Application Instructions
HEMPADUR MASTIC 4588W
4588W: BASE 45889 with CURING AGENT 9588W

For product description refer to product data sheet HEMPADUR MASTIC 4588W

Scope:

These Application Instructions cover surface preparation, application equipment and application details for HEMPADUR MASTIC 4588W.

Surface preparation:

General: In order to obtain best performance, abrasive blast cleaning is recommended. However, HEMPADUR MASTIC 4588W has “surface tolerant” properties and offers higher performance than many other coatings when applied to surfaces mechanically cleaned only (salts, oil, grease etc. shall always be removed).

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

NEW STEEL:
When used as intermediate and/or finishing coat, surface preparation according to Product Data Sheet for the preceding primer coat (HEMPADUR primers). When used as a selfpriming coat, surface preparation according to specification.

When applied to GALVOSILS:
HEMPADUR MASTIC 4588W can be applied when the GALVOSIL is cured. Consult APPLICATION INSTRUCTIONS for the relevant GALVOSIL. Remove oil and grease etc. with suitable detergent. Remove salt and other contaminants by high pressure fresh water cleaning. After exposure to high humidity, zinc salts, "white rust", must be removed carefully by high pressure fresh water cleaning, if necessary combined with scrubbing with stiff nylon brushes.

REPAIR AND MAINTENANCE:

Spot-repairs:
Clean damaged areas thoroughly by power tool cleaning to minimum St 2 (spot-repairs) or by abrasive blasting to minimum Sa 2, preferably Sa 2½. Improved surface preparation will improve the performance of HEMPADUR MASTIC 4588W. As an alternative, water jetting to minimum Wa 2½ (ISO 8501-4:2006)(or according to specification) may be used. A flash-rust degree of maximum M (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 MASTIC 4588W **may** be used in connection with other generic paint systems than epoxy and polyurethanes.
It is recommended to make a test patch. 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.

Full coating:

Compatibility with old system: In general full compatibility can be expected with old epoxy systems. A test patch should always be performed before full coating is decided. If the old epoxy is not weathered/chalked or if it is topcoated with polyurethane, it is recommended to roughen the surface before overcoating. Furthermore, very thorough cleaning is a must. Any dirt, chalked surface material, oil and grease should be removed with suitable detergent followed by high pressure fresh water hosing of the entire surface.

Removal of old system: Full coating after complete mechanical removal of an old paint system is possible too. Yet, it must be considered that mechanical cleaning by disc grinding or by rotating wire brushing may produce a very smooth surface which reduce the adhesive forces of the primer coat.

Note: Another risk is remains of a hard black rust scale being cleaned to an apparent brightness without showing any adhesive defects. Yet, the exposure to open air during cleaning may have started a further 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, repair:
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 (minor areas) or by abrasive blasting to min. Sa 2, preferably Sa 2½. Improved surface preparation will improve the performance of HEMPADUR MASTIC 4588W. As an alternative to dry cleaning, water jetting to minimum Wa 2½ (ISO 8501-4:2006), may be used. A flash rust degree of M, preferably L (ISO 8501-4:2006) is acceptable before application. Feather edges to sound intact areas. Dust off residues. Touch up to full film thickness.
Note: On old steel surfaces having been exposed to salty 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 MASTIC 4588W being a high solids and a relatively 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:	minimum mesh size 250 µm/ 10 mil

Regular surfaces:	Complicated surfaces (and touch up):
Nozzle size: .021" through .023"	Nozzle size: .017" through .021"
Fan angle: 60°	Fan angle: 40°

After finishing the application, clean the equipment immediately with THINNER 08450 or HEMPEL'S TOOL CLEANER 99610.

Note: Increasing hose diameter may ease 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 5-10% THINNER 08450 may be added, but thinning must be done with care as the maximum obtainable film thickness is reduced significantly by over-thinning.

Airless spray data are indicative and subject to adjustment.

Induction time: Should the paint temperature as an exception be 15°C/59°F or below, it is an advantage to allow the two components to prereact before application. This is especially relevant in the case of substrate temperatures also being below 15°C/59°F.

In case of a paint or substrate temperature at 15°C/59°F, an induction time of 15 minutes is recommended. In case of a paint or substrate temperature at 10°C/50°F, an induction time of 25 minutes is recommended. In order to obtain proper application properties, the paint temperature should preferably never be below 10°C/50°F. Yet for substrate temperatures below 10°C/50°F an induction time of 30 minutes is recommended.

Spray 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 application of a stripe coat will therefore be good painting practice. 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 homogeneously 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 and irregularities such as dust, dry spray, abrasives, should be remedied.

Brush and roller application: At application with hand tools, brush, but especially by roller the natural tendency to a more uneven paint film obtained by these methods, is to be counteracted by more coats applied. If at all possible each coat is to be applied across the preceding one - in general follow good painting practise.

On **poorly prepared surfaces** it is always recommended to apply the 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: Please note that the thixotropic nature of HEMPADUR MASTIC 4588W 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 during drying these extra wet film thickness readings will not cause a higher paint consumption than otherwise stipulated.

Film thickness/thinning: HEMPADUR MASTIC 4588W is normally specified in 125-200 micron/5-8 mils. Depending on ambient conditions, usually maximum 5% thinning with THINNER 08450 is relevant, however, increasing at high temperatures to ensure proper film formation and avoid dust spray. May be specified down to 75 micron/3 mils. To obtain optimum film formation in film thicknesses lower than 125 micron/5 mils dry film thickness additional thinning with 5-10% THINNER 08450 is recommended.

Pot life: When measured under standard conditions the pot life is 1 hour at 20°C/68°F for HEMPADUR MASTIC 4588W. However, for a 20 litres/5 US gallons mix, and used under warm climate conditions, the heat developed by the chemical reaction between BASE and CURING AGENT may make the corresponding practical pot life shorter.
Therefore: At high temperatures, use the paint immediately after mixing irrespective of equipment.

Physical data Versus temperature:

HEMPADUR MASTIC 4588W in a dry film thickness of 200 micron/8 mils:

Surface temperature:	-10°C/15°F	0°C/32°F	10°C/50°F	20°C/68°F	30°C/86°F	40°C/104°F
Drying time (approx)	54hours	27 hours	12 hours	6 hours	5 hours	4 hours
Curing time (approx)	2½ months	1 month	14 days	7 days	5 days	3 days

MINIMUM overcoating interval related to later conditions of exposure:

Interval for overcoating with HEMPADUR and HEMPATHANE qualities

Atmospheric, medium	63 hours	28 hours	16 hours	7 hours	5 hours	4 hours
Atmospheric, severe	3,5 days	40 hours	23 hours	10 hours	8 hours	6 hours
Immersion[1]	3,5 days	40 hours	23 hours	10 hours	8 hours	6 hours

[1.] Not relevant for HEMPATHANE qualities.

Notes:
- Avoid sudden drops in (substrate) temperatures during drying/initial curing. It is especially important that the substrate temperature does not drop significantly before application of the acrylic or polyurethane finish and that proper ventilation is maintained.
- If faster handling or overcoating at lower temperatures is required, HEMPADUR 45143 may be used.
- In case of low temperatures, it is recommended that HEMPADUR MASTIC 4588W has been given a proper
  induction time before application. Under such conditions, consider paint temperature equal to substrate temperature and follow the rules given on page 2.
- Please note that overcoating intervals in Presale specifications and other recommendations may differ from the above due to specific overcoating product, service conditions and application circumstances.

HEMPADUR MASTIC 4588W (independent on dry film thicknesses):

Surface temperature:	-10°C/15°F	0°C/32°F	10°C/50°F	20°C/68°F	30°C/86°F	40°C/104°F

MAXIMUM overcoating interval related to later conditions of exposure:

Interval for overcoating with HEMPADUR and HEMPATHANE qualities

Atmospheric, medium	63 days	28 days	15.5 days	7 days	5 days	4 days
Atmospheric, severe	63 days	28 days	15.5 days	7 days	5 days	4 days
Immersion[1]	63 days	28 days	15.5 days	7 days	5 days	4 days

[1.] Not relevant for HEMPATHANE qualities.

Notes:
- Avoid sudden drops in (substrate) temperatures during drying/initial curing.
- If faster handling or overcoating at lower temperatures is required, HEMPADUR 45143 may be used.

Extended overcoating intervals can be utilised when the following is strictly observed:

- The surface shall be thoroughly cleaned from all sorts of contaminants including invisible deposits of water soluble salts, oil, grease and similar harmful chemical substances.
- Surfaces having any degraded layer from exposure to UV radiation, heat etc. must have this layer removed by mechanical cleaning methods like, water jetting, abrading or sweep blasting.

- The existing coating system must in all respects be sound and applied according to Product Data Sheets, Application Instructions and Specification.

It should be recognised that the optimal intercoat adhesion is best ensured by observing the interval between the stated minimum and “Cured Time”. Utilising extended overcoating intervals it should further be understood that by chemical nature the intercoat adhesion between HEMPADUR qualities are better than between HEMPADUR and HEMPATHANE qualities. To determine whether the quality of the surface cleaning is adequate, a test patch may be relevant. However, such a test is not the final proof of long-term durability, but if the result is doubtful, repeated cleaning will be relevant. A more safe solution could be to refresh the surface with a new thin (diluted) coat of HEMPADUR MASTIC 4588W.

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.

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