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 Wa 2 to 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 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 full coating 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 paint material 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.

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, ½" internal diameter max. 30 metres/100 feet, 3/8" internal diameter 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 paint material 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.

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 smoother at drying this extra wet film thickness readings will not cause 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 - 4514350630C0005/45141506 30C0007

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.

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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
MINIMUM recoating interval related to later conditions of exposure:		
Interval recoating with 46410, 56360		
Atmospheric, medium	6 hours	3 hours
Atmospheric, severe	8 hours	4 hours
Interval for recoating with 58030		
Atmospheric, medium	11 hours	6 hours
Atmospheric, severe	11 hours	6 hours
Interval for recoating with HEMPADUR and HEMPATHANE qualities		
Atmospheric, medium	8 hours	4 hours
Atmospheric, severe	9 hours	5 hours
Immersion*	12 hours	6 hours
MAXIMUM recoating interval related to later conditions of exposure:		
Interval for recoating with 46410		
Atmospheric, medium	12 hours	6 hours
Atmospheric, severe	12 hours	6 hours
Interval for recoating with 56360		
Atmospheric, medium	10 hours	5 hours
Atmospheric, severe	10 hours	5 hours
Interval for recoating with 58030		
Atmospheric Medium	3 days	36 hours
Severe	1½ days	18 hours
Interval for recoating with HEMPADUR qualities		
Atmospheric, medium	None	None
Atmospheric, severe	None	None
Immersion**	30 days	15 days
Interval for recoating with HEMPATHANE qualities		
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
MINIMUM recoating interval related to later conditions of exposure:				
Interval for recoating with 46410, 56360				
Atmospheric, medium	28 hours	14 hours	6 hours	3 hours
Atmospheric, severe	36 hours	18 hours	8 hours	4 hours
Interval for recoating with 58030				
Atmospheric, medium	Not relevant	Not relevant	12 hours	6 hours
Atmospheric, severe	Not relevant	Not relevant	12 hours	6 hours
Interval for recoating with HEMPADUR and HEMPATHANE qualities				
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
MAXIMUM recoating interval related to later conditions of exposure:				
Interval for recoating with 46410				
Atmospheric, medium	4 days	45 hours	20 hours	10 hours
Atmospheric, severe	4 days	45 hours	20 hours	10 hours
Interval for recoating with 56360				
Atmospheric, medium	2½ days	34 hours	15 hours	7½ hours
Atmospheric, severe	2½ days	34 hours	15 hours	7½ hours
Interval for recoating with 58030				
Atmospheric, medium	Not relevant	Not relevant	6 days	3 days
Atmospheric, severe	Not relevant	Not relevant	3 days	1½ days
Interval for recoating with HEMPADUR qualities				
Atmospheric, medium	None	None	None	None
Atmospheric, severe	None	None	None	None
Immersion**	(90 days)	90 days	60 days	30 days
Interval for recoating with HEMPATHANE qualities				
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.