



MI04683 Rev 07

OFFSHORE PAINTING SPECIFICATION

ISO 12944 CATEGORY C5M/C5I HIGH DURABILITY

BS4800 00-A-05 GREY

This specification covers the required methods and areas of responsibility for the preparation and painting of Rotork electric valve actuators (not insulated)

REVISION HISTORY

Created: 01/04/2015

Created By: J. Chivers

Checked by: P. Whiller

REVISION	DESCRIPTION	DATE	INITIALS
01	First Issue	01/04/15	J.C.
02	High durability references added	08/01/15	J.C.
03	Reference section updated to state ISO 19840 instead of ISO 2808.	04/05/16	J.C.
04	Steel shot permitted for ferrous gearboxes	09/06/16	J.C.
05	Hempel specification sheet added to appendix A	14/02/17	J.C.
06	C5I added	21/07/17	J.C.
07	Product data sheets added	14/11/19	J.C.

SECTION 1 – SCOPE

This specification covers the required methods and areas of responsibility for the preparation and painting of Rotork electric valve actuators & products (not insulated).

SECTION 2 – REFERENCE DOCUMENTS

REFERENCE DOCUMENT	TITLE
ISO 4624	Pull off test for adhesion
ISO 8501-1	Preparation of steel substrates before application of paints and related products -- Visual assessment of surface cleanliness -- Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 8502-3	Preparation of steel substrates before application of paints and related products -- Tests for the assessment of surface cleanliness - - Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)
ISO 8502-6	Preparation of steel substrates before application of paints and related products -- Tests for the assessment of surface cleanliness - - Part 6: Extraction of soluble contaminants for analysis -- The Bresle method
ISO 8502-9	Preparation of steel substrates before application of paints and related products -- Tests for the assessment of surface cleanliness - - Part 9: Field method for the conductometric determination of water-soluble salts
ISO 8503	Preparation of steel substrates before application of paints and related products
ISO 19840	Paints and varnishes -- Corrosion protection of steel structures by protective paint systems -- Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces

SECTION 3 – APPLICABILITY

This specification is applicable to Rotork valve actuators and accessories. It is the joint responsibility of Rotork and Global coatings or Amitec to ensure compliance to this specification.

SECTION 4 – HEALTH & SAFETY

All equipment, abrasive material and paints shall be used in accordance with the manufacturer's safety data sheets and appropriate safety precautions should be taken.

Data sheets can be obtained from the paint manufacturers' website

SECTION 5 – GENERAL REQUIREMENTS

5.1 Equipment Protection

All equipment shall be fully protected from mechanical damage and ingress of abrasives and dust from blast cleaning. Adjacent areas not to be painted or already finished should be protected from paint over spray by suitable masking.

5.2 Ambient Conditions

No final blast cleaning or coating application shall be undertaken if:

- 5.2.1 The relative humidity is more than 85%
- 5.2.2 The steel temperature is less than 3°C above the dew point.
- 5.2.3 The ambient conditions are outside those stated in the paint manufacturer's data sheet for each coating.
- 5.2.4 Coatings shall only be applied or cured at ambient and steel temperatures above 7°C or otherwise recommended by paint supplier.

5.3 Daily Log

A daily log containing, but not limited to the following data shall be submitted for each actuator and included in the final documentation package:

- 5.3.1 Air and steel surface temperature.
- 5.3.2 Relative humidity (in %)
- 5.3.3 Calculated dew point temperature
- 5.3.4 Degree of surface preparation, cleanliness and roughness
- 5.3.5 Time for start and finish of blast cleaning & each paint coat
- 5.3.6 Identification / name of applicator
- 5.3.7 Paint film thickness measurements (min., max. and average) for each coat.
- 5.3.8 Batch number of paint.
- 5.3.9 Adhesion test
- 5.3.10 Surface salt test
- 5.3.11 Visual examination
- 5.3.12 Non conformances and repair

6. SURFACE PREPARATION

6.1 Pre-Blasting Preparation

- 6.1.1 Valve actuator should be inspected for any sharp edges (radius > 2mm). If any sharp edges are present contact Rotork Controls Ltd before work proceeds.
- 6.1.2 All surfaces shall be washed with fresh clean water prior to blast cleaning to remove any foreign matter.
- 6.1.3 All surfaces shall then be washed with solvents in accordance with SSPC/SSPM Volume 2, grade SP1, prior to blast cleaning. The solvent must be suitable to remove and/ or neutralize any contamination of cooling-liquid left on the surface. Solvent de-greasing shall be followed with a further fresh water clean down to remove any solvent traces.

6.2 Abrasive Blasting

- 6.2.1 Ferrous substrates are to be blast cleaned in accordance with ISO 8501-1 grade Sa 3.0, blast profile 50-85 microns. The surface profile shall be graded in accordance with ISO8503. Aluminium oxide shall be used as blast medium, which shall be dry, clean and free from contamination. For ferrous gearboxes it is also permitted to use steel shot as a blast medium.
- 6.2.2 Non-ferrous substrates to be sweep blasted using an aluminium oxide abrasive.

6.3 Final Surface Condition

- 6.3.1 Surfaces to be coated shall be clean, dry, free from oil / grease and have the specified roughness and cleanliness until the first coat is applied. Dust, blast abrasives etc. shall be removed from the surface after blast cleaning such that the particle quantity and particle size do not exceed rating 2 of ISO8502-3.
- 6.3.2 Blasted surfaces shall be checked for soluble impurities using ISO 8502-6 and distilled water, shall not exceed a conductivity measured in accordance with ISO 8502-9 corresponding to a NaCl content of 20mg/m².

7. PROCEDURE FOR MASKING OFF ACTUATORS

The following shall be masked

- 7.1 Actuator local position indicator window
- 7.2 Drive bush, mounting base face, spigot & stud holes.
- 7.3 Any galvanized components are to be masked and left unpainted.

8. INSPECTION OF BLASTED SURFACES

Inspection of blasted surfaces shall be as follows:

TEST	METHOD	FREQUENCY	ACCEPTANCE CRITERIA
VISUAL EXAMINATION	Look for sharp edges & rust grade etc.	100% for all surfaces	No defects
CLEANLINESS	ISO 8501-1	100% visual check for all surfaces	Sa 3.0
	ISO 8502-3	Each batch	Maximum quantity and size rating 2
SALT TEST	ISO 8502-6	Each batch	Maximum conductivity corresponding to 20mg/m ² NaCl
	ISO 8502-9		
ROUGHNESS	ISO 8503	Each batch	50 – 85 microns

9. CERTIFICATION OF BLASTED SURFACES

Results of inspection and testing of blasted surfaces as detailed in section 8 shall be certified by recording results in the daily log.

10. QUALIFICATION REQUIREMENTS

Qualification of Paint Operators and Inspectors

Operators shall be experienced and proficient in surface preparation and coating application techniques. Personnel shall have relevant knowledge of health and safety hazard, use of protective equipment, coating materials, mixing and thinning coatings, coating pot life, surface requirements etc.

Personnel carrying out inspection or verification shall be certified as a NACE Coating Inspector or equivalent e.g. ICORR.



11. PAINTING SYSTEMS

Rotork Actuators contain both ferrous and non-ferrous metals therefore two paint systems are listed.

Paint system in accordance with ISO 12944 C5M/C5I High Durability >15 years corrosion resistance

NON-FERROUS METALS (I.E. ALUMINIUM) – FINAL COLOUR BS4800 00-A-05 GREY

Sweep blast using an aluminium oxide abrasive

Coating No.	Manufacturer	Product description	Product name	Certification	Min DFT
1	Hempel	Epoxy, High Build	Hempadur Mastic 45880	ISO 12944	120 microns min
2	Hempel	Epoxy, High Build	Hempadur Mastic 45880	ISO 12944	120 microns min
3	Hempel	Polyurethane	Hempathane HS 55610	ISO 12944	80 microns min
TOTAL				Tolerance Min	320 microns
				Max	640 microns

Paint system in accordance with ISO 12944 C5M/C5I High Durability >15 years corrosion resistance**FERROUS METALS (I.E. IRON/ STEEL) – FINAL COLOUR BS4800 00-A-05 GREY**

All surfaces to be blast cleaned to ISO 8501-1 SA 3.0 using an aluminium oxide abrasive

Coating No.	Manufacturer	Product description	Product name	Certification	Min DFT
1	Hempel	Epoxy, High Build	Hempadur Mastic 45880	ISO 12944	120 microns min
2	Hempel	Epoxy, High Build	Hempadur Mastic 45880	ISO 12944	120 microns min
3	Hempel	Polyurethane	Hempathane HS 55610	ISO 12944	80 microns min
TOTAL				Tolerance Min	320 microns
				Max	640 microns

12. PAINT APPLICATION

- 12.1** Before commencement of painting, measure and record the air temperature, relative humidity and establish the dew point within the painting workshop
- 12.2** Painting shall commence within four hours of blast cleaning.
- 12.3** Each paint coat within the system is to be applied in accordance with the paint manufacturer's instructions.
- 12.4** Paint thickness shall be checked for each coat on each actuator.
- 12.5** For each coat, a stripe coat shall be applied by brush to all welds, corners etc, and areas not fully reachable by spray in order to obtain the specified coverage thickness.
- 12.6** Contrasting colors shall be used for each coat of paint.

12A. POST PAINTING PROCESSES

- 12A.1** The metal masking battery plug TO4592 is to be removed & the black plastic plug supplied with the unit refitted & tightened to a torque of 8Nm.

13. INSPECTION AND TESTING

Inspection and testing requirements shall be as follows:

TYPE OF TEST	METHOD	FREQUENCY	ACCEPTANCE
Environmental conditions	Ambient temperature	Before the start of each shift plus a minimum of twice per shift	7 - 35°C
	Steel temperature		3°C above the dew point
	Dew point		Do not proceed if temperature is less than 3°C above the dew point
	Relative humidity		Humidity to be 85% maximum
Visual examination of coating	Curing	100% of surface after each coat	As per product data sheets
	Contamination		
	Solvents		
	Pinholes/Popping		
	Sagging		
	Surface defects		
Film thickness	ISO 19840 Calibration on smooth surface	ISO 19840	See section 11 for DFT limits
Adhesion	ISO 4624	At least once per day	Minimum adhesion 5.00MPa
	To be carried out when system is fully cured Use of test panels is acceptable		

14. REPAIR PROCEDURE

If paint repair is required, the following procedure should be followed:

- 14.1** Clean surface using solvent if necessary.
- 14.2** Rinse surface with clean fresh water to remove any foreign matter and traces of solvent.
- 14.3** Abrade area using wet and dry paper and feather edges of sound intact paint around area by 2.5 cm
- 14.4** Apply paint system as per section 11 ensuring that dft limit is met and time is allowed for each coat to cure as per the paint manufacturer's data sheets.

15. CERTIFICATION OF PAINTING

Results of coating inspection and testing, as detailed in section 13 shall be certified by recording results in the daily log. The paint report shall be issued with the final documentation package.

Specification sheet

HEMPEL A/S



Project: ISO 12944 C5I & C5M High Durability

Area:

C5I & C5M Environment

Surface preparation:

Oil and grease etc. to be removed by emulsion cleaning. Entire area to be (high pressure) fresh water cleaned in order to remove salts and other contaminants. When the surface is dry: Abrasive blasting to minimum Sa 2½ according to ISO 8501-1:2007 with a surface profile corresponding to ISO 8503-2 comparator "Medium" (60-100micron Rz)

Coating Repair System.

Re-instate as per original specification, take care to ensure edges of damages are abraded to provide an even transition onto sound coating. Overlap areas around damages should be roughened to provide a suitable key.

Product name (including quality number)	Treated area %	Colour	Shade no.	Film thickness (micron)		Theoretical spreading rate (sqm/lt)	Application methods			Recommended	
				Wet	Dry		Brush	Roller	Spray	Nozzle orifice	Nozzle pressure
HEMPADUR MASTIC 45880	f/c 100	Alu grey	19870	150	120	6,5	(X)	(X)	X	.017"- .023"	250 bar
HEMPADUR MASTIC 45880	f/c 100	To Be Advised	T.B.A	150	120	6,7	(X)	(X)	X	.017"- .023"	250 bar
HEMPATHANE HS 55610	f/c 100	To Be Advised	T.B.A	125	80	8,4	X	X	X	.017"- .021"	175 bar
t/u: touch up f/c: full coat s/c: stripe coat				320			X: Recommended (X): Possible				

Recoating intervals. Ample ventilation

Quality no	D.F.T. (micron)	Recoated with quality no	Hrs=Hour(s)		Mth=Month(s)		N/R=Not Recommended		20°C	10°C		0°C		-10°C	
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.
45880	120	45880	5 Hrs	Ext	7 Hrs	Ext	10 Hrs	Ext	29 Hrs	Ext	29 Hrs	3½ Day	Ext	7 Day	Ext
45880	120	55610	5 Hrs	40 Hrs	7 Hrs	54 Hrs	10 Hrs	72 Hrs	29 Hrs	9 Day	3½ Day	27 Day	7 Day	52 Day	Ext

Remarks and Product information see next page.

Hempel's PreSale System 2.6.17 (Build 929)
 Printed at: 18.07.2017 12:00
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 User name: Mandy Young
 Department name: Sales
 Quality Code: 34-12 / 0717
 Environment: Severe
 Page: 1

Specification sheet

HEMPEL A/S



Project: ISO 12944 C5I & C5M High Durability

Area:

C5I & C5M Environment

Remarks:

Normal good painting practice must be followed throughout the entire painting procedure.

Maximum thinner of 5%

Full cure time can be found on the relevant Hempel PRODUCT DATA SHEET

Maximum Dry Film Thickness (maximum individual reading value) per coat:

HEMPADUR MASTIC 45880 X 2 - 240µm

HEMPATHANE HS 55610 - 160µm

Total system thickness should not exceed 640µm

The mean average should not exceed 480µm

Product information:		Shade no.	Volume solids %	Curing agent	Mixing ratio volume	Pot life 20°C	Dry to touch 20°C	Flash point °C	Thinner	Application restrictions Min. Temp. Max. RH%	
HEMPADUR MASTIC 45880	19870	78	95880	3 : 1	1 h	4 h	39	39	08450	-5	85
HEMPADUR MASTIC 45880	T.B.A.	80	95880	3 : 1	1 h	4 h	39	39	08450	-5	85
HEMPATHANE HS 55610	T.B.A.	67	97050	7 : 1	2 h	5 h	31	31	08080	-10	85

The data, specifications, directions and recommendations (hereinafter "information") given in this painting specification are based upon test results obtained under controlled or specifically defined conditions and said information is correct to the best of our knowledge. The User must satisfy itself that it is appropriate to use the Product in accordance with the information in the actual conditions under which the Product is intended to be used, and the Manufacturer and Seller do not guarantee the accuracy, completeness or appropriateness of the information when the Product is used in those conditions. The provisions regarding Hempel's liability in its applicable conditions for sale, delivery and service shall apply to any and all claims arising out of or in connection with the use of the products recommended above, overleaf or otherwise.

Hempel's PreSale System 2.6.17 (Build 929)

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GBMDY0585N Page: 2

User name: Mandy Young

Department name: Sales

Quality Code: 34-12 / 0717

Environment : Severe

APPENDIX B – PRODUCT DATA SHEETS

Product Data HEMPADUR MASTIC 45880



45880: BASE 45889: CURING AGENT 95880

Description:	HEMPADUR MASTIC 45880 is a two-component polyamide adduct cured, high solids, high build epoxy paint. It forms a hard and tough coating, has good wetting properties and low temperature curing.
Recommended use:	As a selfprimed, surface tolerant paint system or as an intermediate or finishing coat in heavy duty paint systems where low VOC and high film build are required. For immersed areas HEMPADUR MASTIC 45880 is only recommended for minor repairs as primer, and full applications as intermediate or topcoat. Can be specified where extended recoating properties for polyurethane topcoats are requested (typically travel coating). May be used directly on cured zinc silicate (GALVOSIL products) or spray-metallized surfaces to minimize popping. Shade 18800 can be used in paint systems complying with European ATEX Regulation EN 13463-1: 2001, please consult Hempel for specification advice. Please also note that Shade 18800 will have a lower gloss than usual for other shades.
Service temperature:	Maximum, dry exposure only: 120°C/248°F.
Certificates/Approvals:	In accordance with Aramco's specification APCS 1, APCS 12, APCS 26 and 26T. Tested according to section 175.300 of the Code of Federal Regulations Title 21 - Dry Foodstuff. Consult Hempel for details. Complies with European Fire Standard EN 13501-1; classification B-s1, d0. Tested for non-contamination of grain cargo at the Newcastle Occupational Health & Hygiene, Great Britain. Approved as a low flame spread material when used as part of a predefined paint system. Please refer to "Declaration of Conformity" on www.Hempel.com for further details. Complies with EU Directive 2004/42/EC: subcategory j.
Availability:	Part of Group Assortment. Local availability subject to confirmation.
PHYSICAL CONSTANTS:	
Shade nos/Colours:	12170* / Grey. (see REMARKS overleaf)
Finish:	Semi-gloss
Volume solids, %:	80 ± 1
Theoretical spreading rate:	6.4 m²/l [256.6 sq.ft./US gallon] - 125 micron/5 mils
Flash point:	25 °C [77 °F]
Specific gravity:	1.5 kg/litre [12.1 lbs/US gallon]
Dry to touch:	4 hour(s) 20°C/68°F
Fully cured:	14 day(s) 10°C/50°F
VOC content:	216 g/l [1.8 lbs/US gallon]
Shelf life:	3 years for BASE and 3 years (25°C/77°F) for CURING AGENT from time of production. *Wide range of colours available via Hempel's MULTI-TINT system. <i>The physical constants stated are nominal data according to the HEMPEL Group's approved formulas.</i>
APPLICATION DETAILS:	
Version, mixed product:	45880
Mixing ratio:	BASE 45889: CURING AGENT 95880 3 : 1 by volume
Application method:	Airless spray / Brush
Thinner (max.vol.):	< 5% HEMPEL'S THINNER 08450, depending on purpose (see REMARKS overleaf)
Pot life (Airless spray):	1 hour 20°C/68°F
Pot life (Brush):	2 hour(s) 20°C/68°F
Nozzle orifice:	0.017 - 0.023 " (According to separate APPLICATION INSTRUCTIONS)
Nozzle pressure:	250 bar [3625 psi]
Cleaning of tools:	HEMPEL'S TOOL CLEANER 99610
Indicated film thickness, dry:	125 micron [5 mils] (see REMARKS overleaf)
Indicated film thickness, wet:	150 micron [6 mils]
Overcoat interval, min:	see REMARKS overleaf
Overcoat interval, max:	see REMARKS overleaf
Safety:	Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Safety Data Sheets and follow all local or national safety regulations.

Product Data

HEMPADUR MASTIC 45880



SURFACE PREPARATION:

New steel: Abrasive blasting to minimum Sa 2½ (ISO 8501-1:2007) with a surface profile corresponding to Rugotest No. 3, N9a to N10, preferably BN9a to BN10, Keane-Tator Comparator, 2.0 G/S or ISO Comparator, Medium (G).

Zinc silicate painted or spray-metallized surfaces: Remove oil and grease, etc. with suitable detergent. Remove salt and other contaminants by (high pressure) fresh water cleaning. Zinc salts (white rust) must be removed by high pressure hosing combined with rubbing with a stiff nylon brush if necessary. It is recommended to recoat spray-metallized surfaces as soon as possible to avoid possible contamination.

Concrete: Remove slip agent and other possible contaminants by emulsion washing followed by high pressure hosing with fresh water. Remove scum layer and loose matter to a hard, rough and uniform surface, preferably by abrasive blasting, possibly by other mechanical treatment or acid etching. Seal surface with suitable sealer, as per relevant painting specification.

Repair and maintenance: Remove oil and grease etc. thoroughly with suitable detergent. Remove salts and other contaminants by high pressure fresh water cleaning. Clean damaged areas thoroughly by power tool cleaning to minimum St 2 (spot-repairs) or by abrasive blasting to min. Sa 2, preferably to Sa 2½ (ISO 8501-1:1988). Improved surface preparation will improve the performance of the product. 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).

Acceptable flash-rust degree before application: maximum M (atmospheric exposure) / M, preferably L (immersion) (ISO 8501-4:2006).

Feather edges to sound and intact areas. Dust off residues. Touch up to full film thickness. On pit-corroded surfaces, excessive amounts of salt residues may call for high pressure water jetting, wet abrasive blasting or, 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. Use only where application and curing can proceed at temperatures above: - 5°/23°F, preferably above 0°C/32°F. The temperature of paint itself should be 15°C/59°F or above. In confined spaces provide adequate ventilation during application and drying.

PRECEDING COAT:

None, or as per specification.

SUBSEQUENT COAT:

None, or as per specification.

REMARKS:

VOC - EU Directive 2004/42/EC:

Product	As supplied	5 vol. % thinning	Limit phase II, 2010
4588012170	216 g/l	248 g/l	500 g/l

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

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.

Application(s):

Application onto zinc silicate or spray-metallized surfaces (thinning): It is recommended to apply the paint by using a "mist-coat" procedure provided the paint temperature is approximately above: 20°C/68°F. A thin, undiluted coat is applied (the mist coat) and after a few minutes, a second coat is applied in the full specified film thickness. If the paint temperature is below: 20°C/68°F, thinning (max 15%) may be required.

Film thicknesses/thinning:

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 overcoating interval. Normal range dry is: 100-200 micron/4-8 mils. May be specified in lower film thickness for which purpose additional thinning is required, please see separate APPLICATION INSTRUCTIONS. **Avoid application of excessive film thicknesses.**

Shades:

The product is also available in a Micaceous Iron Oxide (MIO) pigmented shade (Shade no. 12430 – reddish grey).

Overcoating:

This product is available in several aluminium pigmented shades with different volume solids content. Overcoating intervals related to later conditions of exposure: If the maximum overcoating interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion.

Before overcoating after exposure in contaminated environment, clean the surface thoroughly with high pressure fresh water hosing and allow drying.

A specification supersedes any guideline overcoat intervals indicated in the table.

Environment	Atmospheric, medium					
	0°C (32°F)		10°C (50°F)		20°C (68°F)	
	Min	Max	Min	Max	Min	Max
HEMPADUR	54 h	Ext.	18 h	Ext.	6 h	Ext.
HEMPATEX	54 h	4.5 d	18 h	36 h	6 h	12 h
HEMPATHANE	54 h	Ext.	18 h	Ext.	6 h	Ext.
Immersion						
HEMPADUR	4.5 d	90 d	36 h	90 d	12 h	30 d

NR = Not Recommended, Ext. = Extended, m = minute(s), h = hour(s), d = day(s)

Overcoating intervals:

A specification supersedes any guideline overcoat intervals indicated in the table.

Product Data

HEMPADUR MASTIC 45880



Note: **HEMPADUR MASTIC 45880 For professional use only.**
ISSUED BY: **HEMPEL A/S**

4588012170

This Product Data Sheet supersedes 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 overcoat or otherwise. Product data are subject to change without notice and become void five years from the date of issue.

Product Data

HEMPATHANE HS 55610



55610: BASE 55619: CURING AGENT 97050

Description:	HEMPATHANE HS 55610 is a two-component glossy acrylic polyurethane topcoat, cured with aliphatic isocyanate, with good gloss and colour retention. Contains zinc phosphate.
Recommended use:	As a VOC-compliant, high-build finishing coat for protection of structural steel in severely corrosive environment. May be specified as a one coat "Direct To Metal" system in environments classified as C2 and C3.
Service temperature:	Maximum, dry exposure only: 120°C/248°F see REMARKS overleaf
Certificates/Approvals:	Approved as a low flame spread material when used as part of a predefined paint system. Please refer to "Declaration of Conformity" on www.Hempel.com for further details. Complies with EU Directive 2004/42/EC: subcategory j.
Availability:	Part of Group Assortment. Local availability subject to confirmation.
PHYSICAL CONSTANTS:	
Shade nos/Colours:	10000/ White. (see REMARKS overleaf)
Finish:	Glossy
Volume solids, %:	67 ± 1
Theoretical spreading rate:	6.7 m ² /l [288.7 sq.ft./US gallon] - 100 micron/4 mils
Flash point:	31 °C [87.8 °F]
Specific gravity:	1.4 kg/litre [12 lbs/US gallon]
Surface-dry:	3 hour(s) 20°C/68°F
Through-dry:	8 hour(s) 20°C/68°F
Fully cured:	7 day(s) 20°C/68°F
VOC content:	337 g/l [2.8 lbs/US gallon]
Shelf life:	3 years for BASE and 2 years (25°C/77°F) for CURING AGENT from time of production. *Wide range of colours available via Hempel's MULTI-TINT system. *other shades according to assortment list. <i>The physical constants stated are nominal data according to the HEMPEL Group's approved formulas.</i>
APPLICATION DETAILS:	
Version, mixed product:	55610
Mixing ratio:	BASE 55619: CURING AGENT 97050 7:1 by volume
Application method:	Airless spray/ Brush
Thinner (max.vol.):	08080 (5%) / 08080 (5%)
Pot life:	2 hour(s) 20°C/68°F
Nozzle orifice:	0.017 - 0.021 "
Nozzle pressure:	175 bar [2537.5 psi] (Airless spray data are indicative and subject to adjustment)
Cleaning of tools:	HEMPEL'S THINNER 08080
Indicated film thickness, dry:	100 micron [4 mils] / 4 mils (see REMARKS overleaf)
Indicated film thickness, wet:	150 micron [6 mils] / 6 mils
Overcoat interval, min:	see REMARKS overleaf
Overcoat interval, max:	see REMARKS overleaf
Safety:	Handle with care. Before and during use, observe all safety labels on packaging and paint containers, consult HEMPEL Safety Data Sheets and follow all local or national safety regulations.

Product Data

HEMPATHANE HS 55610



SURFACE PREPARATION:

New steel: Remove oil and grease etc. thoroughly with suitable detergent. Remove salts and other contaminants by high pressure fresh water cleaning. Abrasive blasting to minimum Sa 2½ (ISO 8501-1:2007) with a surface profile corresponding to Rugotest No. 3, min.AN10b. Apply immediately after cleaning. All damage of shopprimer and contamination from storage and fabrication should be thoroughly cleaned prior to overcoating. **Steel, 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 (minor areas) or by abrasive blasting to min. Sa 2, preferably to Sa 2½. Improved surface preparation will improve the performance of the paint. 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), preferably L (immersion) (ISO 8501-4:2006) is acceptable before application. Feather edges to sound and intact paint. Dust off residues. Touch up to full film thickness. On pit-corroded surfaces, excessive amounts of salt residues may call for water jetting or wet abrasive blasting, alternatively dry abrasive blasting followed by 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. Minimum temperature for curing is: -10°C/14°F. At the freezing point and below be aware of the risk of ice on the surface, which will hinder adhesion. The film formation may be adversely affected by light rain, high humidity and/or condensation during application and the following interval after application: 8 hours, 20°C/68°F. In confined spaces provide adequate ventilation during application and drying.

PRECEDING COAT:

According to specification. Recommended systems are: HEMPADUR AVANTGUARD 1738G / 1734G / 17382 / 17990, HEMPADUR MASTIC 45880/45881

SUBSEQUENT COAT:

None.

REMARKS:

VOC - EU Directive 2004/42/EC:

Product	As supplied	5 vol. % thinning	Limit phase II, 2010
5561010000	337 g/l	363 g/l	500 g/l

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

Colours/Colour stability:

Colour stability for some shades may be effected by exposure to harsh chemical atmospheres. This does not affect the performance of the coating. For certain colours extra coats may be necessary to obtain full opacity. For aluminium pigmented shades scratching actions or high humidity/water may cause discolouration/disturbances of the surface. This will have no influence on the performance. This phenomenon may be avoided by applying a clear varnish.

Weathering/service temperatures:

At service temperature above 100°C/212°F, slight discolouration may be expected. The product will become softer.

Application(s):

When specified as a one coat "Direct to Metal"-system follow "Good Painting Practice" and apply stripe coating before the spray application on areas difficult to cover properly by spray application. CURING AGENT 97050 : is sensitive to moisture.

Film thickness/thinning:

Even small traces of water in the mixed paint will reduce the pot life and result in film defects. 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 overcoating interval. Normal range dry is: minimum 50 micron/2 mils (diluted), minimum 75 micron/3 mils (undiluted), maximum 125 micron/5 mils. Store in a dry place and keep the can tightly closed until use.

Storage Conditions:

Shades:

This product is available in several aluminium pigmented shades with different volume solids content. Contact HEMPEL for more information.

Curing agent:

Open curing agent cans with caution as overpressure might exist.

Overcoating:

Overcoating intervals related to later conditions of exposure: If the maximum overcoating interval is exceeded, roughening of the surface is necessary to ensure intercoat adhesion. Before overcoating after exposure in contaminated environment, clean the surface thoroughly with high pressure fresh water hosing and allow drying.

A specification supersedes any guideline overcoat intervals indicated in the table.

Environment	Atmospheric, medium					
Surface temperature:	-10°C (14°F)		0°C (32°F)		20°C (68°F)	
	Min	Max	Min	Max	Min	Max
HEMPATHANE	30 h	None	18 h	None	6 h	None

NR = Not Recommended, Ext. = Extended, m = minute(s), h = hour(s), d = day(s)

Overcoating note:

A completely clean surface is mandatory to ensure intercoat adhesion, especially at long overcoating intervals. Any dirt, oil, grease, and other foreign matter must be removed with suitable detergent followed by (high pressure) fresh water cleaning. Salts to be removed by fresh water hosing. To check whether the quality of the surface cleaning is adequate, a test patch may be relevant.

Note:

HEMPATHANE HS 55610 For professional use only.

ISSUED BY:

HEMPEL A/S

5561010000

Product Data

HEMPATHANE HS 55610



This Product Data Sheet supersedes 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.

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