

47510: BASE 47519 with CURING AGENT 98510

For product description refer to product data sheet 47510

Scope: These Application Instructions cover surface preparation, application equipment and application details for HEMPADUR ULTRA-STRENGTH FIBRE 47510 when used as a coating for cargo holds of dry bulk carriers.

Surface preparation: Newbuildings:

For optimum performance the following is recommended:

Pores in welds to be sufficiently open to allow penetration of the paint. Undercuts, sharp edges of end craters to be avoided. Careful stripe coating or filling should be carried out.

All sharp edges to be broken or rounded. Laminations to be removed. Rolled profiles, etc. from the steel mills normally have acceptably rounded edges.

All loose weld spatters to be removed. Well adhering, scattered weld spatter is acceptable, but will need additional touch-up. If dense, they must be removed by grinding.

Further reference is made to ISO 8501-3:2006, surface preparation grade P2.

Welds and damages to be abrasive grit blasted to minimum Sa 2, ISO 8501-1:2007. Approved zinc silicate shop primer to be removed to Sa 2. Other types of shop primer to be removed to minimum Sa 2½. The surface profile to be equivalent to Rugotest No. 3, BN10, Keane-Tator Comparator, 3.0 G/S or ISO 8503-1:2007, MEDIUM (G). Oil and grease must be removed with suitable detergent, salts and other contaminants by (high pressure) fresh water hosing prior to blasting.

Block assembly zones must be treated with great care. Damage caused by possible over-blasting must be avoided, paint edges must be feathered and consecutive layers of paint coatings given greater and greater overlaps. Roughening may become necessary if the maximum overcoating interval is exceeded.

Block assembly zones are preferably to be abrasive spot-blasted. However, mechanical cleaning to St 3 may be acceptable if zones are narrow and an extra coat of HEMPADUR ULTRA-STRENGTH FIBRE 47510 diluted approx. 10-15% is applied to these areas as the first coat.

Abrasive residues and visible dust must be removed.

Major refurbishments and repairs:

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 ULTRA-STRENGTH FIBRE 47510. 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

The fresh water cleaning will assist in removing salt residues, yet total removal of salts embedded in the pits will in practise, on large areas, be extremely difficult irrespective of method of cleaning.

47510: BASE 47519 with CURING AGENT 98510

Application equipment: HEMPADUR ULTRA-STRENGTH FIBRE 47510, 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 Max. 30 metres/ 100 feet, 3/8" internal diameter Max. 6 metres/ 20 feet, 1/4" internal diameter
Filter:	60 mesh
Regular surfaces:	Corrugated bulkheads, hoppers and similar large regular areas
Nozzle size:	0,023"-0,027"
Fan angle:	60-80°
Complicated surfaces:	
Nozzle size:	0,023"
Fan angle:	40°

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

Note: Increasing spray 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% 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:

It is especially important that a continuous, pinhole-free paint film is obtained at application of each spray applied 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, and to have a proper, uniform distance of the spray gun to the surface, 30-50 cm should be aimed at. Furthermore, the viscosity of the paint must be suitable for obtaining proper and steady atomising. 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.

Dry film thickness:

The time to first loading of cargo, particular hard, angular cargoes, as well as general performance are strongly influenced by the dry film thickness. The total dry film thickness should be between 80% and 200% of the specified dry film thickness or between 200 micron/8 mils and 500 micron/20 mils for a 250 micron/10 mils specification. The average dry film thickness should not exceed 350 micron/14 mils. A maximum of 220% of the specified dry film thickness or 550 micron/22 mils is acceptable for areas with complicated design (rear side of shell frames and brackets). Sagging, particularly in corners and along edges must be remedied.

Frequent control of wet film thickness during application as well as dry film thickness between coats is strongly recommended.

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

Stripe coating: Apply one or two stripe coats as a uniform, coherent film showing good film formation without excessive brush or roller marks in order to avoid entrapped air and subsequent popping.

Pot life/mixing/induction time: When measured under standard conditions the pot life is 2 hours at 15°C/59°F and 1 hours 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 may make the corresponding practical pot life shorter.

- Mix the entire content of corresponding base and curing agent packings. If it is necessary to mix smaller portions, this must be done properly, preferably by weighing base and curing agent. The weight ratio for HEMPADUR ULTRA-STRENGTH FIBRE 47510 is 8.4 parts by weight of base and

47510: BASE 47519 with CURING AGENT 98510

1.6 part by weight of curing agent. The mixing rate by volume is 3.0 parts of base and 1.0 part of curing agent.

- b. Stir the mixed paint thoroughly by means of a clean mechanical mixer until a homogeneous mixture is obtained.
- c. Use all mixed paint before the pot life is exceeded. The pot life depends on the temperature of the paint as shown in table below (valid for a 20 litres can):

Temperature of mixed paint	15°C/59°F ¹⁾	20°C/68°F	25°C/77°F	30°C/86°F ²⁾
Pot life	1.5 hours	1 hour	3/4 hour	(½ hour)

1) At 15°C/59°F and below, the viscosity can be too high for airless spray application.

2) Temperatures above 30°C/86°F should preferably be avoided.

Induction time:

The paint material itself should preferably be min 15°C/59°F. At steel temperatures below 5°C/41°F the paint may advantageously be pre-reacted 10 minutes before spray application (longer pre-reaction time at lower steel temperatures).

When two-component spray equipment is used, heating may be relevant to obtain a proper spray fan and a uniform and smooth paint film. This can either be done by preheating the two-component paint or by using a flow-heater on the pressure side. As an indication, a paint temperature of approx. 40°C/104°F will be relevant, but has to be adjusted according to the actual conditions.

Physical data versus temperature:

HEMPADUR ULTRA-STRENGTH FIBRE 47510 in a dry film thickness of 125 micron/5 mils:

Surface temperature	5°C/41°F	10°C/50°F	20°C/68°F	30°C/86°F
Surface-dry	12 hours	9 hours	2.5 hours	1.5 hours
Curing time*	7 days	5 days	3 days	2.5 days
Initial curing*	6 days	4 days	2 days	1.5 days

* exposure to water: ask for special instructions.

Overcoating intervals with HEMPADUR qualities in a dry film thickness of 125 micron/5 mils:

Surface temperature:	0°C/32°F	10°C/50°F	20°C/68°F	30°C/86°F	40°C/104°F
Minimum overcoating interval					
Atmospheric, medium	18 hours	8 hours	4 hours	3 hours	2 hours
Atmospheric, severe	18 hours	8 hours	4 hours	3 hours	2 hours
MAXIMUM overcoating interval					
Atmospheric, medium	30 days	30 days	14 days	10 days	7 days
Atmospheric, severe	30 days	30 days	14 days	10 days	7 days

Ventilation:

Correct film formation depends on adequate ventilation during drying.

The total volume of solvent vapour released until the coating is completely dry is 27 litres for one litre of undiluted HEMPADUR ULTRA-STRENGTH FIBRE 47510.

The lower explosive limit, LEL, is 0.6%.

To reach a common safety requirement of 10% LEL, the theoretical ventilation requirement is 45 m³ per litre paint.

Time to first cargo:

"Time to first cargo" for a coating applied strictly according to Hempel's specifications is the minimum curing time required before loading.

47510: BASE 47519 with CURING AGENT 98510

The "time to first cargo" depends on the type of cargo as well as the curing temperature of the coating as depicted in the following tables. Examples of hard angular cargoes are coal, iron and bauxite; and of soft cargoes are peanut shells or soya beans.

Carriage of hard, angular cargoes must only take place after the coating has been exposed to a minimum curing temperature of 5°C/41°F. Required minimum curing times before loading the first cargo are presented in the table below.

The "time to first cargo" also depends occasionally on the loading temperature as reflected on below tables according with remark (1).

Values for time to first cargo to be modified as per below:

Hard cargoes:

Surface Temperature	5°C/ 41°F	10°C/ 50°F	15°C/ 59°F	20°C/ 68°F	25°C/ 77°F	30°C/ 86°F
Time to first cargo	25 days	8 days	6 days	4 days	3 days	3 days

Soft cargoes ⁽¹⁾:

Surface Temperature	-10°C/ 14°F	-5°C/ 23°F	0°C/ 32°F	5°C/ 41°F	10°C/ 50°F	15°C/ 59°F	20°C/ 68°F	25°C/ 77°F	30°C/ 86°F
Time to first cargo	21 days	14 days	7 days	5 days	3 days	2 days	2 days	1 day	1 day

(1) Restricted to a maximum cargo temperature of 25°C/77°F

Note: For conditions not stated in the tables please contact HEMPEL for further information.

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:

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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.