COMPLETE STORAGE TANK COATING PROTECTION
HEMPEL OFFERS A RANGE OF COATING SOLUTIONS FOR THE COMPLETE PROTECTION OF STORAGE TANKS:

- Tank linings for the storage of crude oil, bio-fuels, chemicals, water, petroleum products and vegetable oils.
- Exterior tank coating systems, tailor-made to customers’ needs.
- Coating systems for efficient storage tank maintenance.
**Water tanks**

Water storage is very important in a world where potable water has become a scarce resource. Larger tanks made from steel or concrete will need to be protected on all interior surfaces with special certified coatings in order to ensure the potable water quality.

**Crude oil tanks**

Typically crude oil tanks are large. We find them close to where the oil is explored and in connection with refineries. When stored, crude oil has a tendency to separate in two phases, of which the water phase collects at the bottom. Such water phase is corrosive and, therefore, it is vital to coat this part of the tank with a suitable lining.

**Fuel tanks**

Fuel tanks represent the highest number of tanks as they hold all the gasoline, fuels and oils needed to run the motors of the world. The major fuel tank farms are located at the refineries and in industrial or coastal areas with a developed infrastructure for shipping and land transportation. Smaller fuel tank farms are found in almost all airports, seaports and urban areas around the world. Like crude oil tanks, most petroleum fuel tanks are just coated on the interior bottom surfaces only.

**Chemical tanks**

The number of liquid chemicals to be stored is ever increasing. Hempel tailors the specifications to the tank operators' requirements based on proven coatings and linings.

**Bio-fuels**

Bio-fuels covers a large number of different liquids derived from organic matter or biomass. Bio-fuels have been known and available since the first motors were invented in the 19th century. Today bio-fuels are world-wide trading commodities as they are used as substitutes for petroleum fuel products. Of the many types of bio-fuels available bio-ethanol and bio-diesel are the main products today. Both bio-ethanol and bio-diesel are widely used as a blend with petroleum fuels and in some areas of the world they are used as a pure fuel for automobiles and machinery. Hempel has a proven coating assortment available for bio-fuel tanks.
## TANK LININGS

<table>
<thead>
<tr>
<th>Name</th>
<th>Typical Use</th>
<th>Product Features</th>
<th>Resistance</th>
<th>High temperature resistance</th>
<th>VOC Content</th>
<th>Color Shades</th>
<th>Certificates and Approvals</th>
</tr>
</thead>
</table>
| HEMPADUR 35900        | As an interior lining in tanks, pipelines etc. for crude oil, water and produced water up to 93°C | • High-build  
• Solvent-free  
• Excellent adhesion  
• Resistance to high temperatures  
• Specially developed for Oil & Gas segment | Crude oil  
Water  
Produced Water  
Bio fuels | Up to 93°C | 22 g/l | 20320/Cream | NORSOK M-501 rev. 6, systems 7A, 7B, 7C, 3C, 3E, 3D  
ARAMCO APCS-2E  
IMO PSPC (COT Test)  
Shell  
Chevron |
| HEMPADUR ANTI-STATIC 85170 | As an anti-static tank lining for storage tanks containing crude oil, fuel oil, diesel oil, jet fuel, motor gasoline and similar. | • Very good adhesion  
• Excellent water and chemical resistance | Crude oil  
Fuel oil  
Diesel oil  
Jet fuel  
Motor gasoline | In water (water phase): Maximum: 90°C | 310 g/l | 19990/Black  
12400/Grey | ITB Recommendation  
Water Research Centre (WRAS)  
NORSOK M-501 rev. 6, system 3A, prequalified to systems 7A and 7B  
Tested according ANSI/AWWA C210-07 for internal use in pipelines for potable water services |
| HEMPADUR 35560        | As a lining in potable water tanks and pipelines.                            | • High-build  
• Solvent-free  
• Excellent resistance to fresh water | Potable water | Up to 45°C (no temperature gradient) | 0 g/l | 50900/Red  
20320/Cream  
10500/Light Grey | NORSOK M-501 rev. 6, system 7A, 7B  
Tested according ANSI/AWWA C210-07 for internal use in pipelines for potable water services |
| HEMPEL'S VINYL ESTER GF 35550 | As a lining in immersed environments where superior resistance to chemical attack is required. It is also a good choice for aggressive atmospheric and spillage conditions. | • Reinforced with glass flakes  
• High-build  
• Superior resistance to chemicals | Most chemical environments with pH range 0 to 13  
demineralised water solvents | Up to 95°C in sea water | 355 g/l | 11630/Off-white | NORSOK APCS  
British Defence standards 80-97 annex G  
EI 1541  
FDA |
| HEMPADUR 85671        | As an interior lining in tanks, pipelines etc. for hot water, brine, crude oil, etc.  
As a primer coat in specific painting systems. | • Good resistance at high temperatures  
• Good adhesion | Hot water  
Brine  
Crude oil  
Potable water | In water (maximum gradient 15°C): up to 90°C | 316 g/l | 11150/Light grey* | NORSOK M-501 system no. 3 Water research Centre (WRAS)  
Folkehelseinstituttet  
ARAMCO APCS 2A, 2B, 2C  
British Defence standards 80-97 annex G EI 1541  
ASTM A-490 Class “B”  
FDA |
| HEMPADUR 15400        | As a tank lining for fuels and gasoline | • Excellent chemical resistance  
| Wide range of chemicals | In water (no temperature gradient): up to 50°C | 463 g/l | 10000/White* | NORSOK M-501 rev.4, system 3B  
Recommended for system 3G  
ARAMCO APCS B  
British Defence standards 80-97 annex G EI 1541 |
| HEMPEL'S GALVOSIL 1570M | SPECIAL ZINC SILICATE SYSTEMS for a wide range of fuels and chemicals and with outstanding resistance against abrasion. | • Self-curing  
• Excellent chemical resistance | Most chemical environments with pH range 6 to 9 | For aqueous cargoes the maximum temperature for storage is 45°C.  
Non-aqueous cargoes - the maximum temperature for storage is 90°C. | 434 g/l | 19840/Metal grey | NORSOK M-501 rev.4, system 3B  
Recommended for system 3G  
ASTM A-490 Class “B”  
FDA |

*other shades according to assortment list
EXAMPLES OF TYPICAL TANK LINING SYSTEMS IN POLAND

A tank lining system for standard fuels and bio-fuels that meet Polish regulations in terms of anti-static properties:

<table>
<thead>
<tr>
<th>Coating system</th>
<th>DFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEMPADUR ANTI-STATIC 85170</td>
<td>150 μm</td>
</tr>
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<td>HEMPADUR ANTI-STATIC 85170</td>
<td>150 μm</td>
</tr>
</tbody>
</table>

A tank lining system for water and produced water up to 93 °C:

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<tr>
<th>Coating system</th>
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</tr>
</thead>
<tbody>
<tr>
<td>HEMPADUR 35900</td>
<td>250 μm</td>
</tr>
<tr>
<td>HEMPADUR 35900</td>
<td>250 μm</td>
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</tbody>
</table>

Benefits:
- Improved works performance
- Excellent corrosion protection
- High chemical resistance
- High visibility due to light colours & glossy surface
- Long lifetime – up to 20 years

TANK EXTERIOR COATINGS

In addition to a wide range of tank linings, Hempel also offers proven coating systems for tank exteriors for all corrosive environments, according to ISO 12944.

Benefits:
- Surface tolerant coatings that provide good steel penetration
- Possibility to apply in high DFT, which leads to higher efficiency and time saving during application
- Winter grade versions that cure at low temperatures (down to -10°C)
- Environmentally friendly solutions, with low VOC

Hempel specialists can define a tailor-made system, depending on specific customer needs.

TYPICAL TANK EXTERIOR COATING SYSTEMS

• A cost efficient system, corrosivity category C4/low durability according to ISO 12944

<table>
<thead>
<tr>
<th>Coating system</th>
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<tbody>
<tr>
<td>HEMPADUR MASTIC 45880 / HEMPADUR 47200</td>
<td>140 μm</td>
</tr>
<tr>
<td>HEMPATHANE HS 55610</td>
<td>60 μm</td>
</tr>
</tbody>
</table>

• An external system, corrosivity category C4/medium durability according to ISO 12944

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<tbody>
<tr>
<td>HEMPADUR MASTIC 45880 / HEMPADUR 47200</td>
<td>90 μm</td>
</tr>
<tr>
<td>HEMPADUR MASTIC 45880 / HEMPADUR 47200</td>
<td>90 μm</td>
</tr>
<tr>
<td>HEMPATHANE HS 55610</td>
<td>60 μm</td>
</tr>
</tbody>
</table>

• An external system, corrosivity category C4/long durability according to ISO 12944

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<tbody>
<tr>
<td>HEMPADUR MASTIC 45880 / HEMPADUR 47200</td>
<td>110 μm</td>
</tr>
<tr>
<td>HEMPADUR MASTIC 45880 / HEMPADUR 47200</td>
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</tr>
<tr>
<td>HEMPATHANE HS 55610</td>
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</table>

HEMPADUR MASTIC 45880 is a high build, high volume solids, epoxy paint, which forms a hard and tough coating. It is suitable as a primer and intermediate coat in heavy duty systems where low VOC and high film build are required. The polyurethane topcoat, HEMPATHANE HS 55610, assures a long-lasting appearance with excellent gloss and colour retention.

HEMPADUR ANTI-STATIC 85170 is a two-component, amine adduct cured phenolic epoxy (novolac) paint designed for anti-corrosion protection of internal surface of storage fuel tanks where high level of anticorrosion protection and anti-static properties are required. For the fuels tanks other coatings than HEMPADUR ANTI-STATIC 85170 can be applied when there is no rules to have the antistatic one.

HEMPADUR 47200 is a two-component, polyamine adduct cured epoxy paint with a very short drying time. The product cures at temperatures above -10°C and form a tough and hard-wearing coating.

STORAGE TANK MAINTENANCE

For maintenance, Hempel specialists can identify the most suitable protective system, based on the original coating, scale of damage, corrosive environment and storage tank content.

In addition, we can support our customers in setting up repair coating work procedures so that the best possible results can be achieved.

Benefits:
- Proven systems for maintenance
- Fibre technology for tank bottom repair
- Cost-effective solutions
- Short ‘out of order’ time
LIST OF REFERENCES

Here are a small selection of references for Hempel’s tank lining products. For more information please contact your local Hempel office.

### HEMPADUR 35900

<table>
<thead>
<tr>
<th>Project name</th>
<th>Owner</th>
<th>Country</th>
<th>Year</th>
<th>Subsegment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONATRACH, ARZEW</td>
<td>STATOIL</td>
<td>Algeria</td>
<td>2013</td>
<td>Downstream-Tank and storage terminals</td>
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### HEMPADUR 35760

<table>
<thead>
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<th>Subsegment</th>
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<tbody>
<tr>
<td>GTT-O Phase 2</td>
<td>Oiltanking - Terneuzen</td>
<td>The Netherlands</td>
<td>2013</td>
<td>Downstream-Tank and storage terminals</td>
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### HEMPADUR 35650

<table>
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<tbody>
<tr>
<td>Egypt Potable Water Pipe Line</td>
<td>Egypt Government</td>
<td>Egypt</td>
<td>2011</td>
<td>Pipelines-Potable water pipelines</td>
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### HEMPEL’S VINYL ESTER GF 35910

<table>
<thead>
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<th>Year</th>
<th>Subsegment</th>
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<tbody>
<tr>
<td>5G-Zamia Tank Wagina - 62 Dim For HCL Transport</td>
<td>GATX</td>
<td>Slovakia</td>
<td>2011</td>
<td>Rail new construction</td>
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### HEMPADUR 15400

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<th>Subsegment</th>
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### HEMPEL’S GALVOSIL 1570M

<table>
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<th>Subsegment</th>
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<tbody>
<tr>
<td>Dalian Power Plant</td>
<td>EDN</td>
<td>Germany</td>
<td>2012</td>
<td>Power Generation-Coal fired power plants</td>
</tr>
</tbody>
</table>

### ENVIRONMENTAL CONCERN

Hempel supports the protection of the environment and is fully committed to adhere to the strict environmental demands. We work actively to reduce the impact of our operations on human health and the environment, within the limits of sound economics and currently available technologies. Therefore, our range of coatings includes very low VOC products, which allow our customers to comply with the most demanding environmental requirements.

**Note:**

The data, specifications and recommendations provided in this brochure are obtained from individual product data sheets. This is a summary only, not complete information and is subject to change. Therefore, it is exclusively the responsibility of the user to obtain accurate, complete and appropriate information in relation to any particular intended use of these and other Hempel products. Unless expressly agreed otherwise in writing, the products are supplied and all technical assistance is provided subject to Hempel’s general terms and conditions of sale, delivery and service. Product data are subject to change without notice, so you should continue to monitor the latest version of the individual product data sheets.