

For product description refer to product data sheet 35560

Scope: These Application Instructions cover surface preparation, application equipment, and application details for HEMPADUR 35560.

Surface preparation: Steel:
Abrasive blasting to min. Sa 2½ with a surface profile corresponding to ISO Comparator Rough Medium (G). Oil and grease must be removed with suitable detergent, salts and other contaminants by (high pressure) fresh water hosing prior to blasting. After blasting, clean the surface carefully from abrasives and dust. HEMPADUR 15590 may be used as a blast primer/hold-coat (see page 4).

On-board maintenance with minor repairs:

Oil and grease must be removed with suitable detergent, salts and other contaminants by high pressure fresh water hosing. Areas to be repaired by application of touch-up coating to be cleaned by manual power tool disc grinding down to a cleanliness degree equivalent to St3 as per ISO 8501-1:2007.

Intact coating in surrounding areas being repaired must be feathered and adjacent surface must be sanded in order to ensure good adhesion of the newly applied coating system.

Old steel:

On old steel surfaces having been exposed to salt water, excessive amounts of salt residues in pittings may call for dry abrasive blasting, high pressure fresh water hosing, drying, and finally, dry abrasive blasting again. Alternatively, water jetting may be used provided the steel surface has already the surface profile as described above.

In case of extensively pit-corroded surfaces (tank bottoms):

Remove oil and grease with suitable detergent. Blasting to Sa 2, ISO 8501-1: 2007. Pittings on tank bottoms are often omega-shaped (typically in the case of chloride-induced corrosion) for which reason the following procedure is recommended:

After rough cleaning for dust and abrasives, the tank surfaces are to be thoroughly high pressure fresh water hosed. Let the water remain in the tank so that all pit corroded areas are covered by approximately 5 cm/2" of water.

After 24 hours the water is removed by wet vacuum cleaning and the tank is dried. If needed, i.e. if there is still salt contamination to be found in the pits, the washing treatment has to be repeated. After cleaning, the surfaces are blasted to min. Sa 2½ with a surface roughness profile as described above. After blasting clean the surface carefully for abrasives and dust. Special care must be taken when cleaning the tank bottom.

Concrete:

The concrete must be of good quality and fully cured, eg 28 days for normal Portland cement, and completely dry with a humidity content in the surface below 4%. The concrete must also be controlled for absence of capillary water action or for subsoil water.

Minimum pull-off value should normally be 20 kilopond/cm² measured after surface preparation. Any cracks, crevices and voids must be repaired.

All possible slip agent, oil, grease and other contaminants must be removed by e.g. abrasive blasting, volatilising by flame cleaning or treating with suitable detergent. The treatment with suitable detergent should be carried out in the following way: saturate the surface with fresh water. Wash with suitable detergent and then hose down with fresh water.

Depending on construction and purpose, abrasive blast, high pressure water jet or treat the concrete with power tools to obtain a rough and firm surface free of scum layer and other contamination. Remove dust and loose material.

If mechanical treatment is impossible, the surface may be treated with acid etching. For this purpose an approx. 5% w/w nitric or phosphoric acid solution is recommended.

Note: when using strong acids, take necessary precautions, make sure that safety regulations are obeyed!

Prior to etching the concrete should be saturated with fresh water to prevent acid corrosion of the reinforcement bars. Leave the acid to act for 3-4 minutes and hose down the surface with fresh water - preferably first a 5% w/w sodium hydroxide solution - and scrub carefully. After that the surface must dry homogeneously and appear as an even, rough surface free of a loose outer layer. The surface must have a pH reaction of between 6.5-8.0. If any of these conditions are not fulfilled, the process must be repeated. The surface must be dried with good ventilation for at least 2 days at 65% relative humidity and 20°C/68°F.

The pre-treatment is controlled by scraping with a strong knife. The surface must feel solid and hard, and the knife must only leave a clear scratch mark.
 Seal the surface with HEMPADUR SEALER 05990 in such a way that the surface is **just saturated**. **Surplus must be removed** (do also see the Product Data sheet for HEMPADUR SEALER 05990).

Application equipment: HEMPADUR 35560, being a solvent free, high viscosity material, requires special measures to be taken at application.

Recommended airless spray equipment:

Pump ratio:	min 45:1 (See Note below)
Pump output:	12 litres/minute (theoretical)
Input pressure:	min 6 bar/90 psi
Spray hoses:	max 15 metres/50 feet, 3/8" internal diameter max 3 metres/10 feet, 1/4" internal diameter
Regular surfaces:	
Nozzle size:	0,021"-0,027"
Fan angle:	40°-60°
Complicated surfaces (tanks):	
Nozzle size:	0,019" through 0,023"
Fan angle:	40°
Airless spray data are indicative and subject to adjustment.	

Note: Avoid the use of a suction hose. Use an interchangeable pipe, which makes it possible to remove cured paint. If longer spray hoses are necessary the pump ratio must be raised to 60:1 or more, yet the high output capacity of the pump must be maintained.

Thinning: **Do not thin.**

Pit-corroded surfaces: In case of extensive pit corrosion (old tank bottoms) it is advisable to apply the first coat by brush. The coating must be worked well into all pits facilitating a good wetting of the steel and closing the porosities. The following coat(s) can be applied by brush as well as by airless spray (as per above) securing full covering of the uneven/rough surface.

Pot life: When measured under standard conditions the pot life is 1 ½ hour at 20°C/68°F. However, for a 20 litres/5 US gallons mix, the heat developed by the chemical reaction between BASE and CURING AGENT is so intense that the corresponding practical pot life is **substantially shorter**.

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.
- Keep an eye on the paint temperature frequently for instance by touching the can with your hand. If it feels more than hand warm, discard the paint and flush the equipment immediately irrespective of type of spray equipment.

Paint temperature: If the in-can temperature is below approximately 15°C/59°F viscosity will be too high for application. If the paint temperature at mixing is 25°C/77°F or higher a substantial risk of shortened pot life and curing in can/spray equipment exists. **When working in warm, subtropical/ tropical climates a refrigerated container can be used for storing/ cooling of the paint before application.**

Application: **Film-build/continuity:** Hempadur 35560 may be used in one-coat and two coat specifications. Especially in one-coat specifications it is of great importance that a continuous, pinhole-free paint film is obtained. 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. The usual way of obtaining this result is to spray-coat all these areas separately followed by a full coat all over. Furthermore, stripe coating by brush will typically be required. 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.

The paint layer must be applied homogeneously and as close to the specification as possible. The consumption of paint must be controlled to avoid exaggerated film thickness, e.g. by controlling paint consumption and/or measuring wet film thickness. The finished coating must appear as a homogeneous film with a smooth surface and irregularities such as dust, dry spray, abrasives, should be remedied.

Wet/dry film thickness: Due to thixotropic nature, the surface tension of the product and entrapped air after spray application, there will often be a deviation between the measured wet film thickness (WFT) and the later measured dry film thickness (DFT).

In practice this can be compensated by applying approx. 50 µm WFT extra in addition to the specified DFT. The extra wet film thickness will compensate the wavy surface structure that will become smoother upon curing as well as entrapped air that is released during curing. This extra wet film thickness will consequently not cause a higher paint consumption.

Stripe coating: Edges, corners, manual welds, and places difficult to cover properly by spray application should be stripe coated (touched up) either before or after the spray application.

One or two stripe coats will usually be necessary, but depending on actual conditions.

Extra film thickness: Extra thickness - extra layer(s) - may be necessary in case of severely pitted steel.

Overcoating intervals **HEMPADUR 35560** in a dry film thickness of 200 micron/8 mils with a relative humidity of 85%:

Environment	Immersion													
	10°C/50°F		15°C/59°F		20°C/68°F		25°C/77°F		30°C/86°F		35°C/95°F		40°C/104°F	
Overcoat with quality type:	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
HEMPADUR	40 h	75 d	28 h	51 d	16 h	30 d	16 h	21 d	8 h	15 d	7 h	10 d	5 h	9 d

d= days; h=hour(s)

Before recoating, the layer of HEMPADUR 35560 must NOT be exposed to (steel) temperatures below 10°C/50°F, to condensing humidity or to relative humidity higher than 85% before recoating.

At low temperature (10°C-15°C / 50°F-59°F), the relative humidity should be 60% or lower during the first 2 days of curing, also before recoating.

Curing table: The following curing times apply:

Steel temperature:	10°C/50°F	15°C/59°F	20°C/68°F	25°C/77°F	30°C/86°F	35°C/95°F	40°C/104°F
Fully cured	14 days	11 days	7 days	6 days	4 days	3.5 days	3 days

Time before taking into use: For new tanks and new pipelines or full refurbishment of tanks or pipelines: HEMPADUR 35560 should be fully cured before taken into use.

For minor maintenance and repair: Reduced curing time is accepted as per below table:

Steel temperature:	10°C/50°F	15°C/59°F	20°C/68°F	25°C/77°F	30°C/86°F	35°C/95°F	40°C/104°F
Curing time before "take into use"	6 days	5 days	3 days	3 days	2 days	1.5 days	1.5 days

Note: HEMPADUR 35560 must not be exposed to water or high humidity between stripe coating and full coating respectively between full coating and any necessary second full coating as there is a certain risk of curing agent exudation which will hinder adhesion. If exudation is present on the surface this must be removed by very thorough cleaning. Cleaning should be carried out by hand-warm fresh water washing at a pressure of approx 60 bar. Such cleaning must not take place before the minimum curing time for obtaining water resistance as listed above has elapsed. Contact the nearest Hempel office for further details.

Ventilation during application: Ventilation is not required for drying/curing of the coating, but some ventilation is recommended in order to remove e.g. spray dust from application.

Use with a primer: When used in combination with primer HEMPADUR 15590, the WRAS approval is valid for the following conditions: 3 days overcoat interval at 20°C and 7 days curing at 20°C after application of the last coat.

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 - 35560

These Application Instructions supersede those previously issued.
For explanations, definitions and scope see "Explanatory Notes" available on www.hempel.com. 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. The Products are supplied and all technical assistance is given subject to Hempel's general conditions of sales, delivery and service, unless otherwise expressly agreed in writing. The Manufacturer and Seller disclaim, and Buyer and/or User waive all claims involving, any liability, including but not limited to negligence, except as expressed in said general conditions for all results, injury or direct or consequential losses or damages arising from the use of the Products as recommended above, on the overleaf or otherwise. Product data are subject to change without notice and become void five years from the date of issue.