



# Product Data

## HEMPADUR® 45141/ HEMPADUR® 45143

45141: BASE 45148 with CURING AGENT 97820  
45143: BASE 45148 with CURING AGENT 97430

### Description:

HEMPADUR 45141/45143 is a two-component, polyamide adduct cured epoxy paint with good wetting properties and low water permeability. It is selfpriming and forms a hard and tough coating which has good resistance against abrasion and impact as well as to seawater, mineral oils, aliphatic hydrocarbons and splashes from petrol and related products. Harmless to grain cargoes.

### Recommended use:

1. As a high build primer, intermediate and/or finishing coat in (heavy duty) paint systems according to specification. (As a finishing coat where a cosmetic appearance is of less importance).
2. For repair and maintenance work at application temperatures above -10°C/15°F on hatch covers, decks, in cargo holds, etc.
3. As a ballast tank coating.

HEMPADUR 45143 is intended for use in cold/temperate climates, HEMPADUR 45141 for warmer climates - see APPLICATION CONDITIONS overleaf.

### Service temperatures:

Dry exposure only: Maximum 150°C/302°F (See REMARKS overleaf)  
Ballast water service: Resists normal ambient temperatures at sea\*  
Other water service: 40°C/104°F (no temperature gradient)  
Other liquids: Contact HEMPEL  
\*Avoid long-term exposure to negative temperature gradients.

### Certificates/Approvals:

Complies with EU Directive 2004/42/EC, subcategory j.  
See REMARKS overleaf.  
HEMPADUR 45143 has a French EC-type Examination Certificate.

### Availability:

Part of Group Assortment. Local availability subject to confirmation.

### PHYSICAL CONSTANTS:

Version; mixed product:  
Colours/Shade nos:  
Finish:  
Volume solids, %:  
Theoretical spreading rate:  
Flash point:  
Specific gravity:  
Surface dry:  
Dry to touch:  
Fully cured:  
V.O.C.:

| <b>45141</b>                            | <b>45143</b>                           |
|---|--|
| Red/50630*                              | Red/50630*                             |
| Semi-gloss                              | Semi-gloss                             |
| 60 ± 1                                  | 60 ± 1                                 |
| 4.0 m <sup>2</sup> /litre - 150 micron  | 4.0 m <sup>2</sup> /litre - 150 micron |
| 160 sq.ft./US gallon - 6 mils           | 160 sq.ft./US gallon - 6 mils          |
| 26°C/79°F                               | 26°C/79°F                              |
| 1.3 kg/litre - 10.8 lbs/US gallon       | 1.3 kg/litre - 10.8 lbs/US gallon      |
| 4 (approx.) hrs at 20°C/68°F (ISO 1517) | 5 (approx.) hrs at 5°C/41°F (ISO 1517) |
| 7 (approx.) hours at 20°C/68°F          | 11 (approx.) hours at 5°C/41°F         |
| 7 (approx.) days at 20°C/68°F           | 20 (approx.) days at 5°C/41°F          |
| 380 g/litre - 3.2 lbs/US gallon         | 375 g/litre - 3.1 lbs/US gallon        |

\*Other shades including a MIO version, colour no. 12430, according to assortment list.

The physical constants stated are nominal data according to the HEMPEL Group's approved formulas. They are subject to normal manufacturing tolerances and where stated, being standard deviation according to ISO 3534-1.

### APPLICATION DETAILS:

Mixing ratio:  
Application method:  
Thinner (max.vol.):  
Pot life:  
Nozzle orifice:  
Nozzle pressure:  
Cleaning of tools:  
Indicated film thickness, dry:  
Indicated film thickness, wet:  
Recoat interval, min:  
Recoat interval, max:

| <b>45141</b>  | <b>45143</b>                        |
|---|-------------------------------------|
| Base 45148 : Curing agent 97820                               | Base 45148 : Curing agent 97430     |
| 3 : 1 by volume   | 3 : 1 by volume                     |
| Airless spray Brush   | Airless spray Brush                 |
| 08450 (5%) 08450 (5%)   | 08450 (5%) 08450 (5%)               |
| (See REMARKS overleaf)  | (See REMARKS overleaf)              |
| 2 hrs (20°C/68°F) 4 hrs (20°C/68°F)                           | 2 hrs (15°C/59°F) 4 hrs (15°C/59°F) |
| (See REMARKS overleaf)  | (See REMARKS overleaf)              |
| .019"-.023"   |                                     |
| 250 bar/3600 psi  |                                     |
| (Airless spray data are indicative and subject to adjustment) |                                     |
| HEMPEL'S TOOL CLEANER 99610 or THINNER 08450                  |                                     |
| 150 micron/ 6 mils (See REMARKS overleaf)                     |                                     |
| 250 micron/10 mils  |                                     |
| As per separate APPLICATION INSTRUCTIONS                      |                                     |
| As per separate APPLICATION INSTRUCTIONS                      |                                     |

### Safety:

Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Material Safety Data Sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes, and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well ventilated areas.



## HEMPADUR 45141/45143

**SURFACE PREPARATION:** **New steel:** When used selfprimed surface preparation as to specification. When being an integral part in heavy duty systems abrasive blasting to Sa 2½. Reference is made to separate APPLICATION INSTRUCTIONS.

**New steel, ballast tanks and similar areas:** Abrasive blasting to Sa 2½. For temporary protection, if required, use a suitable shopprimer. All damage of shopprimer and contamination from storage and fabrication should be thoroughly cleaned prior to final painting - preferably by abrasive blasting. For repair and touch-up, use HEMPADUR 45141/45143.

**Stainless steel:** (Ballast tanks in chemical carriers) to be abrasive blasted to a uniform, sharp, dense profile, ISO Comparator Medium (G), corresponding to Rz minimum 50 micron. Any salts, grease, oil, etc. to be removed before abrasive blasting is commenced.

**Repair and maintenance:** Remove oil and grease, etc. with suitable detergent. Remove salt and other contaminants by (high pressure) fresh water cleaning. Clean damaged areas thoroughly by power tool cleaning to St 3 (spot-repairs) or by abrasive blasting to min. Sa 2, preferably to Sa 2½. Improved surface preparation will improve the performance of HEMPADUR 45141/45143.

As an alternative to dry cleaning, water jetting to sound, well adhering coat and/or to steel. Intact coat must appear with roughened surface after the water jetting. By water jetting to steel, cleanliness shall be Wa 2 - Wa 2½ (atmospheric exposure) / minimum Wa 2½ (immersion) (ISO 8501-4:2006). A flash-rust degree of maximum M (atmospheric exposure) / M, preferably L (immersion) (ISO 8501-4:2006) is acceptable before application. Feather edges to sound and intact paint. Dust off residues. On pit-corroded surfaces, excessive amounts of salt residues may call for water jetting, wet abrasive blasting, alternatively dry abrasive blasting, high pressure fresh water hosing, drying, and finally, dry abrasive blasting again.

**APPLICATION CONDITIONS:** Apply only on a dry and clean surface with a temperature above the dew point to avoid condensation. HEMPADUR 45143 is intended for curing conditions down to -10°C/14°F, HEMPADUR 45141 is to be selected in warmer climates. A shift from 45143 to 45141 is most convenient to take place when the temperature is between 15°C/59°F and 25°C/77°F, however, HEMPADUR 45141 may be used for curing conditions down to 0°C/32°F in cases where surfaces are not to be immersed. Optimal spraying properties are obtained at paint temperatures of 18-22°C/64-72°F. In warm climates, the paint should be stored in a cool place. At paint temperatures below 15°C/59°F or in the case of very long spray hoses, thinning may be necessary. This will cause lower film build and longer drying time. In confined spaces provide adequate ventilation during application and drying.

**PRECEDING COAT:** None or according to specification.

**SUBSEQUENT COAT:** None or according to specification.

**REMARKS:** See separate APPLICATION INSTRUCTIONS.

VOC - EU directive 2004/42/EC:  
VOC:

|            | As supplied | 5 vol. % thinning | Limit phase I, 2007 | Limit phase II, 2010 |
|------------|-------------|-------------------|---------------------|----------------------|
| VOC in g/l | 375         | 400               | 550                 | 500                  |

For VOC of other shades, please refer to Safety Data Sheet.

Certificates/  
Approvals:

**Certificates** have been issued under the former quality number 4514. Approved by Lloyd's Register of Shipping as a recognised corrosion control coating. Tested for non-contamination of grain cargo at the Newcastle Occupational Health, Great Britain. Approved as a ballast tank coating by Germanischer Lloyd, Germany. Classified as a class 1 material according to BS 476, Part 7: 1987 (fire testing). Accepted as a corrosion control coating by Maritime Register of Shipping, Russia. Complies with Section 175.300 of the Code of Federal Regulations in respect of carriage of dry foodstuffs (FDA) in spaces with an internal surface area larger than 1000 m<sup>2</sup>/10,750 sq.ft.

Weathering/  
service  
temperatures:

The natural tendency of epoxy coatings to chalk in outdoor exposure and to become more sensitive to mechanical damage and chemical exposure at elevated temperatures is also reflected in this product.

Colour:

Light shades will have a tendency to yellow when exposed to sunshine.

Film thicknesses:

May be specified in another film thickness than indicated depending on purpose and area of use. This will alter spreading rate and may influence drying time and recoating interval. Normal range dry is 125-175 micron/5-7 mils.

Curing agent:

Curing agent 97820 and 97430 are hazy. This is intended and has no negative influence on the performance.

Thinning:

Thinning above 5% may cause lower film build and slower drying/curing. Mix the components thoroughly.

Induction time:

If the paint temperature, as an exception, is below approx. 10°C/50°F, allow the mixture to pre-react 30 minutes before use.



### **HEMPADUR 45141/45143**

Recoating: Recoat intervals related to later conditions of exposure: Consult separate APPLICATION INSTRUCTIONS. Before recoating after exposure in contaminated environment, clean the surface thoroughly by (high pressure) fresh water hosing and allow drying. If the maximum recoat interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion.

Note: **HEMPADUR 45141/45143 is for professional use only.**

ISSUED BY: HEMPEL A/S - 4514350630C0004/4514150630C0006

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Product data are subject to change without notice and become void five years from the date of issue.***



# Application Instructions

For product description refer to product data sheet

## HEMPADUR® 45141/ HEMPADUR® 45143

45141: BASE 45148 with CURING AGENT 97820

45143: BASE 45148 with CURING AGENT 97430

**Scope:** These Application Instructions cover surface preparation, application equipment and application details for HEMPADUR 45141/45143.

**Surface preparation:** **General:** In order to obtain best performance, abrasive blast cleaning is recommended. However, HEMPADUR 45141/45143 may be applied on rusty steel surfaces where higher performance is needed than obtainable with conventional coatings but where mechanical cleaning and dust removal can only be carried out (beside the removal of salts and of oily contaminants).

Remove oil and grease with suitable detergent, salt and other contaminants by (high pressure) fresh water cleaning.

### REPAIR AND MAINTENANCE:

#### Spot-repairs:

Clean damaged areas thoroughly by power tool cleaning to St 3 or by abrasive blasting to minimum Sa 2, preferably Sa 2½. Improved surface preparation will improve the performance of HEMPADUR 45141/45143. As an alternative to dry cleaning, water jetting to sound, well adhering coat and/or to steel. Intact coat must appear with roughened surface after the water jetting. By water jetting to steel, cleanliness shall be WJ-3 to WJ-2 (atmospheric exposure) / minimum WJ-2 (immersion) (NACE No. 5/SSPC-SP 12). A flash-rust degree of maximum FR-2 (atmospheric exposure) / FR-2, preferably FR-1 (immersion) (Hempel standard) is acceptable before application. Feather edges to sound and intact areas. Brush off loose material. Touch up to full film thickness.

**Compatibility:** HEMPADUR 45141/45143 may be used in connection with other generic paint systems than epoxy and polyurethanes.

In any case it is a must that the old paint system is tightly adhering and is properly prepared before the touch-up is performed. It is recommended to make a test patch.

#### Full coating:

**Compatibility with old system:** HEMPADUR 45141/45143 may exceptionally be applied directly on top of an old alkyd paint system provided this is tightly adhering. It is furthermore preferable that the old system is less than approximately 500 micron in film thickness. A test patch should always be performed before fullcoating is decided. Even old chlorinated rubber and vinyl systems may be overcoated but with an inherent risk of later tendency to "liftings" along mechanical damage and similar weaknesses.

**Removal of old system:** Full coating after mechanical removal of an old paint system is possible too. Yet, it must be considered that mechanical cleaning may produce a very smooth surface giving reason to reduced adhesive forces.

**Note:** Another risk is left over of a hard black rustscale being cleaned to an apparent brightness without showing any adhesive defects. Yet, the exposure to open air during cleaning may have started a continuous oxidation of the hard black rust making it mechanically weak and of poor adhesion to the underlying steel surface. Later, during service, the scale plus overlaying paintmaterial may flake off.

#### When used for immersion service:

1. Abrasive blasting to Sa 2½. After abrasive blasting, clean the surface carefully from abrasives and dust. For temporary protection, if required, use suitable shopprimer. All damage to shopprimer and contamination from storage and fabrication should be thoroughly cleaned prior to final painting.



## HEMPADUR 45141/45143

**Stainless steel:** (Ballast tanks in chemical carriers) to be abrasive blasted to a uniform, sharp, dense profile, ISO Comparator Medium (G), corresponding to Rz minimum 50 micron. Any salts, grease, oil, etc. to be removed before abrasive blasting is commenced.

2. If the HEMPADUR 45141/45143 will form an integral part of heavy duty systems (impact and antiabrasion purposes) best performance will be obtained by applying it directly to the blast-cleaned steel, subsidiary using HEMPADUR 15590 as "blast primer".

**Note:** On old steel surfaces having been exposed to salt water, excessive amounts of salt residues in pittings may call for high pressure water jetting, wet abrasive blasting, alternatively dry abrasive blasting, high pressure fresh water hosing, drying, and finally, dry abrasive blasting again.

### Application equipment:

HEMPADUR 45141/45143 being a high viscosity material, may require special measures to be taken at application.

### Recommended airless spray equipment:

|                   |   |
|-------------------|---|
| Pump ratio:       | min 45:1  |
| Pump output:      | 12 litres/minute (theoretical)  |
| Input pressure:   | min. 6 bar/90 psi   |
| Spray hoses:      | max 100 metres/300 feet, 1/2" internal diameter<br>max. 30 metres/100 feet, 3/8" internal diameter<br>max. 6 metres/20 feet, 1/4" internal diameter |
| Filter:           | 60 mesh   |
| Regular surfaces: |   |
| Nozzle size:      | .021"-.023"   |
| Fan angle:        | 60-80°.   |

### Complicated surfaces (and touch up):

|              |       |
|--------------|-------|
| Nozzle size: | .019" |
| Fan angle:   | 40°.  |

After finishing the application, clean the equipment immediately with HEMPEL'S TOOL CLEANER 99610.

**Note:** Increasing hose diameter may increase paint flow, thereby improving the spray fan. If longer hoses are necessary it may be necessary to raise the pump ratio to 60:1, maintaining the high output capacity of the pump.

Alternatively up to approximately 5% THINNER 08450 may be added, but thinning must be done with care as the maximum obtainable film thickness is reduced significantly by overthinning.

Airless spray data are indicative and subject to adjustment.

### Application:

**Film-build/continuity:** With this paintmaterial applied in one/few coat(s) it is of special importance that a continuous, pinhole-free paint film is obtained at application of each coat. An application technique which will ensure good film formation on **all** surfaces must be adopted. It is very important to use nozzles of the correct size, not too big, and to have a proper, uniform distance of the spray gun to the surface, 30-50 cm should be aimed at. Furthermore, great care must be taken to cover edges, openings, rear sides of stiffeners etc. Thus, on these areas a stripecoat will usually be necessary. To obtain good and steady atomizing, the viscosity of the paint must be suitable and the spray equipment must be sufficient in output pressure and capacity. At high working temperatures, use of extra thinner may be necessary to avoid dust-spray.

The paint layer must be applied homogenously and as close to the specification as possible. Avoid exaggerated film thickness due to the risk of sagging, cracks and solvent retention. The paint consumption must be controlled.

The finished coating must appear as a homogeneous film with a smooth surface and irregularities such as dust, dry spray, abrasives, should be remedied.



## HEMPADUR 45141/45143

On **poorly prepared surfaces** it is always recommended to apply first coat by brush. Extra thinning will facilitate the penetration of the paint material but will also require an extra layer to be applied.

### Wet/dry film thickness:

The thixotropic nature of HEMPADUR 45141/45143 may give a rather "wavy" surface of the paint just after application. This smoothens at drying but can make it necessary to let the wet film readings be of a higher value than indicated. In many cases, the wet film thickness reading should be 25-50 micron/1-2 mils higher than calculated. As the wavy surface becomes more smooth at drying this extra wet film thickness readings will not cause a higher paint consumption than otherwise stipulated.

### Pot life:

When measured under standard conditions the pot life is 2 hours at 15°C/59°F when using CURING AGENT 97430. However, for a 20 litres/5 US gallons mix, the heat developed by the chemical reaction between BASE and CURING AGENT may make the corresponding practical pot life shorter.

At these temperatures therefore: Irrespective of equipment, use the paint immediately after mixing. (At a normal application speed the 20 litres/5 US gallons are used in approx. 10 minutes.) Anyhow, at paint temperatures, as an exception, being lower than 15°C/59°F allow the mixture to pre-react approximately 30 minutes before use. After this induction time, apply the paint immediately.

### Safety:

Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Material Safety Data Sheets and follow all local or national safety regulations. Avoid inhalation, avoid contact with skin and eyes, and do not swallow. Take precautions against possible risks of fire or explosions as well as protection of the environment. Apply only in well ventilated areas.

### ISSUED BY:

HEMPEL A/S - 4514350630C0003/4514150630C0005

### Attached:

Tables of "physical data versus temperature"

In relation to recoating intervals the following is very important:

#### Maximum recoating intervals:

If the maximum recoating interval is exceeded, whatever the subsequent coat, roughening of the surface is necessary to ensure optimum intercoat adhesion or in the case of recoating with coatings other than HEMPADUR, apply a (thin) additional coat of HEMPADUR 45141/45143 within the following directions for recoating:

- **Long recoating intervals:**

A completely clean surface is mandatory to ensure intercoat adhesion, especially in the case of long recoating intervals. Any dirt, oil and grease have to be removed with eg suitable detergent followed by high pressure fresh water cleaning. Salts to be removed by fresh water hosing.

- **Any degraded surface layer, as a result of a long exposure period, must be removed as well.** Water jetting may be relevant to remove any degraded surface layer and may also replace the above-mentioned cleaning methods when properly executed. Consult HEMPEL for specific advice if in doubt.

To check whether the quality of the surface cleaning is adequate, a test patch may be relevant.

*This Product Data Sheet supersedes those previously issued.*

*For explanations, definitions and scope, see "Explanatory Notes" in the HEMPEL Book.*

*Data, specifications, directions and recommendations given in this data sheet represent only test results or experience obtained under controlled or specially defined circumstances. Their accuracy, completeness or appropriateness under the actual conditions of any intended use of the Products herein must be determined exclusively by the Buyer and/or User.*

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*Product data are subject to change without notice and become void five years from the date of issue.*



**HEMPADUR 45141/45143**

**Physical data  
versus temperature:**

(HEMPADUR 45141 in a dry film thickness of 150 micron/6 mils):

|  |              |              |
|--|--------------|--------------|
| Surface temperature  | 20°C/68°F    | 30°C/86°F    |
| Drying time  | 7 hours      | 3½ hours     |
| Curing time  | 7 days       | 3½ days      |
| <b>MINIMUM recoating interval<br/>related to later conditions of exposure:</b> |              |              |
| <b>Interval recoating with 46410, 56360</b>                                    |              |              |
| Atmospheric, medium  | 6 hours      | 3 hours      |
| Atmospheric, severe  | 8 hours      | 4 hours      |
| <b>Interval for recoating with 58030</b>                                       |              |              |
| Atmospheric, medium  | 11 hours     | 6 hours      |
| Atmospheric, severe  | 11 hours     | 6 hours      |
| <b>Interval for recoating with HEMPADUR and<br/>HEMPATHANE qualities</b>       |              |              |
| Atmospheric, medium  | 8 hours      | 4 hours      |
| Atmospheric, severe  | 9 hours      | 5 hours      |
| Immersion*   | 12 hours     | 6 hours      |
| <b>MAXIMUM recoating interval<br/>related to later conditions of exposure:</b> |              |              |
| <b>Interval for recoating with 46410</b>                                       |              |              |
| Atmospheric, medium  | 12 hours     | 6 hours      |
| Atmospheric, severe  | 12 hours     | 6 hours      |
| <b>Interval for recoating with 56360</b>                                       |              |              |
| Atmospheric, medium  | 10 hours     | 5 hours      |
| Atmospheric, severe  | 10 hours     | 5 hours      |
| <b>Interval for recoating with 58030</b>                                       |              |              |
| Atmospheric Medium   | 3 days       | 36 hours     |
| Severe   | 1½ days      | 18 hours     |
| <b>Interval for recoating with HEMPADUR qualities</b>                          |              |              |
| Atmospheric, medium  | None         | None         |
| Atmospheric, severe  | None         | None         |
| Immersion**  | 30 days      | 15 days      |
| <b>Interval for recoating with HEMPATHANE qualities</b>                        |              |              |
| Atmospheric, medium  | 10 days      | 5 days       |
| Atmospheric, severe  | 3 days       | 36 hours     |
| Immersion  | Not relevant | Not relevant |

\* Not relevant for HEMPATHANE qualities.

\*\* Depending on actual local conditions, extended maximum recoating intervals may apply.  
Please contact HEMPEL for further advice.

Furthermore, please see page 3.



**HEMPADUR 45141/45143**

**Physical data  
versus temperature:**

(HEMPADUR 45143 in a dry film thickness of 150 micron/6 mils):

|  |              |              |           |           |
|--|--------------|--------------|-----------|-----------|
| Surface temperature  | -10°C/14°F   | 0°C/32°F     | 10°C/50°F | 20°C/68°F |
| Drying time  | 35 hours     | 14 hours     | 7 hours   | 4 hours   |
| Curing time  | 2 months     | 28 days      | 14 days   | 7 days    |
| <b>MINIMUM recoating interval related to later conditions of exposure:</b> |              |              |           |           |
| <b>Interval for recoating with 46410, 56360</b>                            |              |              |           |           |
| Atmospheric, medium  | 28 hours     | 14 hours     | 6 hours   | 3 hours   |
| Atmospheric, severe  | 36 hours     | 18 hours     | 8 hours   | 4 hours   |
| <b>Interval for recoating with 58030</b>                                   |              |              |           |           |
| Atmospheric, medium  | Not relevant | Not relevant | 12 hours  | 6 hours   |
| Atmospheric, severe  | Not relevant | Not relevant | 12 hours  | 6 hours   |
| <b>Interval for recoating with HEMPADUR and HEMPATHANE qualities</b>       |              |              |           |           |
| Atmospheric, medium  | 36 hours     | 18 hours     | 8 hours   | 4 hours   |
| Atmospheric, severe  | 45 hours     | 23 hours     | 10 hours  | 5 hours   |
| Immersion*   | 54 hours     | 27 hours     | 12 hours  | 6 hours   |
| <b>MAXIMUM recoating interval related to later conditions of exposure:</b> |              |              |           |           |
| <b>Interval for recoating with 46410</b>                                   |              |              |           |           |
| Atmospheric, medium  | 4 days       | 45 hours     | 20 hours  | 10 hours  |
| Atmospheric, severe  | 4 days       | 45 hours     | 20 hours  | 10 hours  |
| <b>Interval for recoating with 56360</b>                                   |              |              |           |           |
| Atmospheric, medium  | 2½ days      | 34 hours     | 15 hours  | 7½ hours  |
| Atmospheric, severe  | 2½ days      | 34 hours     | 15 hours  | 7½ hours  |
| <b>Interval for recoating with 58030</b>                                   |              |              |           |           |
| Atmospheric, medium  | Not relevant | Not relevant | 6 days    | 3 days    |
| Atmospheric, severe  | Not relevant | Not relevant | 3 days    | 1½ days   |
| <b>Interval for recoating with HEMPADUR qualities</b>                      |              |              |           |           |
| Atmospheric, medium  | None         | None         | None      | None      |
| Atmospheric, severe  | None         | None         | None      | None      |
| Immersion**  | (90 days)    | 90 days      | 60 days   | 30 days   |
| <b>Interval for recoating with HEMPATHANE qualities</b>                    |              |              |           |           |
| Atmospheric, medium  | 90 days      | 45 days      | 20 days   | 10 days   |
| Atmospheric, severe  | 30 days      | 15 days      | 6 days    | 3 days    |

\* Not relevant for HEMPATHANE qualities.

\*\* Depending on actual local conditions, extended maximum recoating intervals may apply. Please contact HEMPEL for further advice.

Furthermore, please see page 3.