Abby Joseph, and Mr Theo Rajan.

PHOTOS: AMPP

BPCL Kochi Refinery, GAIL's LNG Terminal, and FACT, along with numerous smaller shipyards and mineral processing industries. Protecting these assets is not only vital for Kerala but also for India's economy and defense."

The Chief Guest of the evening Dr Kamachi, captivated the audience elucidating the importance of tackling the menace of corrosion. He said: "We may not be able to eradicate corrosion all of a sudden, but it can be done gradually. Say 21 years down the line from today in 2047, if we are able to pull down the rate of corrosion gradually from the present 4.2 percent to 2.1 percent, it would be a great achievement. This can be done if we make an effort to reduce the cost of corrosion by 0.1 percent every year. The savings are huge! If we look at our Rs 3.1 trillion GDP today, 0.1 percent of that is a whopping Rs 30,100 crore!"

Dr Kamachi then inaugurated the AMPP Kerala Chapter website followed by an Investiture ceremony by pinning the AMPP Kerala

Chapter lapel pins on each of the Chapter's office bearers. The office bearers comprised Mr Jolly Lonappan, Chapter Delegate Designate, AMPP Kerala Chapter; Mr Jose Antony, Chairman Designate; Mr Abby Joseph, the Secretary Designate; and Mr Jinu Joy, Member-at-Large.

Mr Jose Antony, as Chairman of the Chapter, on behalf of all the office bearers, thanked the AMPP for entrusting the responsibility of taking the chapter forward in a positive direction by helping society in its drive against corrosion. He assured the Chapter's support and its best efforts in promoting all activities that AMPP will be organizing in upcoming days and months in the state of Kerala or elsewhere.

Said Mr Antony: "Our plan includes having regular forums online / onsite to foster oneness among the industry so that we can make efforts in public policy, standards development, and international partnerships and foster initiatives aimed at advancing the field of materials protection and performance, including technological



Mr Jolly Lonappan felicitating Mr Theo Rajan, General Manager, Bharat Petroleum Corporation Ltd., at the inaugural function.

innovation and new developments."

He also articulated on the need of the industry to come forward and enrol themselves as members of AMPP, so that together they can address key challenges facing the industry, such as corrosion control and workforce development.

The Special Guest of the evening was Mr Sanjay Namdeo, recently appointed by AMPP as the Director of Operations in India expressed strong support and words of encouragement for the chapter. His PowerPoint Presentation 'Role of AMPP and its Aspirations in India' elucidated the various activities of AMPP and shared the broader vision for India.

Mr Theo Rajan, General Manager, Bharat Petroleum Corporation Ltd., Cochin Refinery offered his felicitations by expressing his appreciation with a hope that the new Chapter would be a stepping stone for Kerala in its march towards an increased level of awareness and will boost the energy in application of new technologies and initiatives in the fight against corrosion in the area.

Dr Gasem Fallatah, Vice President, Strategic Geographies -- AMPP, through a video message, conveyed his best wishes and reiterated the strategic importance of the new Chapter.

The evening was well-attended with over 65 delegates from leading organizations as diverse as the Bharat Petroleum Corporation Ltd (BPCL), Cochin Shipyard Ltd, Defence Research and Development Organisation (DRDO), Kochi Metro Rail Ltd (KMRL), the Indian Navy, The Fertilisers and Chemicals Travancore Ltd (FACT), GAIL (India) Ltd, BSS Technologies, AkzoNobel, Ruttles Ltd., SeaBlue Shipyard, Titan Blasters, Global Marine Tech, Whale Marine Engineering, Marino Navale, Logistics Park, and many more.

The event was professionally conducted by Mr Abby Joseph, Secretary, AMPP Kerala Chapter, and the Master of Ceremonies, Mr Jinu Joy. The meeting concluded with a conventional vote of thanks by the program convenor Prof Giby George, followed by fellowship dinner at the Blastline Institute's premises.



Welcoming guests at the inaugural function of AMPP Kerala Chapter.

ICECORR 2025 succeeds in its primary objectives of knowledge exchange, technology transfer, and professional networking

The Association for Materials Protection and Performance (AMPP), Chennai Chapter, organized the First International Conference and Exhibition on Corrosion (ICECORR 2025) August 20–22, 2025, at Le Méridien, Kochi, Kerala. The event was held concurrently with the 5th International Conference and Exhibition on Non-Destructive Evaluation (ICENDE 2025), hosted by ASNT India Section, in collaboration with the American Welding Society (AWS) and AWS India Section.

Background and rationale

Corrosion continues to remain as one of the most persistent challenges across industries, resulting in global annual losses estimated in trillions of US dollars. It affects nearly all metal-based assets across diverse domains such as oil & gas, refineries, fertilizers, petrochemicals, pharmaceuticals, chemical processing,

marine and shipping, automotive, defence and aerospace, power generation, transport and railways infrastructure, mining and metals, food and beverages, and renewable energy (notably solar technologies). These losses negatively impact asset availability, escalate maintenance costs, and reduce service life.

ICECORR 2025 aimed to provide a global platform for knowledge dissemination and the exchange of best practices, cutting-edge technologies, and recent advancements in materials, corrosion prevention, protection technologies, mitigation strategies, and monitoring systems. The conference and exhibition was inaugurated by their patron Dr U. Kamachi Mudali, Vice Chancellor, Homi Bhabha National Institute, Mumbai along with a host of dignitaries including Dr S.V.S.

Narayana Murty, Chairman & Managing Director, MIDHANI, Hyderabad and Dr M. Venkatachalam, Director (Power) of NLC India Limited. The conference was envisioned as a convergence point for academia, research and development organizations, industry leaders, and public and private sector stakeholders.

Technical programme highlights

The scientific program of ICECORR 2025 was designed with an emphasis on multidisciplinary approaches to corrosion challenges. It featured:

- 8 keynote lectures delivered by internationally renowned experts
- 3 invited talks by distin-

guished speakers

- 48 technical papers presented in oral and poster formats
- 18 poster presentations
- A special session on “Corrosion of Stainless Steels and Their Industrial Applications”, sponsored by Jindal Stainless Ltd.
- A dedicated Young Scientist Session (Hybrid



Parallel to the technical sessions, ICECORR 2025 hosted a comprehensive exhibition where leading industrial organizations showcased technologies, products, and services related to materials protection, corrosion prevention, and advanced monitoring tools.

PHOTOS: ICECORR 2025



The conference was envisioned as a convergent point for academia, R&D, and development organizations, industry leaders, and public and private sector stakeholders.



The conference and exhibition were inaugurated by Dr U. Kamachi Mudali, Vice Chancellor, Homi Bhabha National Institute, Mumbai.

Mode), enabling participation through oral and poster presentations

In addition, the scientific programme was structured into seven technical sessions, each focusing on a specific thematic area:

1. Corrosion prevention in oil & gas, refineries, and petrochemical sectors – I
2. Corrosion resistant stainless steels and their industrial applications (Sponsored by Jindal Stainless Ltd.)
3. Infrastructure-related corrosion problems and prevention strategies
4. Nanostructured and high-performance coatings for corrosion protection
5. Corrosion evaluation and mitigation strategies in industries

6. Corrosion prevention in oil & gas, refineries, and petrochemical sectors – II

7. Young Scientist Session (Hybrid: oral and poster presentations)

The Young Scientist Session was a highlight of ICECORR 2025. It provided a vibrant interactive platform for emerging young researchers to showcase innovations. After evaluation by a panel of experts, 9 Best Paper Awards with cash prizes were conferred upon 10 young scientists.

Participation and international outreach

ICECORR 2025 along with other events

together witnessed overwhelming participation, with over 600+ delegates representing:

- Universities and academic institutions
- National R&D laboratories and research organizations
- Public and private sector industries
- Government agencies and policy stakeholders

The conference had a strong international dimension, with active contributions from experts and researchers from USA, UK, Singapore, Australia, Israel, UAE, and Saudi Arabia. The delegates actively engaged in technical sessions, fostering cross-disciplinary discussions and opening new avenues for international collaborations.

Exhibition and industry engagement

Parallel to the technical sessions, ICECORR 2025



ICECORR 2025 along with other events together witnessed overwhelming participation, with over 600+ delegates.

hosted a comprehensive exhibition where leading industrial organizations showcased technologies, products, and services related to materials protection, corrosion prevention, and advanced monitoring tools. The exhibition drew significant interest, providing participants with insights into industrial applications and new business opportunities.

Releases and networking events

- The compilation of abstracts was formally released as a souvenir-abstract volume by the dignitaries during the inaugural session.
- A welcome reception and networking cocktails were hosted on August 20, 2025.
- A Grand Celebration Night and Gala Dinner was organized on August 21, 2025, facilitating informal networking among participants, fostering collaborations, and encouraging student-industry interactions.

The conference concluded with a formal Valedictory Function on August 22, 2025. Dr U. Kamachi Mudali, Patron, delivered the Valedictory Address, summarizing the key outcomes of ICECORR 2025 and outlining future directions for research and collaboration in corrosion mitigation. He also presented the Best Paper Awards to the winners of the

Young Scientist Session. Mr Sanjay Namdeo, Director of AMPP India Operations participated in the ICECORR and interacted with the participants. A stall from AMPP Chennai Chapter highlighted the activities of the AMPP USA and Chennai Chapter and a number of participants showed interest in becoming members of AMPP.

ICECORR 2025 succeeded in its primary objectives of knowledge exchange, technology transfer, and professional networking in the crucial domain of corrosion science and engineering. With the enthusiastic participation of national and international delegates, leading industrial organizations, academia, and young researchers, the conference has established itself as an eminent forum for shaping the future of corrosion prevention and materials protection strategies.

The AMPP Chennai Chapter, along with its strategic partners, look forward to hosting future editions of ICECORR, building on the resounding success of ICECORR 2025 in Kochi, to facilitate the dissemination of knowledge on corrosion prevention and control and encourage the stakeholders to become part of AMPP in its mission to protect the assets against corrosion damage.

CHINACOAT2025: A global platform for future tech

CHINACOAT2025 will take place in Shanghai from November 25 – 27, uniting the global paints and coatings community. With a legacy since 1996, it is a global platform for future technology, fostering connections, innovations and growth in an ever-evolving marketplace. This year, over 1,240 exhibitors from 31 countries/regions are going to showcase their cutting-edge solutions and advancements across more than 99,200 square metres of exhibition space. The event will be held at the Shanghai

New International Expo Centre (SNIEC), Halls E2 – E7, W1 – W3, where visitors can discover the latest innovations, attend expert-led technical exchange programmes and network with industry peers from around the world, notes a press release from the organizers.

Gain insights with concurrent technical programs

A series of concurrent Technical Programs will be held during the exhibition to foster knowledge exchange



PHOTOS: CHINACOAT

CHINACOAT 2025 serves as the hub for sourcing, knowledge sharing, and networking, paving the way for sustainable growth and future-ready solutions.

and idea sharing:

□ Technical seminars and webinars: Explore expert perspectives on cutting-edge technologies, eco-friendly solutions and evolving industry dynamics. Sessions will be available both online and offline.

□ Country presentations: Focusing on the latest market policies, trends and development strategies in emerging economies, particularly in the South East Asia region, providing valuable insights and business opportunities.

Driving the future of coatings

As the coatings industry faces rapid transformation and intensifying competitions, CHINACOAT2025 empowers businesses to accelerate technological advancements, adopt sustainable manufacturing practices and advance intelligent production. The exhibition connects key stakeholders across various segments, including raw materials, equipment and R&D applications. Whether

visitors are seeking breakthrough innovations, strategic partnerships or market insights, CHINACOAT2025 serves as the hub for sourcing, knowledge sharing and networking, paving the way for sustainable growth and future-ready solutions.

Register before October 17 to enjoy VIP visitor experience

Industry professionals are welcome to register at www.chinacoat.net or via their WeChat platform (ID: ChinaCoat_SFChina) now. Overseas visitors who successfully register by October 17 can enjoy special rate on the original registration fee, exclusive access to the Overseas & Invited Visitors Lounge and receive complimentary Exhibition Directory along with a souvenir (while stocks last). Stay updated and informed by following CHINACOAT on Facebook, X, LinkedIn and YouTube, or contact the Organizer for any latest event highlights.



With a legacy since 1996, CHINACOAT is a global platform for future technology, fostering connections, innovations, and growth in an ever-evolving marketplace.



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OCT 06 – 08, 2025	CORCON 2025	Jaipur, India	AMPP India Chapter	T: (91-22) 25797354 E: info@naceindia.org W: corcon.org
OCT 08 – 09, 2025	PAINT AND COATINGS	Superstudio Maxi, Milano, Italy	STEP Exhibitions	T: +39 334 344 3528 E: pci@step-exhibitions.com W: paint-coatings.it
NOV 03 – 06, 2025	ADIPEC	Abu Dhabi, UAE	dmg events	E: enquiry@adipec.com W: adipec.com
NOV 12 – 13, 2025	USA COATINGS SHOW 2025	MeadowLands Exposition Centre, New York, USA	United Expo	E: unitedexpo@gmail.com W: usa-coatings-show.com
NOV 24 – 26, 2025	GULF COATINGS SHOW 2025	Expo Centre, Sharjah, United Arab Emirates	NürnbergMesse GmbH	E: matthias.janz@vincentz.net W: www.gulf-coatings-show.com
NOV 25 – 27, 2025	CHINACOAT 2025	Shanghai New International Expo Centre (SNIEC), Shanghai, China	Sinostar	E: info@sinostar-intl.com.hk W: www.chinacoat.net
DEC 09 – 11, 2025	ASSET INTEGRITY CORROSION AND COATINGS CONFERENCE	Baku, Azerbaijan	Aldrich Energy	T: +971 4837 4300 E: register@aicccaspian.com W: aicccaspian.com
DEC 13 – 15, 2025	INDIA INTERNATIONAL PAINT AND COAT EXPO 25	GUCEC, Ahmedabad, Gujarat, India	Aries Events Pvt Ltd	T: +91 98989 70009 E: dirapm.aakar@gmail.com W: iipce.co.in
JAN 27 – 29, 2026	5th MECOC EXPO	Abu Dhabi, UAE	Aldrich	T: +971 4 837 4300 E: register@mecocmiddleeast.com W: mecocexpo.com
FEB 19 – 21, 2026	PAINTINDIA	Bombay Exhibition Centre, Mumbai, India	NürnbergMesse India Pvt. Ltd	T: (+91 22) 62165323 E: paintindia.expo@colorpub.in W: nm-india.com
MAR 15 – 19, 2026	AMPP ANNUAL CONFERENCE + EXPO	Houston, Texas, USA	AMPP	W: ace.ampp.org
APR 06 – 08, 2026	INDIA PAINT & COATING EXPO	Bangalore International Exhibition Centre Bengaluru, India	Media Day Marketing	E: expo@mediaday.co.in W: paintandcoatingexpo.com
APR 14 – 17, 2026	PAINTEXPO	Karlsruhe, Germany	Leipziger Messe	M: +91 9166565118 E: b.verma@leipziger-messe.de W: paintexpo.com
MAY 05 – 07, 2026	AMERICAN COATINGS SHOW AND CONFERENCE	Indiana Convention Center, Indianapolis, Indiana, USA	American Coatings Association	E: cmatthews@paint.org W: american-coatings-show.com
MAY 05 – 07, 2026	SURFACE TECHNOLOGY GERMANY 2026	Stuttgart Exhibition Centre, Stuttgart, Germany	Deutsche Messe	E: info@messe.de W: messe.de
JUN 11 – 13, 2026	EXPO PAINT AND COATINGS 2026	Chennai Trade Centre Chennai, India	Toredo Fairs India Pvt Ltd	T: +91 9341928011 E: info@expopaintcoating.in W: expopaintcoating.in

Please note, schedules are subject to last minute changes.

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