

Civil structures

Global experience
and trusted solutions



World-leading coatings supplier

Hempel was founded in 1915 and is today one of the world's leading manufacturers and suppliers of coating solutions. Our advanced protective and decorative coatings can be found on millions of surfaces around the globe.

From the world's longest bridges and tallest skyscrapers to airports, sports stadia and civil structures our coatings protect your assets against corrosion in many different and challenging environments.

Our history is rooted in protective coatings for the extreme conditions experienced in the Marine, Decorative and Protective industries, so you can be assured that we offer trusted technology, expert technical service and reliability.

With our vast expertise and knowledge, you know that by choosing Hempel, you are choosing a brand you can trust.

Tailored for civil structures

Tailored coatings solutions

Our range of high performance protective and decorative coatings are designed to protect civil structures in many ways.

Our coatings have been developed using advanced technologies to ensure they are effective, durable and retain their good looks. They can be trusted as part of your ongoing maintenance programme and can extend intervals between recoating.

We offer tailored systems to address:

- abrasion and corrosion resistance
- weather resistance
- good gloss and colour retention
- easy to clean and maintain
- fire protection properties

Technical support

Our customers receive the exact application advice for their project and conditions from our 600+ FROSIO/NACE certified coating advisors around the world.

We analyse your project for specific requirements and our experienced Technical Service Teams deliver systems that will protect against changing temperatures and humidity, to the ageing of the structure and the threat of fire, whilst ensuring every application procedure is as fast and efficient as possible.

Our coating ranges include:

- Strata floor coatings, designed to protect concrete floors in heavy-duty, heavy traffic areas
- Contex concrete protection system, ideally suited for buildings, roads, bridges, bypasses and tunnels, offering superior protection from weathering, carbonation and structure movements
- Avantguard®, the activated zinc technology locked in to our Hempadur range of coatings giving you advanced corrosion protection
- Hempacore® intumescent coatings for passive fire protection, proven to give you consistent, durable and efficient results

Our coatings meet the most stringent global standards, so you can specify Hempel with confidence whatever your transportation centre coating needs.



Global service

We want to give you the right products on site, on time, every time. With the support of our 28 manufacturing plants and over 150 stock points worldwide, we offer a flexible service to all our customers. A service that we believe is second to none.

Proven performance

Our range of high performance protective coatings offer advanced protection and optimised application for a durable finish that looks good for longer, in even the most challenging climates. With a proven track record, we are a trusted protective coatings partner for our customers in the construction industry around the world.

Professional support

Our customers know that specifying the right products is crucial when designing structures, to ensure corrosion and fire protection, good appearance and minimum maintenance. Our multinational, globally based teams are uniquely positioned to ensure the smooth running of your project. From planning to completion, specification to application, we have key people to support you both off and on site.

Innovative solutions

With 15 global research and development facilities, we work locally with you to provide the right solution for your project. Our research and development teams are committed to continuous development of innovative and effective speciality coatings to give you durable protection whilst ensuring environmental responsibilities are met.

Avantguard®

Superior corrosion protection

Here at Hempel, we strive to develop coatings that are ever stronger to protect our customers' assets around the world against the corrosive effects of industry and nature alike.

Avantguard is our innovative, award winning¹ anti-corrosion technology, based on activated zinc. Our patented Hempadur Avantguard coatings have been proven to deliver superior corrosion protection compared to competitor zinc rich epoxy products².

Avantguard technology uses a new combination of zinc, hollow glass spheres and a proprietary activator. This activates the zinc, increasing its protective capabilities.

Improves full systems

Strengthening the system at its core, Avantguard gives the full coating system enhanced corrosion performance.

Redefines protection

Avantguard shows superior anti-corrosive performance in salt spray tests (ISO 12944-6)², as well as reduced rust creep and better corrosion protection in cyclic corrosion testing (ISO 12944:2018 Part 9) and NORSOK M501 revision 6.

Redefines durability

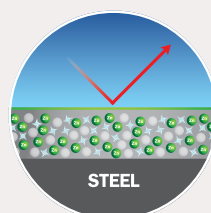
Avantguard displays improved mechanical strength in the protective coating with significantly improved crack resistance. The NACE cracking test (Thermal Cycling Resistance test) and Hempel's welding test have proved that Avantguard substantially reduces cracking at both low and high DFT.

Redefines productivity

Avantguard is fast drying with best-in-class³ overcoating intervals. The products are easy to apply, even in high temperatures and humidity as shown in exposure tests. There is less rework due to cracking, as the coating is more tolerant, even with high DFTs.

These activated zinc primers reduce the effects of corrosion, offering advanced protection and increased durability for all-round performance. Unlike standard zinc epoxies, Avantguard is effective using all three methods of anti-corrosive protection.

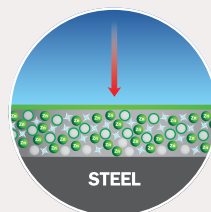
Barrier



Improved barrier properties

Avantguard displays low water permeability. The salts produced by the unique zinc activation process fill any space within the film, sealing it and enhancing the barrier properties of the coating.

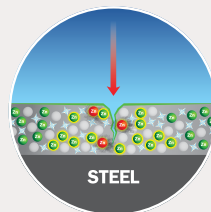
Inhibitor



Inhibition effect for improved protection

The zinc salts formed contain high levels of chloride ions that are captured as they are diffused from the environment through the film. This reduces the concentration of corrosive agents that reach the steel surface.

Galvanic



Activated zinc gives excellent anti-corrosive properties

In the presence of oxygen, water and salt, zinc reacts faster than steel. This delays the corrosion process for much longer.

"Avantguard has a self-healing effect on micro cracks, which is something that we've never seen before. The insoluble salts which are created in the unique zinc activation process actually occupy the space left by the microcrack, further preventing the development of a more serious crack."

Josep Palasi
Hempel Strategic Technology Director

1. Avantguard won the prestigious 2014 European Frost & Sullivan Award for New Product Innovation and NACE's MP Corrosion Innovation of the Year Award 2105.
2. This superiority has been independently proven by third party laboratory neutral salt spray tests according to ISO 9227. In this test, steel protected with Avantguard produced a lower evolution of rust creep, assessed according to ISO 12944-6, when tested up to 3x the duration for C5 high environments.
3. Avantguard's overcoating interval is a minimum of 33% faster than competitor zinc-rich epoxies when comparing product data sheets.

Hempadur Avantguard 550

Anti-corrosive performance in compliance with ISO 12944 C5 high, which is fast curing and easy to apply.

Complies with the requirements for Level 3, type II in SSPC Paint 20, 2002.

Utilises ASTM D520, type II zinc dust.

Hempadur Avantguard 750

Anti-corrosive performance in compliance with NORSOK M-501 which is faster curing, easy to apply and retains it's properties even at excessive application.

Complies with NORSOK M-501 Ed. 6 (ISO 12944:2018 Part 9) and Level 2, type II in SSPC Paint 20, 2002.

Utilises ASTM D520, type II zinc dust.

The Louvre Museum

Abu Dhabi, United Arab Emirates

The innovative Louvre Abu Dhabi building, designed by Pritzker Prize-winning architect Jean Nouvel, combines modern architecture and inspiration drawn from the region's traditions, the design reflects the desire to create a universal museum in which all cultures are brought together.

8,000 tonnes of steelwork that form the domed roof needed protection against the corrosive salts from the sea of the Persian Gulf and the natural climate of Saadiyat Island.

For this project our customer chose a combination of our protective coatings to ensure the most durable and aesthetic finish for this striking structure.

| Products |
|-------------------------|
| Hempel's Galvosil 15700 |
| Hempadur Mastic 45881 |
| Hempathane 55910 |



Tornado Tower, Doha, Qatar

The Tornado Tower is located in the thriving West Bay business district of Doha, Qatar. The impressive building is 200 metres tall and offers 58,000 square metres of world-class office space on 52 floors. Tornado Tower sets new standards both inside and out, with Hempel supplying the protective coatings.



| Products |
|-----------------------------|
| Topaz emulsions 588ME/589ME |
| Hempadur Mastic 45881 |

Copenhagen Opera House, Copenhagen, Denmark

One of the most modern and expensive opera houses in the world, Denmark's national opera house was constructed using limestone, glass and steel. A characteristic feature of the building is the giant roof, which has a cantilevered design and covers an impressive 158 metres x 90 metres, the size of three football fields.



| Products |
|---------------------|
| Epoxy Primer |
| Hempacore 43600 |
| Hempathane HS 55810 |

Kuwait Trade Centre, Kuwait City, Kuwait

The Kuwait Trade Centre stands on an almost square podium base and rises to a pointed peak, 218 metres above ground. The design consists of a cylindrical shaped concrete central core around which the steel floor plates are arranged and orientated to create a twisting tower. Hempel is the chosen coating supplier for ongoing maintenance.



| Products |
|-------------------------|
| Hempadur Zinc 17360 |
| Hempadur Mastic 45880 |
| Hempaxane Classic 55000 |

Strata

Ultimate protection for floors

Offering best-in-class abrasion resistance and mechanical strength, it has been developed to reduce the need for cyclical maintenance whilst offering high standards in sustainability. Strata products are ideal for demanding applications and total solutions.

Strata Epoxy HT

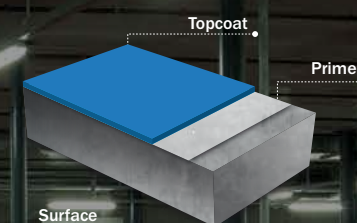
High-build two component solvent free epoxy floor coating for heavy traffic purpose.

Special features

- Outstanding mechanical properties
- High abrasion and chemical resistance
- Low odour
- Smooth glossy or slip-resistant surface
- Available in a wide range of colours

Areas of use

Designed to protect concrete substrates in heavy-duty areas such as factories, manufacturing, warehousing, airfield workshops, food production, medical laboratories and car parks with heavy traffic. It is suitable for areas like ramps, turning circles, parking lots, and areas with heavy forklift traffic in particular.



Certificates/approvals:

| Property | Standard | Result |
|----------------------|---------------|-----------------------|
| Adhesion strength | ASTM D4541-09 | 4.7 N/mm ² |
| Tensile strength | ASTM C307-03 | 20 N/mm ² |
| Flexural strength | ASTM C580-02 | 39 N/mm ² |
| Compressive strength | ASTM C579-01 | 89 N/mm ² |
| Abrasion resistance | ASTM D4060-10 | 60 mg/1000 cycles |
| Impact resistance | ASTM D2794 | 0.3 kg-m |
| Shore D hardness | ASTM D2240-05 | D/79/1 |

| Chemical resistance | Method | Result |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------|
| Distillated water (cold) Distillated water (hot) Ethyl Alcohol (50% vol) Vinegar (3% acetic acid) Alkali solution (5%) Soap solution Detergent solution | ASTM D1308 | No discolouration, change in gloss, blistering, softening, swelling, loss of adhesion or special phenomena was observed. |

Strata Epoxy SL2000

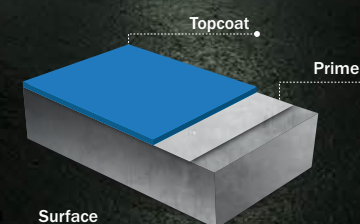
Strata Epoxy SL 2000 is a self-smoothing, solvent-free, three-component epoxy floor coating.

Special features

- Self-smoothing, seamless surface
- From 1 to 3mm DFT
- Excellent abrasion and impact resistance
- Excellent chemical resistance
- Available in a wide range of colours

Areas of use

Designed to protect concrete substrates where a seamless flooring surface combined with excellent mechanical properties is essential. It is ideal for areas where hygiene is vital such as hospitals. It can be applied up to 3mm DFT depending on the specification.



Certificates/approvals:

| Property | Standard | Result |
|----------------------|---------------|-----------------------|
| Adhesion strength | ASTM D4541-09 | 4.8 N/mm ² |
| Tensile strength | ASTM C307-03 | 19 N/mm ² |
| Flexural strength | ASTM C580-02 | 42 N/mm ² |
| Compressive strength | ASTM C579-01 | 84 N/mm ² |
| Abrasion resistance | ASTM D4060-10 | 59 mg/1000 cycles |
| Impact resistance | ASTM D2794 | 0.4 kg-m |
| Shore D hardness | ASTM D2240-05 | D/83/1 |

| Chemical resistance | Method | Result |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------|
| Distillated water (cold) Distillated water (hot) Ethyl Alcohol (50% vol) Alkali solution (5%) Soap solution Detergent solution | ASTM D1308 | No discolouration, change in gloss, blistering, softening, swelling, loss of adhesion or special phenomena was observed. |

Hempacore

Intumescent coatings for passive fire protection

The core of fire protection

The intumescent coatings of our Hempacore range offer passive fire protection that lengthens the time a steel structure will remain intact during a fire. They provide longer evacuation times and allow emergency personnel more time to respond. That means that these advanced coatings solutions not only help to protect investments, but can potentially save lives.

Hempacore provides passive fire protection up to 150 min of cellulosic fire. Manufactured using high-quality raw materials, they give a high performance with low dry film thickness and fast drying times. We also offer coatings suitable for both on site and in shop applications.

Hempacore has you covered

Our Hempacore range helps to protect structural steel both inside and out including:

- industrial halls
- public buildings
- stadiums
- exhibition halls
- airports
- railway stations
- supermarkets

Full system supplier

We have a broad range of primers and topcoats that are approved for use with Hempacore, giving us the flexibility to tailor-make a coating solution to fit any project. Having one supplier makes it easier for you to get the ideal coatings combinations, and you are assured that they are fully compatible.

Excellent application properties

Hempacore is designed with the applicator in mind.

- Competitive loadings give good fire protection performance at low DFT's
- High maximum dry film thickness per coat
- Wide application window to enable great working flexibility
- Easy application across wide temperature range
- Fast drying products
- Durable coatings that are less sensitive towards weather and potential damage during transportation and construction
- Products with a wide range of approvals to help you to minimise stock levels

Engineering support

Our specialists are ready to support your project from the initial stages. Just provide us with the project data and we will use our own dedicated specification software to propose the right solution for you. Our specialists ensure all factors are taken into account, such as the required fire protection properties, the architecture of the structure, profile types, application techniques, transport methods, local weather conditions, legislation, aesthetic and economic aspects of the whole project.

Long lasting protection and aesthetic appearance

Not only do you benefit from high corrosion resistance and passive fire protection, but you also achieve your desired decorative effect. Using our tailor-made coating combinations you can have a smooth and tough finish in any shade with excellent colour and gloss retention.

You can count on us

Tested for fire, weather and application

All Hempacore coatings are tested extensively at our dedicated fire protection research and development facilities. The fire protection performance is tested for up to 2 hours under turbulent conditions, where the fire temperature is over 1000°C.

In addition, we make sure that on site conditions and the effects of weather will never compromise the level of fire protection the coating provides. Real-life scenarios are simulated by testing weathered coating systems and profile sections that have loads applied. For weather durability we test the products in cycles with extreme temperature shocks across the range -20°C to +70°C, and where the relative humidity reaches up to 95 per cent (+/-5 per cent). Application properties are also tested in a broad range of climatic conditions.

Certifications and approvals

With the Hempacore intumescent range, you get coatings with a very wide scope of both international and local approvals.

The global approvals include:

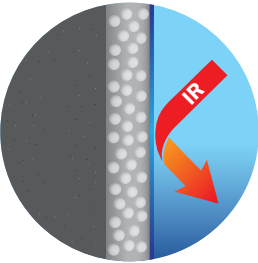
- BS 476-21
- EN 13381-8
- GB 14907
- GOST 53295
- AS1530.4

For more information, please contact your local Hempel office.

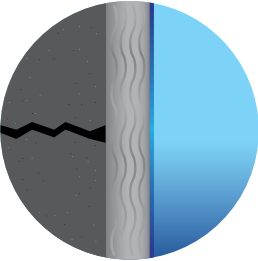
Contex

Protective exterior coatings

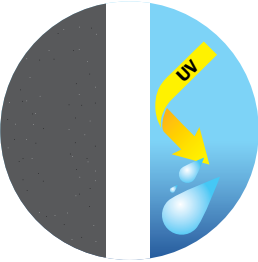
Tough climates require tough protection. Our Contex range uses advanced technology to deflect solar rays, reduce heat conductivity, protect against carbonation and enhance crack bridging. Ideally suited for buildings, roads and bridges, it is available in a variety of finishes and textures that prolong the life of concrete surfaces.



| Product | Benefits |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contex Thermoguard Contex Thermoguard is a multifunctional waterborne topcoat designed to reflect near infrared radiation to provide thermal insulation and extreme long lasting colours in hot climates. It is based upon advanced heat-reflective pigments and 100% pure acrylic technology to ensure maximum performance in harsh climates. | Reduce indoor air temperature with up to 5°C Reduced façade maintenance due to very long lifetime Reduce Urban Heat island effect Protect the surface from carbonation |



| Product | Benefits |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Contex EM Contex EM is waterborne elastomeric topcoat with outstanding dynamic and static crack bridging properties to accommodate structure movements. It is based on 100% pure acrylic binders and provide effective protection against harsh climatic conditions. The breathable smooth textured surface offers brilliant anti-carbonation properties. | Outstanding crack bridging properties Excellent anti-carbonation properties Excellent UV resistance Exceptional weathering resistance |



| Product | Benefits |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contex Topcoats Contex topcoats are known for their outstanding colour retention, allowing exterior walls to maintain their appearance even in the hottest climates. They are available in both waterborne and solvent-borne versions to serve different needs and requirements. Contex topcoats have three different sheens: Matt, Silk, Semi-gloss. | Outstanding weather resistance Excellent UV resistance Proven colours retention and opacity properties Excellent anti-carbonation properties |

Jaber Al Ahmad Al Jaber Sabah Hospital

Kuwait

This is the largest medical centre in the state of Kuwait. A hospital that provides 1,168 beds together with state of the art medical services to a projected population of 600,000. The hospital will be keeping with the Kuwait Ministry of Health's long-term strategy to provide the highest quality of health care to the people of Kuwait.

| Products |
|----------------------------|
| Contex EM 58600 |
| Strata Epoxy WB 48560 |
| Topaz Zero Emulsions 58701 |



The National Museum of Qatar

Doha, Qatar

We were delighted to be appointed as the trusted supplier for this prestigious project.

Zero VOC was a prominent requirement of the specification and Topaz Zero emulsions, with their additional benefits of being hazard free and environmentally friendly, met the client’s needs exactly.

With over 30,000 litres used on this project, the client can rest assured that his sustainable responsibilities have been met.

Additionally our client benefited from our attentive and consistent service from initial enquiry through to project completion.



| Products |
|-----------------------------|
| Topaz emulsions 588ME/589ME |
| Strata Epoxy HT 35590 |

Dongguan Commercial Assembly Hall

Taiwan

Dongguan Taiwan Commercial Assembly Hall is an iconic building standing 289 metres high and epitomises Taiwan culture. This is the first Taiwan Commercial Assembly Hall built in the mainland city and is located on Dongguan Avenue in the centre of Dongguan City. It covers a ground area of more than 30,000 square metres, and the total construction area is 220,000 square metres, with more than 90 floors.



| Products |
|--------------------------|
| Hempadur Zinc 15360 |
| Hempadur Mastic 45880 |
| Hempathane Topcoat 55210 |

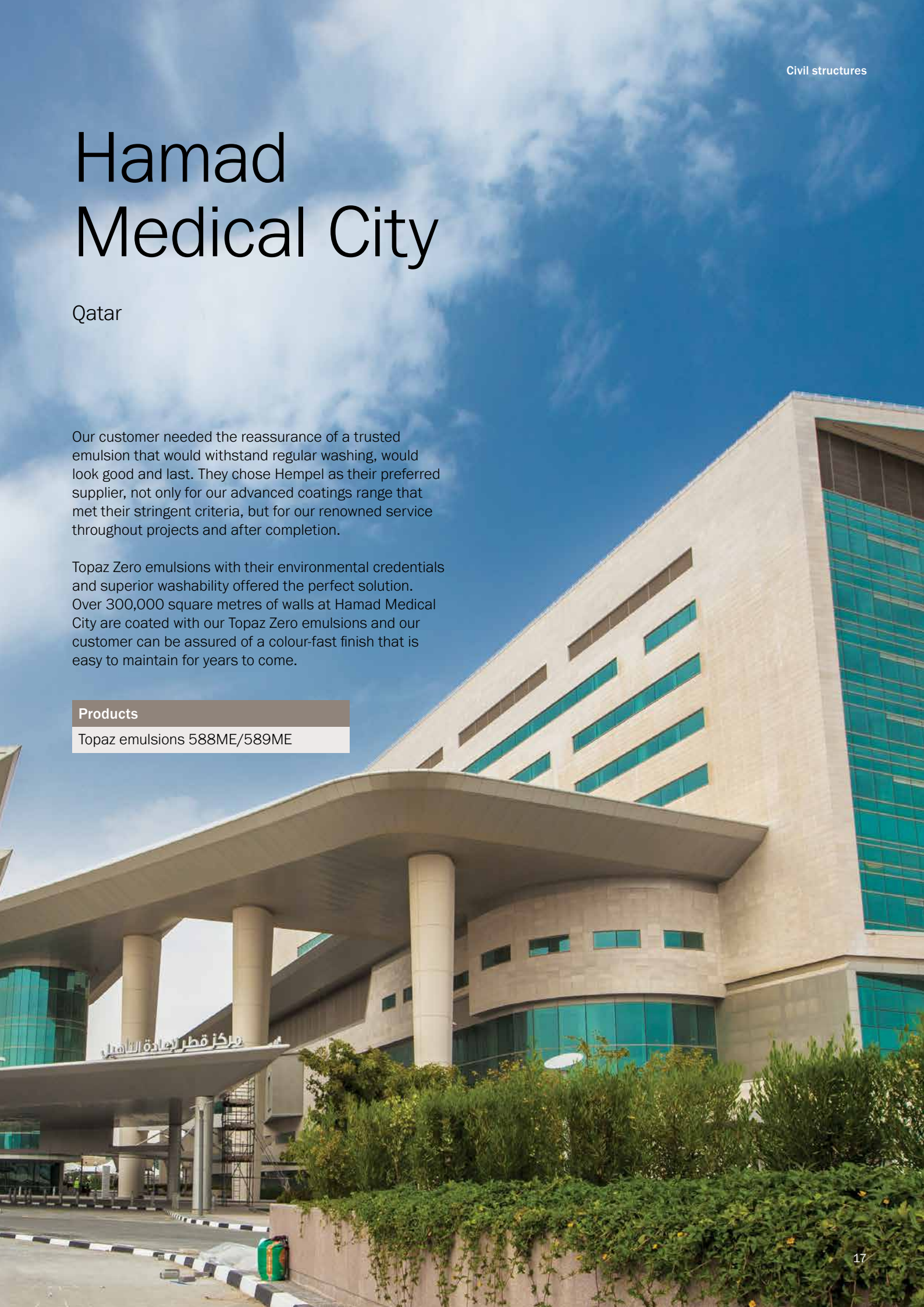
Hamad Medical City

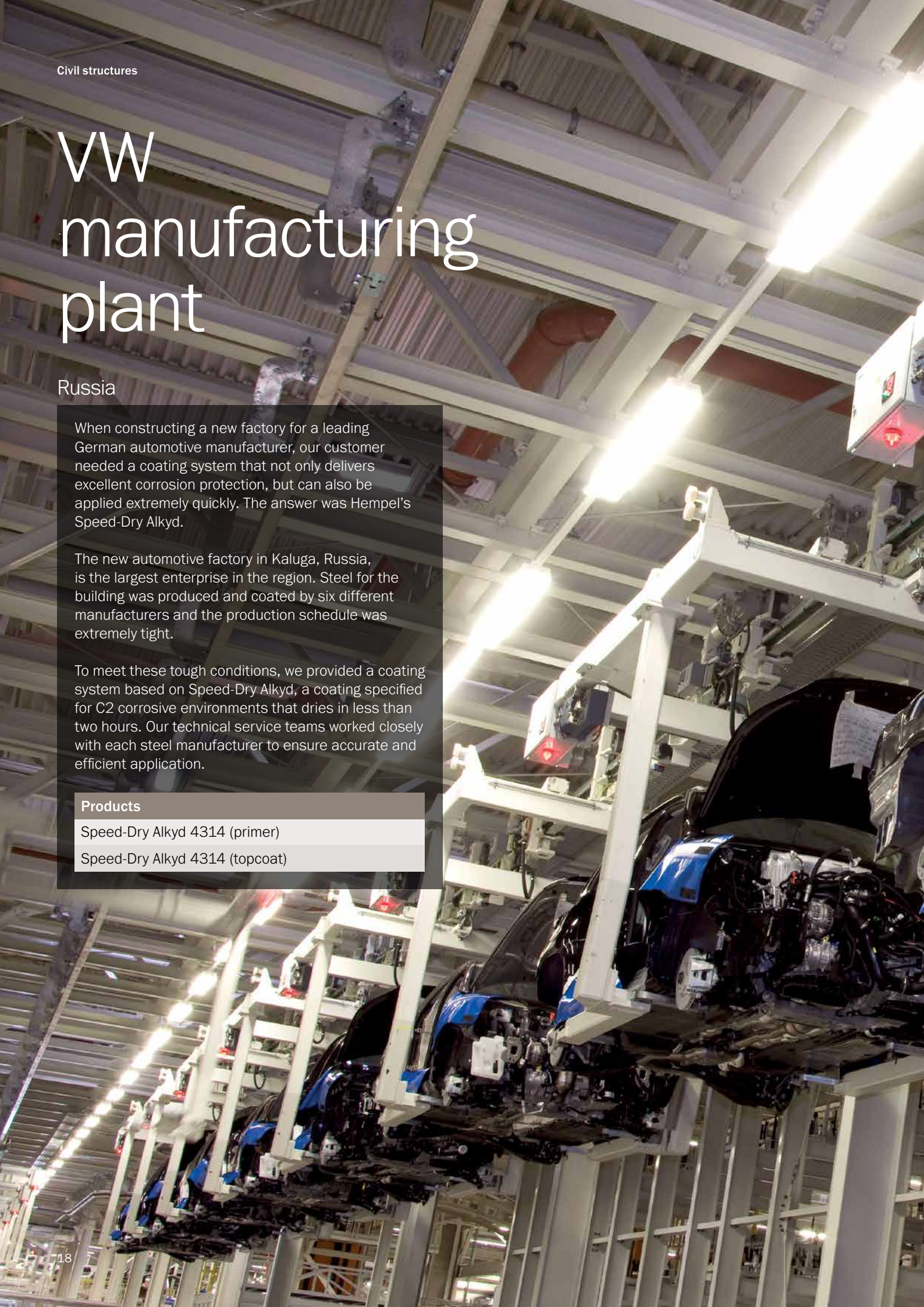
Qatar

Our customer needed the reassurance of a trusted emulsion that would withstand regular washing, would look good and last. They chose Hempel as their preferred supplier, not only for our advanced coatings range that met their stringent criteria, but for our renowned service throughout projects and after completion.

Topaz Zero emulsions with their environmental credentials and superior washability offered the perfect solution. Over 300,000 square metres of walls at Hamad Medical City are coated with our Topaz Zero emulsions and our customer can be assured of a colour-fast finish that is easy to maintain for years to come.

| Products |
|-----------------------------|
| Topaz emulsions 588ME/589ME |





VW manufacturing plant

Russia

When constructing a new factory for a leading German automotive manufacturer, our customer needed a coating system that not only delivers excellent corrosion protection, but can also be applied extremely quickly. The answer was Hempel's Speed-Dry Alkyd.

The new automotive factory in Kaluga, Russia, is the largest enterprise in the region. Steel for the building was produced and coated by six different manufacturers and the production schedule was extremely tight.

To meet these tough conditions, we provided a coating system based on Speed-Dry Alkyd, a coating specified for C2 corrosive environments that dries in less than two hours. Our technical service teams worked closely with each steel manufacturer to ensure accurate and efficient application.

Products

Speed-Dry Alkyd 4314 (primer)

Speed-Dry Alkyd 4314 (topcoat)

Selected references

| Project | Location | Products | Year |
|----------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------|-----------|
| Sabah Al Salem Sports Hall | Kuwait, Middle East | Casa Stone Tex 582ME, Topaz 588ME | 2016 |
| Vigo AVE Railway Station | Vigo, Spain | Hempacore One 43600 | 2015 |
| VW Plant | Kaluga, Russia | Speed-Dry Alkyd 4314 (primer), Speed-Dry Alkyd 4314 (topcoat) | 2015 |
| Audi Plant, San Jose Chiapa | Puebla, Mexico | Hempalin Enamel 52140, Hempadur Fast Dry 17410, Hempacore One 43600, Hempacore One FD 43601, Hempadur Mastic 45881 | 2015 |
| Singapore University of Technology & Design (SUTD) | Singapore | Hempadur Mastic 45881, Hempathane Topcoat 55210 | 2014 |
| Torun Sports Hall | Torun, Poland | Hempadur Fast Dry 17410, Hempadur Mastic 45880, Hempacore FD 43601, Hempatex Hi-Build 46410 | 2014 |
| Arena do Grêmioe | Portro Alegre, Brazil | Hempadur Zinc 17360, Hempadur Fast Dry 15560, Hempathane HS 55610 | 2014 |
| Kunming New International Airport | Yunnan Province, China | Hempadur Mastic 45880, Hempaxane Classic 55000 | 2009-2012 |
| Fuzhou Exhibition Hall | Fujian Province, China | Hempel's Galvosil 15700, Hempel's Mastic Epoxy Paint 4588P, Hempathane Topcoat 55910 | 2008-2010 |
| Beijing International Airport | Beijing, China | Hempaxane Classic 55000, Hempadur Zinc 17360, Hempadur Mastic 45880 | 2008 |
| Copenhagen Opera House | Copenhagen, Denmark | Hempel's Shopprimer E 1528, Hempadur 4714, Hempathane Topcoat 55210 | 2003-2004 |

About Hempel

As a world-leading supplier of trusted coating solutions, Hempel is a global company with strong values, working with customers in the protective, marine, decorative, container and yacht industries. Hempel employs 6,700 people in 80 countries and has 28 factories, 15 R&D centres and more than 150 stock points worldwide.

Across the globe, Hempel's coatings protect surfaces, structures and equipment. They extend asset lifetimes, reduce maintenance costs and make homes and workplaces safer and more colourful. Hempel was founded in Copenhagen, Denmark in 1915. It is proudly 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

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