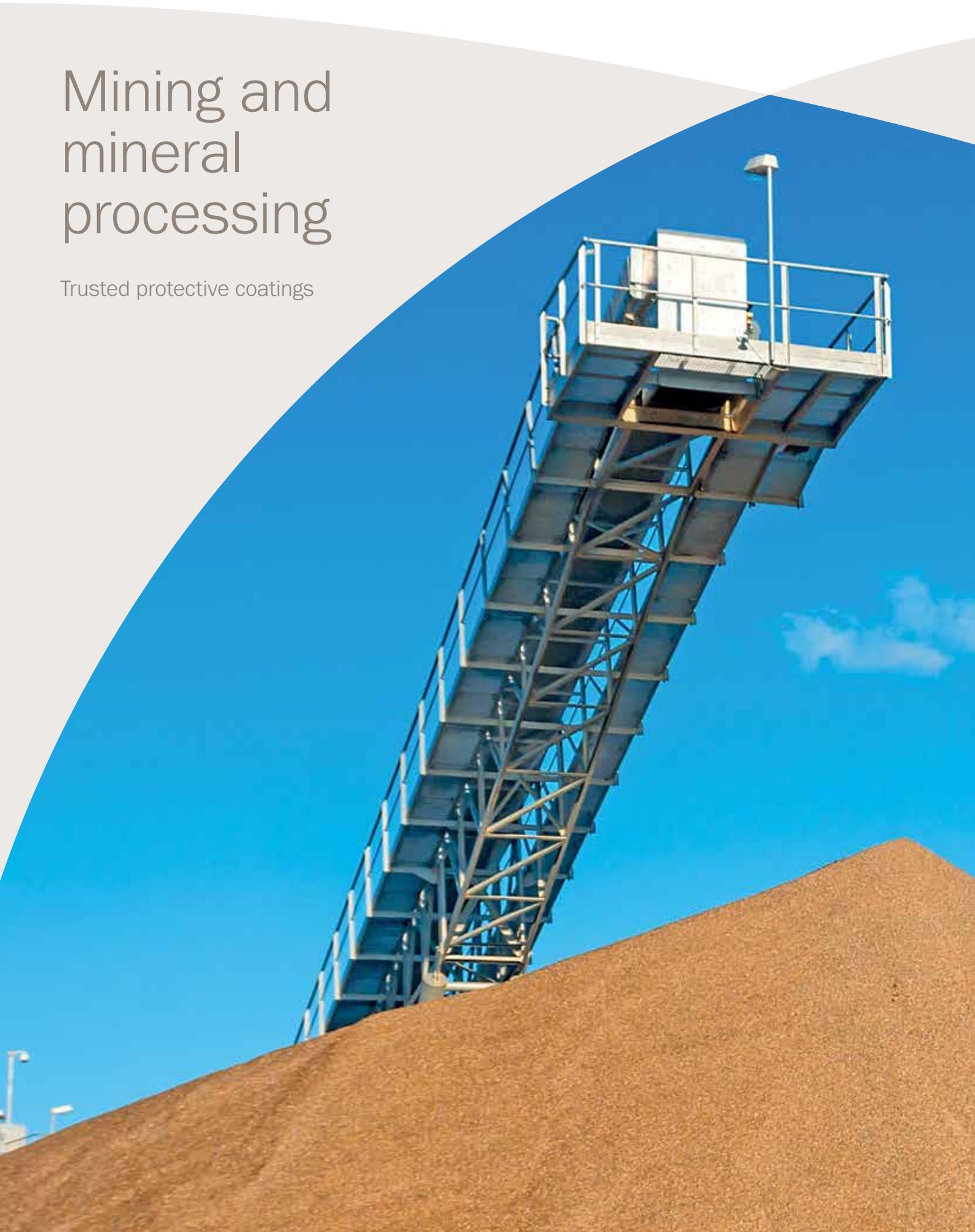


# Mining and mineral processing

Trusted protective coatings



# World-leading coatings supplier

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

From the world's longest bridges and tallest skyscrapers to airports, power stations and mineral processing facilities, 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, Protective, Industrial and Decorative markets, so you can be sure we offer trusted technology and expert knowledge to extend the life cycle of your mining assets.

#### Global service

We supply coatings around the world, often delivering different coatings to different locations for the same project.

#### Proven performance

We have a full range of coatings that offer a winning combination of high performance protection and optimised application for mining installations globally. We have coated structures in some of the most challenging environments and, with our proven track record, are the trusted protective coatings partner for customers worldwide.

#### Professional support

Our globally based technical service 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 in aggressive industrial environments.

# Tough, durable corrosion protection

for your mining assets

**We understand that your assets face a number of unique challenges with:**

- continual, 24/7 operations
- highly variable weather conditions
- the presence of abrasive rock dust
- constant exposure to water
- chemically corrosive environments

Your coating needs vary from project to project, from mineral to mineral, so we combine our extensive knowledge of your mining processes with a focus on the challenges and the unique needs of your project to give you the right solution.

Our high performance coatings are quality tested and approved to ensure you benefit from tough, long-lasting corrosion protection whether you are coating new structures and equipment or looking for easy-maintenance coatings for specific environmental conditions.

Continual product improvements not only to offer you better quality protection, but contribute to construction strength, safety and occupational health.

Our systems are designed to protect areas that are subjected to harsh conditions, abrasion and exposure to acidic environments that lead to corrosion, including:

- primary, secondary and third processing
- smelters, refineries and electrowinning
- transport and ship loading
- mining equipment

No matter what mineral you work with – from coal to precious metals – we have the right coating solution to extend the life of your assets.





# Focus on maintenance

We are passionate about keeping your mining facilities operational, helping your productivity by reducing the downtime caused by equipment failure or scheduled maintenance.

Using the right high performance protective coatings minimises the corrosion caused by complex mining environments, high abrasion and chemical exposure. Protecting your structures and equipment will save on lost time, save on cost and help to keep your high standards of safety and security.

Our proven, advanced solutions are:

- durable for aggressive environments
- resistant to weather and diverse climates
- compliant to your specifications
- colour fast and UV resistant
- easy to apply for fast return to service

We meet the exact needs of your maintenance cycle, with our expert technical services team available to review, recommend and oversee application of the right coating systems, for both preventative and corrective maintenance, for your operations.

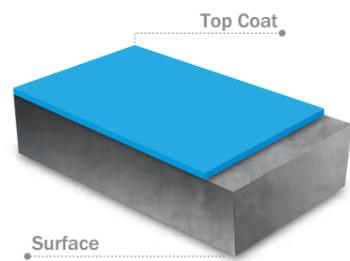
Built for the rugged mining industry, our anti-corrosion protective coatings are made for your tough maintenance challenges.

# Tailored for long-term protection

We have extensive experience in developing coatings specifically designed to protect assets when mining for coal, bauxite, copper, iron ore, gold and other precious metals and are trusted and specified by many global partners.

Here we illustrate just a few of our tailored systems that safeguard steel and concrete from the harsh corrosive elements of the mining process. Other paint systems are available, to suit customer needs.

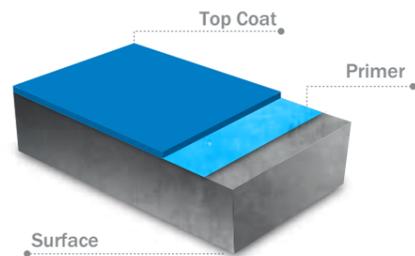
Reference Schemes ISO 12944



Surface treatment : Sa 2<sup>1/2</sup> (SSPC SP10)

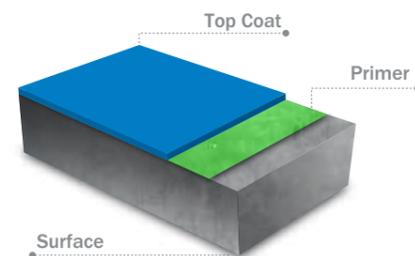
### C2 5-15 years

System 1	Thickness (µm)
Hempadur Fast Dry 45410	120
<b>Total</b>	<b>120</b>



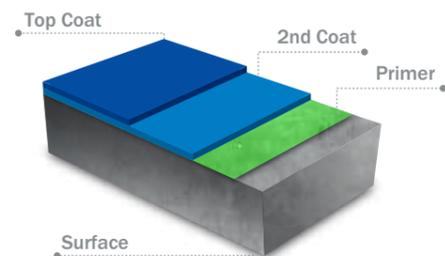
### C3 >15 years

System 2	Thickness (µm)
Hempadur Fast Dry 17410	120
Hempadur Fast Dry 45410	80
<b>Total</b>	<b>200</b>



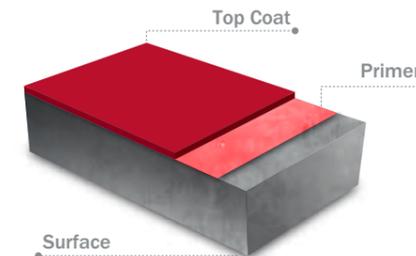
### C4 5-15 years

System 3	Thickness (µm)
Hempadur Quattro 17634	180
Hempathane HS 55610	60
<b>Total</b>	<b>240</b>



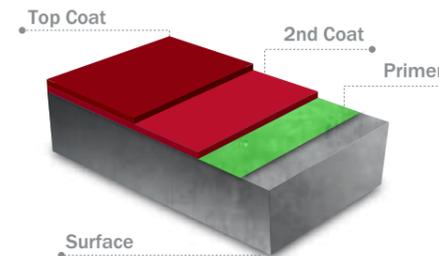
### C4 >15 years

System 4	Thickness (µm)
Hempadur Avantguard 750	60
Hempadur Fast Dry 17410	120
Hempathane HS 55610	60
<b>Total</b>	<b>240</b>



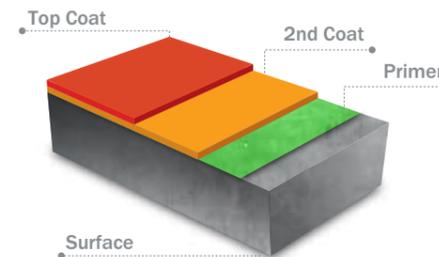
### C5-I & C5-M >15 years

System 5	Thickness (µm)
Hempadur Quattro 17634	160
Hempadur Quattro 17634	160
<b>Total</b>	<b>320</b>



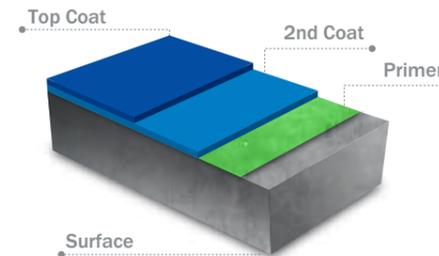
### C5-I & C5-M >15 years

System 6	Thickness (µm)
Hempadur Quattro 17634	130
Hempadur Quattro 17634	130
Hempathane HS 55610	60
<b>Total</b>	<b>320</b>



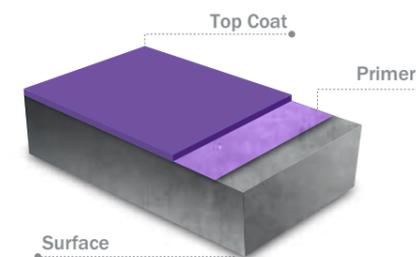
### C5-I & C5-M >15 years

System 7	Thickness (µm)
Hempadur Mastic 45880	130
Hempadur Mastic 45880	130
Hempathane HS 55610	60
<b>Total</b>	<b>320</b>



### C5-I & C5-M >15 years

System 8	Thickness (µm)
Hempadur Avantguard 750	60
Hempadur Quattro 17634	200
Hempathane HS 55610	60
<b>Total</b>	<b>320</b>



### C5-I & C5-M >15 years Acid condition\*

System 9	Thickness (µm)
Hempadur 37620	250
Hempadur 37620	250
<b>Total</b>	<b>500</b>

\*Note: wet on wet application

# Focus on Avantguard®

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 anti-corrosion technology that redefines anti-corrosion. It is based on activated zinc and is locked in to our range of high performance protective coatings.

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

Avantguard significantly reduces the effects of corrosion and offers superior protection. This increased durability has been proven in extensive tests against standard zinc primers.

#### Improves full systems

Strengthening the system at it's core, Avantguard gives the system enhanced anti-corrosion performance.

#### Redefines protection

Avantguard shows reduced rust creep and significantly better corrosion protection in Cyclic corrosion testing (ISO 20340) NORSOK M501 revision 6 and Salt Spray testing (ISO 12944).

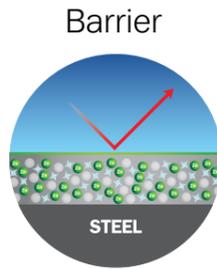
#### Redefines productivity

Avantguard has a high tolerance to different climatic conditions, displayed during application under extreme thickness, temperature and humidity.

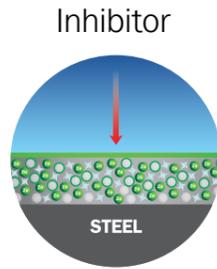
#### Redefines durability

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

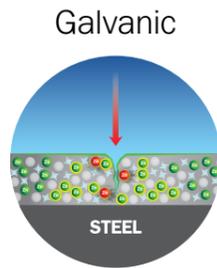
This new generation of activated zinc primers reduces the effects of corrosion, offers advanced protection and increased durability for all-round performance and unlike standard zinc epoxies, is effective using all three methods of protection.



**Avantguard has improved barrier properties**  
Avantguard displays low water permeability. The salts produced by the activation process fill any space within the film, sealing it, and enhancing the barrier properties.



**The inhibition effect helps improve the anti-corrosive 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 structure.



**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 M/I 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)	1h 30min
VS%	65
VOC (g/L)	319
Pot life (20°C)	3hrs
Min. overcoating intervals with epoxy (20°C)	1h
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 it's properties even at excessive application.

Complies with NORSOK M-501 Ed. 6 (ISO 20340) and Level 2, type II in SSPC Paint 20, 2002.

Can utilise ASTM D520, type II zinc dust.

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

\* Salt spray test according to ISO 12944, Cyclic corrosion test (ISO 20340) NORSOK M 501 revision 6.  
\*\* Proven in Thermal Cycling Resistance test, NACE cracking test and Hempel welding test.

# Our coatings travel the world

Our coatings travel the globe, protecting assets from harsh environments and rough treatment. As well as coatings for new equipment, we also have a range of coatings for repair and maintenance work, and can work closely with you to help streamline your application lines or maintenance intervals.

We are one of the world's leading suppliers of protective coatings for rail equipment, from exterior coatings for rail cars, interior linings for hopper cars, ground transport equipment and marine.



# The power to protect

We are trusted by the power industry to provide reliable high performance coating solutions to deliver advanced corrosion protection, temperature, chemical and abrasion resistance, for tough, long lasting protection for plant and equipment alike.

From speciality coatings for FGD units and tailored coatings for boilers to temperature resistant coatings, we offer systems that are designed for demanding environments and are trusted and specified by major EPC contractors and OEMs.



# Our customer promise

**Peace of mind**

We will manage your coatings project for you to release your resources and thus focus on its business processes.

**Quality assurance and control**

We will ensure that specifications are correct. That technical requirements and quality standards are met consistently and efficiently.

**Risk management**

We will identify potential risks, deviations, specifications and disagreements, and also advise on corrective measures and monitoring execution.

**Control of consumption**

We will handle paint consumption and diluent and work diligently with application equipment in work to minimise excessive consumption and avoid delays due to supply problems.

**Communication and documentation**

We will facilitate communication and timely distribution of daily progress reports and complete packages of technical documentation.

**Availability of service full time**

We have the ability to monitor all aspects of the preparation of the surface and the paint application - anywhere in any moment!

**Systematic reporting**

All our reports are prepared in accordance with standard protocols reporting worldwide, with reference to internationally recognised standards of painting.

**Applicator training**

As part of our technical support service, we offer training for applicators to ensure the coating will give you the optimum protection for the longest possible time.

**By choosing Hempel, you are choosing a brand you can trust.**

Since 1915 Hempel has been a world-leading coatings specialist, providing protection and inspiration to the world around us. Today we have over 5,500 people in 80 countries delivering trusted solutions in the protective, decorative, marine, container, industrial and yacht markets. This includes many recognized brands like Crown Paints, Schaeppman and Jones-Blair.

Hempel is proudly owned by the Hempel Foundation, which supports cultural, humanitarian and scientific causes across the world.

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