HEMPEL
Trust is earned

Port Equipment and Cranes

Advanced protection in challenging maritime environments

Superior protection in the harshest environments

Corrosion isn't just a maintenance issue—it's a serious threat to safety, uptime, and long-term profitability. Coastal environments expose cargo handling equipment, cranes, and infrastructure to extreme conditions that demand more than standard protection.

That's where our cutting-edge zinc-rich coating technology comes in.

Developed with unique patented technology, Avantguard® sets a new benchmark in corrosion resistance. It's the first activated zinc primer to use three methods of anti-corrosive protection: Barrier effect, Inhibitor effect and Galvanic effect. The result is superior corrosion protection with higher durability and less environmental impact compared to standard zinc-rich primers.

For port operators, this means longer asset life, reduced downtime, and lower total maintenance costs.

For equipment manufacturers, it means offering your customers a coating solution that combines strength, durability, and environmental responsibility.

By enabling faster curing, improved application properties, and extended protection, Avantguard helps you build and maintain smarter, more resilient port infrastructure—while contributing to a more sustainable future.

Here's how. In a standard zinc epoxy primer, only one third of the zinc content is typically effective in protecting the steel from corrosion. Avantguard is different. Its unique Triple Activation technology fully utilises the zinc content to deliver unrivalled anti-corrosive protection.

- Barrier effect: Zinc salts formed throughout the film increase barrier properties to lower water permeability.
- Inhibitor effect: Avantguard captures the ions and creates a powerful inhibition effect to combat rust.
- Galvanic effect: The unique activation process in Avantguard efficiently utilises the zinc content and improves galvanic protection.

Meeting industry challenges

Choose a brand you can trust for your cranes and ports equipment.

At Hempel, we bring over a century of expertise in protective coatings to help you meet these challenges with confidence. Whether you're constructing new port equipment or maintaining existing assets, our advanced anti-corrosion solutions are engineered to deliver long-term protection, reduced maintenance, and maximised uptime.

Backed by decades of global experience in coastal and marine applications, our high-performance coating systems are trusted by crane manufacturers and port operators worldwide. Designed to withstand aggressive coastal conditions, our systems protect everything from structural steel to internal components—offering outstanding durability, strong adhesion, and excellent resistance to corrosion.

With proven technology that enhances performance, simplifies maintenance, and extends the service life of critical infrastructure, Hempel keeps your equipment operating reliably—day after day, year after year.

Port Equipment and Cranes

Introducing the new **Avantguard 750 Pro**

Benefits with Avantguard 750 Pro

Hempadur Avantguard 750 Pro is the newest and most sustainable zinc-rich epoxy primer in the Avantguard range. It's the perfect choice for projects where low VOC and extended durability are required.

Extended durability

Designed to exceed the current standards, Avantguard 750 Pro is recommended to achieve durability beyond 35 years and performance guaranteed with certified coatings systems.

Simple specifications

With one product for new build, repairs and maintenance, and its suitability for lean coating schemes, Avantguard 750 Pro keeps specifications simple. Plus, with its market leading VOC content, you can be sure your specifications meet the latest health and safety and environmental standards.

Sustainability gains

Avantguard 750 Pro has been tested and certified in lean coating schemes, allowing for a significant reduction in paint consumption, resulting in up to 35% less CO_2 and 52% less VOC emissions* compared to traditional zinc-rich coating systems.

Efficient application

In addition to being suitable for 2-coat systems, Avantguard 750 Pro is fast drying and has an overcoating interval of just 1 hour at 20°C, resulting in up to a 1.7x faster application time*. This, coupled with its high surface tolerance and superior mechanical properties, leads to improved application productivity.

*savings calculations are coating system dependent

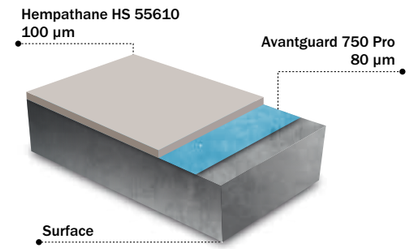
Special systems

Avantguard 750 Pro outperforms conventional zinc-rich primers, allowing for special systems with reduced dry-film thicknesses and 2-coats up to C5-H according to ISO 12944.

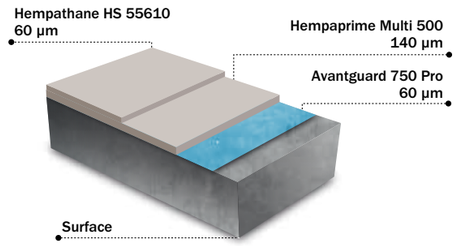
System comparison*	Reference system	3 coat system	2 coat system
VOC emission [g / m²]	91	82	51
Paint consumption [%]	100	85	79
Application time [hours]	9	6.45	1.45
CO_2 emission - embodied [g CO_2e / m² . year]	149-89	111-66	152-91
Effective durability (years)	15-25	18-30	15-25

** The "Reference system" is calculated as the average of 5 zinc-rich epoxies; a pool that includes one Hempel and four other standard market primers.

2 coat system



3 coat system



Lasting support throughout your crane's lifetime

Our structured technical service is designed to deliver exceptional support at every stage of your application journey.

Before application
Our expert team provides proactive guidance and tailored advice to ensure your project gets off to the best possible start.

During application
We offer hands-on, on-site supervision and consultation, along with detailed documentation to keep you fully informed on progress and performance.

After application
Our comprehensive after-sales support includes follow-up visits to assess your coating system and recommend maintenance or repair solutions—helping you extend the life and value of your investment.

With Hempel by your side, you gain a trusted partner committed to your long-term success.

Hempel CraneCare

Our solution for crane maintenance

Service Offerings	
Detailed visual corrosion and coating inspection supported by	• Advanced UAV • Anomaly assessment • Conventional NDT such as UT / MPI
Personnel	• Coating and integrity inspection specialists with FROSIO / NACE / ASME / API certifications and familiarity with port cranes
Deliverable	• Risk-based inspection report, detailing corrosion and coating condition in specific areas mapped to GA drawings
Benefits	
• *Accurate assessment of coating condition, in specific areas mapped to GA drawings of cranes* • *Risk-based prioritisation of needed maintenance & repair*	

**UAV = Unmanned Aerial Vehicle (i.e. flying drones); NDT = Non-Destructive Testing; UT = Ultrasonic Testing (a form of NDT); MPI = Magnetic Particle Inspection (a form of NDT); GA = General Arrangement (Drawing)*

Bespoke Maintenance & Repair	
Project Management	• Full management and coordination throughout the entire project to ensure excellent surface preparation and application, minimum resource use and faster project completion • Pre-project inspection, including specification verification, staff training and equipment/coating preparation • Ongoing quality checks • Selection of most appropriate coating and maintenance solutions • Working with selected application partners
Personnel	• Full-time and dedicated project manager(s) to be stationed on-site
Deliverable	• Daily progress reports • A full report at the end of the project
Benefits	
• Maintenance & Repair which is tailored to specific issues identified during inspections • Project managed by Hempel so customers can focus on their core business • Reduced annual maintenance-related spending on steel replacement, labour and coating • Reduction of materials waste and emissions	

Revitalising a maritime icon

Titan Crane restored with Avantguard coatings and Hempel expertise

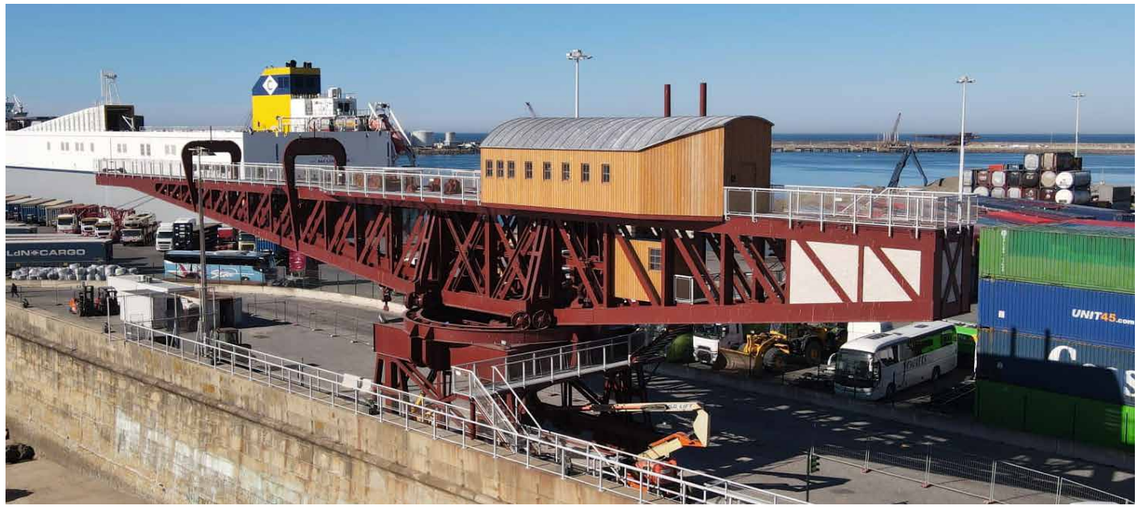
The Titan crane at the port of Leixões in Portugal has been an industrial landmark for over 130 years, standing as a symbol of maritime strength. After years of exposure to harsh coastal conditions, the crane had become unusable. In 2021, port authorities initiated a rehabilitation project, and Hempel provided a tailored integrated solution, including a coatings package based on our award-winning Avantguard activated zinc primer, technical support from our Services team in Portugal, and a long-term performance guarantee. This comprehensive approach ensures the restored crane remains corrosion-free despite the demanding marine environment.

The challenge
During the restoration, some of the original steel was reused while other sections were replaced, requiring a highly robust anti-corrosion solution for both new and rehabilitated steel. With its extreme exposure to salt and humidity, the crane needed coatings that could withstand years of environmental stress. Engineering firm Mecwide managed the project, with Vesam Group designing the structural solution and Prozinco, a long-standing Hempel customer, executing the anti-corrosive work. Prozinco's extensive experience in protecting steel against corrosion was key to ensuring the project's success.

At a glance	
Customer	Vesam Group
Sub-contractor	Prozinco
Coating system	Primer: Avantguard 750 Intermediate: Hempaprime Multi 500 Topcoat: Hempathane HS 55610

The solution
Hempel specified a complete integrated solution that combined coatings, technical service, and a performance guarantee. The Avantguard 750 zinc epoxy primer was selected due to its advanced activated zinc technology, which provides superior corrosion resistance using barrier, inhibitor, and galvanic effects. Avantguard coatings offer enhanced protection with fewer coats or reduced dry film thicknesses, improving longevity and minimising maintenance costs. Additionally, they dry faster and remain easy to apply even under variable humidity and temperature conditions.

Throughout the project, Hempel's sales and laboratory teams worked closely with Prozinco to ensure optimal coating specifications. Our Services team provided hands-on support during application, overseeing surface preparation and ensuring a high-quality finish with minimal waste and downtime. To provide added assurance, the solution includes a 25-year performance guarantee, ensuring the Titan crane will remain protected and operational for decades to come.



Selected references 2024

Project Name	Owner	Region	Type	Quantity
Maersk Los Angeles, USA	APMT	USA	STS	3
Maersk Abidjan, Côte d'Ivoire	APMT	Côte d'Ivoire	STS+RTG	2+9
Maersk Morocco	APMT	Morocco	STS	4
Maersk Barcelona	APMT	Spain	RMG+Transporter	1+4
Maersk Lazaro, Mexico	APMT	Mexico	RMG+Transporter	6+14
TIL Seayard, Marseille, France	TIL	France	RMG	1
PTP Johor Bahru, Malaysia	PTP	Malaysia	STS	5
Hanwha Shipyard, South Korea	Hanwha Shipyard	South Korea	Portal Crane	3
Hutchison Whampoa Euromax, Rotterdam, Netherlands	Hutchison Whampoa	Netherlands	STS	5
Egypt	Eurogate	Egypt	RTG	40
United Arab Emirates	UAE	United Arab Emirates	RTG	5
Turkey	PSA	Turkey	RTG	9
Kenya	Kenya	Kenya	RTG	10
Cambodia	Cambodia	Cambodia	RTG	4
Djibouti	Djibouti	Djibouti	RTG	10
Indonesia	Indonesia	Indonesia	RTG	3
Nanjing Port Jiangbeiji Project	Nanjing Port Jiangbei Container Terminal Co.	China	Portal Crane	5
Lu'anzhou Maintenance	Changzhou Lu'anzhou Yangtze River Terminal Co.	China	Maintenance	24
Tiansheng Port	Jiangsu Tiansheng Port Co.	China	Portal Crane	6
Vietnam Port	Da Nang of Vietnam	Vietnam	STS	1
Kaohsiung Port Project, Taiwan	Hyundai	Taiwan	RMG	8
Dutigorin Port Project, India	Port of Dutigrin	India	STS+RTG	3+9
Shenzhen Xiaomo Port 2STS	Guangdong Yantian Port Shenshan Port Investment Co.	China	STS	2
Shandong Port Group Yangfan Shipyard	Qingdao Yangfan Shipbuilding Co.	China	Portal Crane	2
BEDESCHI Ship Unloader Project	Qatargas Operating Compnay Co.	Qatar	Ship unloader	2
GSU2302 Huadian Kemen III Ship Unloader Project	Huadian Heavy Industry Caofeidian Equipment Co.	China	Ship unloader	2
Dongying Bucket Wheel Project	Huadian Heavy Industry Caofeidian Equipment Co.	China	Bucket wheel	4
Dongying Shiploader	Huadian Heavy Industry Caofeidian Equipment Co.	China	Shiploader	1
Hailong Wind Power 3600T Portal Crane Project	Hailong Wind Power	China	Portal Crane	1
Hailong Wind Power 3000T Portal Crane Project	Hailong Wind Power	China	Portal Crane	1
Hailong Wind Power 1200T Portal Crane Project	Hailong Wind Power	China	Portal Crane	2
Haili Wind Power 3600T Portal Crane Project	Haili Wind Power	China	Portal Crane	1
Dalian Huarui North Sea Ship Unloader Project	Guangxi Beibu Gulf Port Group	China	Ship unloader	3
Zhaoqing Port Fenkai Port Area Changgang Operation Area Public Utility Comprehensive Terminal	Zhaoqing Port Investment and Development Co.	China	Belt conveyor	1
Makou Operation Area of Tianzhen Port District, Wuxue Port	China Railway Siyuan Survey and Design Group Co., CRCC Harbour & Channel Engineering Bureau Group Co.	China	Portal Crane, Shiploader	1
Pantang Operation Area, Tianzhen Port Area of Wuxue Port	Hubei Port Group Wuxue Port Development Company	China	Portal Crane	2
Cuntan Cruise Terminal Equipment Project	Chongqing Cuntan Harbour City Development Co.	China	Terminal facility	1

A partnership that builds confidence in every project

Hempel Services supports you every step of the way — from specification and planning to application and final curing

We offer a comprehensive service that supports you at every stage of your project, from specification through to application. Our expertise in high-quality protective coatings ensures long-term safety and durability for your physical and financial assets, helping to mitigate risks in demanding environments.

By understanding the unique challenges of coating port equipment and cranes, we develop innovative solutions that enhance application efficiency and maximise durability. Our advanced coatings are engineered to withstand harsh conditions, providing superior protection and long-lasting performance.

Wherever your project is located, we bring the coating expertise to ensure your port equipment and cranes are built to last.

Visit our contact page:
services.hempel.com

Port Equipment and Cranes

> We choose Hempel coatings because we know the paint and we know the service we can expect. The coatings have a good and reliable performance in corrosion protection, and the technical services are professional, precise and globally available, providing great support. We have worked with Hempel for many years, with great success."
>
> — Kai Zhao, Project Manager ZPMC

As a world-leading supplier of trusted coating solutions, Hempel is a global company with strong values, working with customers in the decorative, marine, infrastructure and energy industries. Hempel factories, R&D centres and stock points are established in every region.

Across the globe, Hempel's paints and coatings can be found in almost every country of the world. They protect and beautify buildings, infrastructure and other assets, and play an essential role in our customers' businesses. They help minimise maintenance costs, improve aesthetics and increase energy efficiency.

At Hempel, our purpose is to shape a brighter future with sustainable coating solutions. We firmly believe that we will succeed as a business only if we place sustainability at our heart. Not only is it the right thing to do, it will strengthen our competitive position, make ourselves more resilient and reduce our risk.

Hempel was founded in Copenhagen, Denmark in 1915. It is majority owned by the Hempel Foundation, which ensures a solid economic base for the Hempel Group and supports cultural, social, humanitarian and scientific purposes around the world.

Hempel A/S
Lundtoftegaardsvej 91
2800 Kgs. Lyngby
Denmark

Tel: +45 4593 3800
Email: hempel@hempel.com

V2_MAY_25