

# Bridges

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 bridges

Bridges are essential in bringing people together. They span land, rivers and even the seas. Made from concrete and steel, bridges require tailored protective coatings to ensure they are resistant to weather, climate and the pollution caused by continual traffic.

Whether huge and breathtaking or functional and unassuming, bridges are essential to keep us connected. This is why we have designed our range of high performance, anti-corrosion systems to provide an advanced, durable, hard working and good looking finish to reduce maintenance and keep people on the move.

Whatever the challenge of your project, we have the right corrosion protection to meet your specific needs and offer on and off site technical support that makes a real difference to you.



## 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 bridges, to ensure corrosion 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.

# Contex EM

## Elastomeric coating for outstanding protection

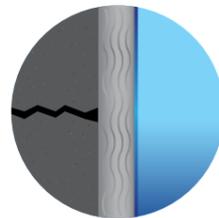
Tough climates require tough protection. Our Contex range uses advanced technology to deflect solar rays, protect against carbonation and enhance crack bridging.

### Benefits

- Outstanding crack bridging properties
- Excellent anti-carbonation properties
- Excellent UV resistance
- Exceptional weathering resistance

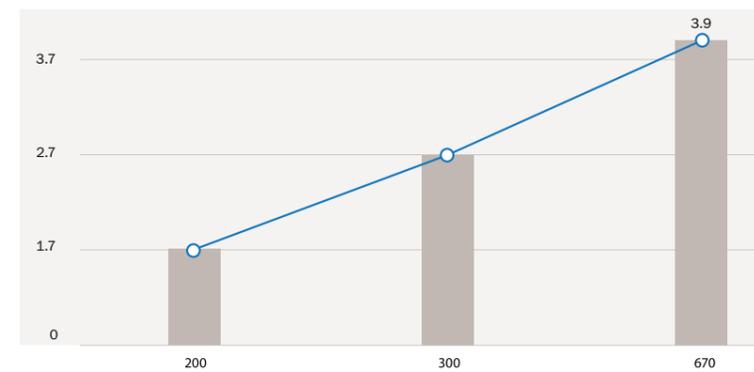
Contex EM is ideally suited for bridges, roads, by-passes and tunnels, it is available in a variety of finishes and textures that prolong the life of concrete surfaces.

Contex EM is a waterborne elastomeric topcoat with outstanding dynamic and static crack bridging properties to accommodate structure movements. Based on 100 per cent pure acrylic binders it provides effective protection against harsh climatic conditions. The breathable smooth textured surface offers brilliant anti-carbonation properties.



Flexible formulation for outstanding crack bridging

Crack bridging in mm



Dry film thickness in microns

The graph shows that the increase of Contex EM thickness can bridge wider cracks.

Certification
BSEN 7-1062 Crack bridging
BSEN 6-1062 Carbon dioxide diffusion resistance

# 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 winning<sup>1</sup> 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 products<sup>2</sup>.

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)<sup>2</sup>, 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

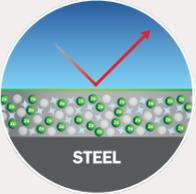
Avantguard displays improved mechanical strength in the protective coating with significantly improved crack resistance. The NACE cracking test (Thermal Cycling Resistance test) and Hempel's welding test have proved that Avantguard substantially reduces cracking at both low and high DFT.

### Redefines productivity

Avantguard is fast drying with best-in-class<sup>3</sup> 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.

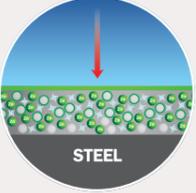
These activated zinc primers reduce the effects of corrosion, offering advanced protection and increased durability for all-round performance. Unlike standard zinc epoxies, Avantguard is effective using all three methods of anti-corrosive protection.

1. Avantguard won the prestigious 2014 European Frost & Sullivan Award for New Product Innovation and NACE's MP Corrosion Innovation of the Year Award 2015.  
 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.



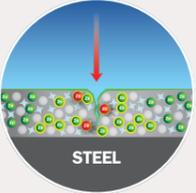
**Barrier**

**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

## Hempadur Avantguard 550

Anti-corrosive performance in compliance with ISO 12944 C5 high, which is faster 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.

Parameters	
DFT range (min and max)	50 - 100 micron
Curing time - dry to handle (20-25°C)	1 hour 30 mins
VS%	65
VOC (g/L)	319
Pot life (20°C)	3 hours
Min. overcoating intervals with epoxy (20°C)	1 hour
Application equipment	Airless spray, air spray, brush

## Hempadur Avantguard 750

Anti-corrosive performance in compliance with NORSOK M-501 which is faster curing, easy to apply and retains its 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.

Parameters	
DFT range (min and max)	50 - 100 micron
Curing time - dry to handle (20-25°C)	1 hour 30 mins
VS%	65
VOC (g/L)	316
Pot life (20°C)	4 hours
Min. overcoating intervals with epoxy (20°C)	1 hour
Application equipment	Airless spray, air spray, brush

# First Ring Road

Kuwait

By using a network of new at-grade roads, depressed roads in troughs and tunnels, elevated roads and bridges, the first phase of the First Kuwait Ring Road project will significantly improve access to downtown Kuwait City while reducing traffic congestion.

To ensure the Ring Road is protected with leading technology coatings, the bridge has been coated with over 80,000 litres of Contex EM, providing exceptional flexibility, excellent crack bridging and anti-carbonation properties.

**Products**

Contex EM 58600



**Tower Bridge, London UK**

After a four-year face-lift, historic Tower Bridge looks resplendent again in its familiar blue and white colours. Coated with 22,000 litres of our advanced protective coatings, this iconic bridge will resist London's harsh city environment and continue to display its true colours for at least the next 25 years.

**Products**

Hempaxane Classic 55000

Hempathane HS 55610

Hempadur Mastic 45880



**Nanjing Bridge, China**

Being the 6th largest suspension bridge in the world the Nanjing Bridge required over 400,000 litres of Hempel protective coatings. With a length of over 28km and a span of 5.448km crossing the Yangtze River, the bridge carries the G42 Shanghai-Chengdu Expressway.

**Products**

Hempel's Galvosil 15700

Hempadur Sealer 05990

Hempadur MIO 45670

Hempathane Topcoat 55210



**Trinec – Baliny Road Bridge, Czech**

Built as part of the Trinec City Bypass, the Trinec - Baliny road bridge is one of three bridges protected with our high performance, anti-corrosion coatings.

Our proven products meet international, and more importantly, local approvals, so our customer is assured of long term durability. And, with our local service, ensuring optimised application, the customer benefits from real cost effective solutions.

**Products**

Hempadur Zinc 17360

Hempadur Fast Dry 17410

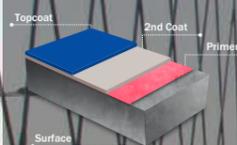
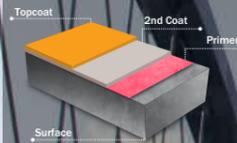
Hempathane HS 55610



# Protective systems for bridges

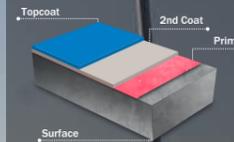
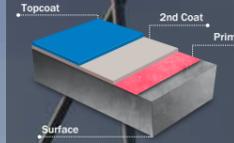
## 1.1. New metal structures (high durability systems)

	System	DFT (µm)	Recommended use	Finish	Volume solids %	VOC (g/L)	Dry to touch (20°C)
<b>Premium C5I-H system exterior coatings &gt;15 years</b>	Hempel's Galvosil 15700	60	As a versatile primer for long-term protection of steel in severely corrosive environments.	Flat	65 ± 1	315	30 mins
	Hempadur Mastic 45880/1	200	Self primed, surface tolerant paint system or as an intermediate or finishing coat in heavy duty paint systems where low VOC and high film build are required.	Semi gloss	80 ± 1	216	3 hours
	Hempaxane Light 55030	60	As a VOC-compliant, high-build finishing coat for protection of structural steel in severely corrosive environment.	Glossy	67 ± 1	336	5 hours
<b>High quality C5I-H system exterior coatings &gt;15 years</b>	Hempadur Avantguard 750	60	As a versatile primer for long-term protection of steel in severely corrosive environments.	Flat	65 ± 1	318	10 mins
	Hempadur Mastic 45880/1	200	Self primed, surface tolerant paint system or as an intermediate or finishing coat in heavy duty paint systems where low VOC and high film build are required.	Semi gloss	80 ± 1	216	3 hours
	Hempathane HS 55610	60	As a VOC-compliant, high-build finishing coat for protection of structural steel in severely corrosive environment.	Glossy	67 ± 1	336	3 hours



## 2. Concrete structures

	System	DFT (µm)	Recommended use	Finish	Volume solids %	VOC (g/L)	Dry to touch (20°C)
<b>Exterior coatings</b>	Contex Siloxane Acrylic Primer 06300	N.R.	A water repellent, well penetrating, clear siloxane acrylic primer/sealer, developed for use in Hempel's Contex anti-carbonation systems.	Slight sheen	15 ± 2	678	1 hour
	Contex EM 58600	2 x 150	An elastomeric, breathable topcoat offering anti-carbonation properties, based on high quality pure acrylic binder offering excellent flexibility and crack bridging properties.	Silk	42 ± 2	48	2 hours
<b>Exterior coatings</b>	Contex SB Primer 26600	1 x 30	An alkali resistant, acrylic solvent-borne primer/sealer especially developed for use in Hempel's Contex anti-carbonation systems.	Matt	32 ± 2	558	2 hours
	Contex Smooth 46600	2 x 150	An alkali resistant, acrylic, solvent-borne topcoat in Contex anti-carbonation system.	Matt	35 ± 2	565	2 hours



The physical constants stated are nominal data according to the Hempel Group's approved formulas. Coating shades are according to Hempel assortment list.

With regards to corrosion category for maintenance (1.2) and concrete (2) coating systems, follow the recommendations below:

When a repair is done it can be done in two ways:

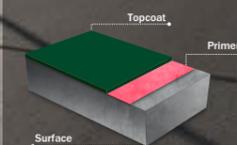
a. The old paint is completely removed back to the steel and a new system is applied. In this case the system will correspond to a new full system (new building).

b. The old paint system is partially intact - e.g. if a customer wants to apply a new topcoat and the underlying old epoxy coat is still present. In this case a full system (old + new paint) should be considered, in order to access what corrosion category the system is fit for.

Note: shown examples are based on the recommendation of ISO 12944 but other specifications can be provided if required.

## 1.2. Maintenance of metal structures

	System	DFT (µm)	Recommended use	Finish	Volume solids %	VOC (g/L)	Dry to touch (20°C)
<b>Exterior coatings</b>	Hempathane Topcoat 55210	50	Finishing polyurethane coat for protection of structural steel in severely corrosive atmospheric environments.	Glossy	51 ± 1	442	1 hour
	Hempadur Mastic 45880/1	150	Self primed, surface tolerant epoxy paint system or as an intermediate or finishing coat in heavy duty paint systems.	Semi gloss	80 ± 1	217	3 hours



**Railway Bridges, Romania**

A rail connection between Greece and Germany, the Pan-European Corridor IV is one of the most important transport corridors in Europe. Parts of the new-build steel bridges have been protected by an advanced Hempel coating system that delivers high application efficiency and long-term corrosion protection. Steel production company Energosteel Art, wanted a system with low dry film thickness (DFT), as this would reduce time, costs and waste during application. Our Avantguard solution delivered on all counts.



Products
Hempadur Avantguard 750
Hempathane HS 55610

**Jiangyin Yangtze River Bridge**

Jiangyin Yangtze bridge is a cable-stayed bridge totalling 1,806m in length and with a main span of 818m making it number seven in the top ten of the world's largest cable-stayed bridges. Coverage required over 300,000 litres of Hempel protective coatings.



Products
Hempadur Zinc 17360
Hempadur Epoxy 45150
Hempel's Fluorcarbon 555CN

**Mekkah Metro, Kingdom of Saudi Arabia**

The Mekkah Metro C-Line will be part of a 4-line transport system capable of carrying 72,000 passengers per hour and stations will capture the unique fusion between the ultra-modern technology of the metro system and the historical richness of Mekkah itself.



Products
Contex EM 58600

# Stonecutters Bridge

## Hong Kong

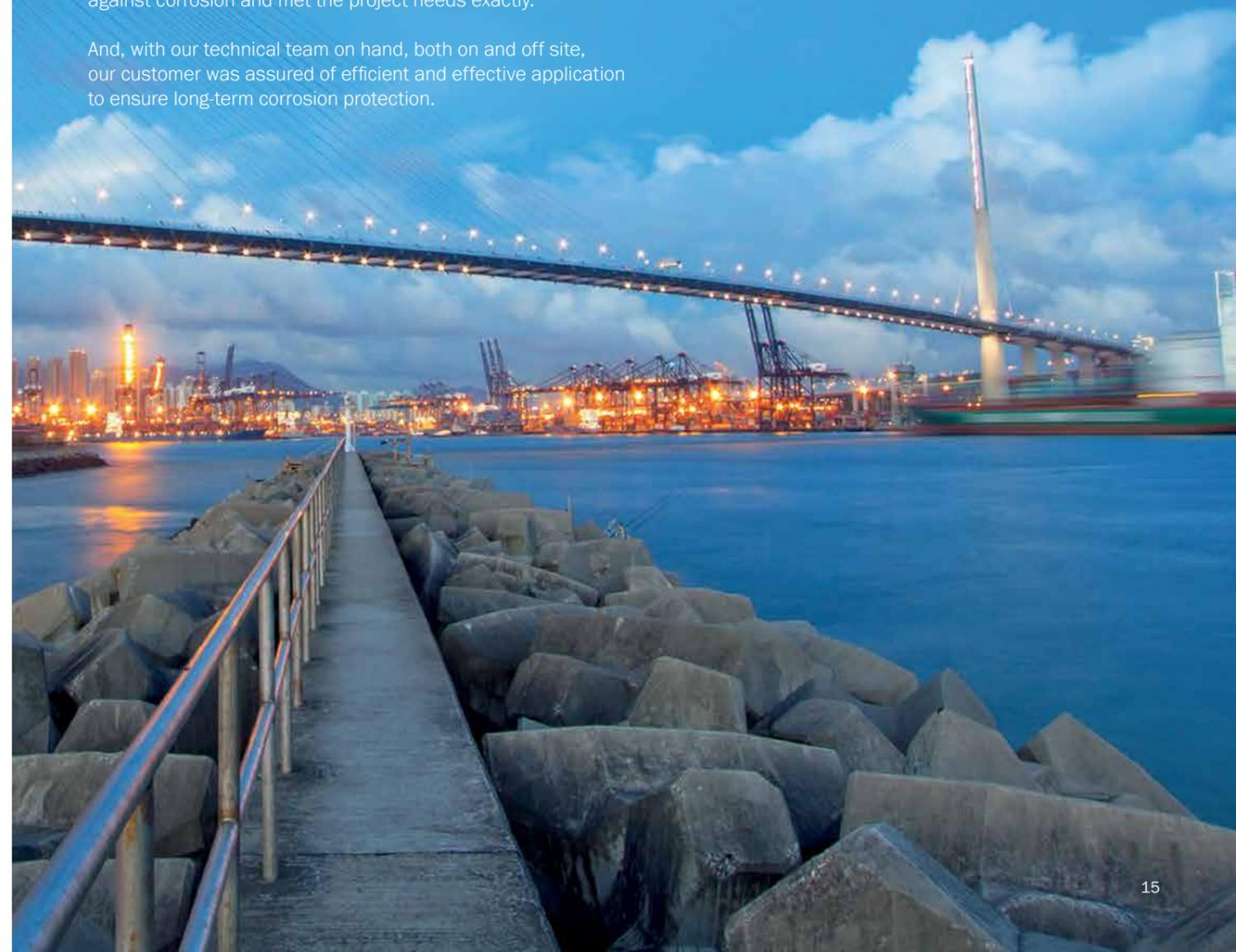
The elegant span of the Stonecutters Bridge in Hong Kong stretches some 1,018 metres, and, with a tower height of 290 meters, is an impressive landmark.

The third longest cable-stayed bridge in the world, it is constructed to British standards and uses a high anti-corrosive coating system to ensure durability in the Hong Kong Bay's marine climate.

As a trusted world-leading coatings supplier, we were the customer's choice. Our globally certified coatings provide proven protection against corrosion and met the project needs exactly.

And, with our technical team on hand, both on and off site, our customer was assured of efficient and effective application to ensure long-term corrosion protection.

Products
Hempadur Zinc 15350
Hempadur ZP 47940
Hempathane Topcoat 55210



# Troja

Prague

The award-winning Troja Bridge carries pedestrians, cyclists, four lanes of traffic and a double-track tramway over the River Vltava into Prague city centre.

The unique design, which includes a huge number of assembly joints and large overhangs, called for a unique coatings solution, particularly given the C4 corrosive environment and 30-year coating life-cycle specification.

Our highly protective solution was selected after extensive laboratory performance testing and the landmark bridge is now topcoated with Hemplathane HS 55610 to provide long-lasting colour fastness.

## Products

Hempadur Zinc 17360

Hempadur Fast Dry 15560

Hemplathane HS 55610

## 8 KARGO Bridges on the Amsterdam-Rhine canal

KARGO – is a public sector project sponsored and funded by the Rijkswaterstaat, for the extensive refurbishment of 4 steel arch bridges, and the construction of 4 new bridges: Amsterdamse, Schellingwouderbrug, Schalkwijk, Juthphase, Weesp, Loenesloot, OverEindse, Breukeler bridges. The aim of the project is to bring these infrastructures up to 21st century standards, both in terms of safety and transport capacities. Hempel is supplying the protective coatings for all 8 bridges, specified to comply with the client's demands for the paintwork to be certified under ISO 12944 for a C5 environment.

## Products

Hemplathane HS 55610

Hempadur Mastic 45880

## Langenfeld Bridge

A major investment in the German Autobahn network is the Langenfeld Bridge. On the outskirts of Hamburg, between Volkspark and West Stellingen, this is an important commuter route on the A7, one of the longest and busiest motorways in Germany.

## Products

Hempadur TL/ZN 87260

Hempadur TL87/ZP 87431

Hempadur TL87/EG 87280

Hemplathane TL87/RAL 87481

## De Hef Bridge, Rotterdam

We are helping to restore De Hef Bridge in Rotterdam, the oldest rail bridge in the city and a significant monument. De Hef Bridge served the city centre of Rotterdam from 1927 until 1993. The bridge has been blasted and recoated with a modern 3-layer coating system giving class C5 high protection.

## Products

Hempadur Mastic 45880

Hemplathane TL87/EG 87480



Author: DelftscheSlaolie



# Selected references

Project	Location	Products	Year
Railway bridges	Romania	Hempadur Avantguard 750, Hemplathane HS 55610	2021
Highway Bridge SO 202 Mengusovce - Jánovce	Slovakia	Hempadur Zinc 17360, Hempadur 47200, Hemplathane Topcoat 55210	2015
Langenfeld Bridge, Hamburg	Germany	Hempadur TL/ZN 87260-19840, Hempadur TL87/ZP 87431-R8012, Hempadur TL87/EG 87280-DB601, Hemplathane TL87/RAL 87481-R9006	2014
ZheJiang Bin Hai Bridge	China	Hempadur Epoxy Sealer 05990, Hempadur Mastic 47550, Hemplathane PU Topcoat 55190	2014
Afcons Bridge Project in Jammu	India	Hempadur Zinc 17420, Hempadur Ultra-strength 47500, Hemplathane PU Topcoat 55190	2013
Zhang Hua Highway Li Shui Bridge	Hunan	Epoxy Sealer 05990, Hempadur Mastic 45880, Hemplathane Topcoat 55210	2013
Viaduct Deck Internal	Turkey	Hempadur Pro 17411, Hempadur Mastic 45880	2013
Forth Bridge Piers	Scotland	Hempadur Zinc 17360, Hempadur MIO 47950, Hemplathane HS 55613	2013
Bridge Mokre Lazce	Czech Republic	Hempadur Zinc 17360, Hempadur Fast Dry 17410, Hemplathane HS 55610	2013
Amsterdam Bridge, new stairs and construction	Netherlands	Hempadur Mastic 45880, Hemplathane HS 55610	2013
Tsakona Arch Bridge	Greece	Hempadur Fast Dry 17410, Hemplathane Topcoat 55210	2013
Si Chuan Nan Xi Bridge	Sichuan	Epoxy Sealer 05990, Hempadur Mastic 45880, Hemplathane Topcoat 55210	2012
Railway Bridge - Komarno, Km 3,021	Slovakia	Hempadur 15570, Hempadur 45143, Hemplathane HS 55610	2012
An Hui Tong Ling Yangtze River Bridge	China	Hempadur Epoxy Sealer 05990, Epoxy 45150 PU topcoat 552C0	2011
Bizkaia Bridge	Spain	Hempatex Hi-Build 46330/46410, Hempadur 45150	2011
Chongqing Qingcaobei Changjiang Bridge	China	Hempadur Zinc 17360, Hempadur Mastic 45880, Hemplathane Topcoat 55210, Hempel's Fluorocarbon Topcoat 559CN	2011

Project	Location	Products	Year
Jiangyin Yangtze River Bridge	China	Hempadur Zinc 17360, Hempadur 45150, Hempel's Fluorocarbon Topcoat 559CN	2011
Lanheses Bridge	Portugal	Hemplathane Enamel 5510E	2011
Jing-Yue Yangtze River Highway Bridge	China	Hempadur Epoxy 45150, Fluorocarbon Topcoat 559CN, Hempadur Epoxy Sealer 05990, Epoxy 45150, PU Topcoat 552C0	2011
Jiangxi Jiujiang Bridge	China	Hempadur Zinc 17360, Hempadur 45150, Hempel's Fluorocarbon 555CN	2011
Selune Bridge	France	Hempadur 47200, Hemplathane Topcoat 55910	2011
La Riviere St Etienne Bridge	France	Hempadur Pro Zinc 17380, Hempadur Mastic 8588E, Hemplathane HS 55610	2011
Agivey Bridge	United Kingdom	Hempadur Mastic 45880, Hemplathane Enamel 5510E	2010
Asnieres Bridge	France	Hempadur 45143, Hemplathane Topcoat 55910	2010
Travessia Do Sado Refer Railway Bridge	Portugal	Hempadur Zinc 17340, Hemplathane HS 55810	2010
Nanjing Yangzi River 4th Bridge	China	Galvosil 15700, Hempadur Hi-Build 45230, Hempadur 45150, Hemplathane PU Topcoat 55210, Hempadur Zinc 17360, Hempadur Hi-Build 45200	2010
Hubei Edong Changjiang Expressway Bridge	China	Galvosil 15700, Hempadur 45150, Hemplathane Topcoat 55210, Hempadur Zinc 17360	2010
Sinntal Bridge	Germany	Hempadur TL/ZN 87260, Hempadur TL87/ZP 87431, Hempadur TL87/EG 87280, Hemplathane TL87/RAL87481	2010
Dames-Tepelene Bridge	Albania	Hempadur Mastic 45880, Hemplathane PU Topcoat 55210	2010
Bridge D3 Tabor	Czech Republic	Hempadur Fast Dry 15560, Hemplathane PU Topcoat 55210	2008
Zhe Jiang Zhou Shan Xin Cheng Bridge	Zhejiang	Hempadur Multi-Strength 45540, Hemplathane PU Topcoat 55210	2005

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 factories, R&D centres and stock points are established in every region.

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.

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