



SIGMAGUARD CSF 650

6 pages

 April 2009
 Revision of November 2008

DESCRIPTION

two component solvent free amine cured epoxy coating

PRINCIPAL CHARACTERISTICS

- tank coating for crude oil/ballast and aliphatic petroleum products
- also suitable as coating system for storage and transport of drinking water
- good resistance to various chemicals
- one coat protection for steel structures, ships and storage tanks with excellent corrosion resistance
- can be applied by heavy duty single feed airless spray equipment (60:1)
- reduced explosion risk and fire hazard
- good visibility due to light colour
- also a conductive version is available, see sheet 7753
- can be reinforced with chopped glassfibre or mat
- clear version for glassmat reinforced solvent free tank bottom system (see system sheet 4144)
- meets the requirements of Mil-C-4556E concerning resistance against aircraft fuel and fuel degradation

COLOURS AND GLOSS

green, offwhite, clear - gloss

BASIC DATA AT 20°C

 (1 g/cm³ = 8.25 lb/US gal; 1 m²/l = 40.7 ft²/US gal)
 (data for mixed product)

Mass density	1.3 g/cm ³
Volume solids	100%
VOC (supplied)	max. 109 g/kg (Directive 1999/13/EC, SED) max. 143 g/l (approx. 1.2 lb/gal) see information sheet 1411
Recommended dry film thickness	300 - 600 µm depending on system
Theoretical spreading rate	3.3 m ² /l for 300 µm *
Touch dry after	8 hours
Overcoating interval	min. 24 hours * max. 20 days *
Full cure after	5 days *

(data for components)

Shelf life (cool and dry place)

 at least 12 months
 * see additional data

RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

- steel; blast cleaned to ISO-Sa2½, blasting profile 50 - 100 µm
- suitable primer; SigmaGuard 260, SigmaCover 280, SigmaPrime series or SigmaCover 522, depending on system requirements
- substrate temperature must be above 5°C and at least 3°C above dew point during application and curing

SYSTEM SPECIFICATION

marine	1 x 300 µm SigmaGuard CSF 650
or suitable primer (min. dft of 50 µm) +	1 x 250 µm SigmaGuard CSF 650

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INSTRUCTIONS FOR USE	<p>mixing ratio by volume: base to hardener 80 : 20</p> <ul style="list-style-type: none"> - the temperature of the mixed base and hardener should preferably be above 20°C - at lower temperature the viscosity will be too high for spray application - no thinner should be added - for recommended application instructions: see working procedure
Induction time	none
Pot life	<p>approx. 1 hour at 20°C *</p> <p>* see additional data</p>
AIRLESS SPRAY	<ul style="list-style-type: none"> - use heavy duty single feed airless spray equipment preferably 60:1 pump ratio and suitable high pressure hoses - in-line heating or insulated hoses may be necessary to avoid cooling down of paint in hoses at low air temperature - application with 45:1 airless spray equipment is possible provided in-line heated high pressure hoses are used - in case of using 45:1 airless spray equipment the paint must be heated to approx. 30°C in order to obtain the right application viscosity - length of hoses should be as short as possible
Recommended thinner	no thinner should be added
Nozzle orifice	approx. 0.53 - 0.64 mm (= 0.021 - 0.025 in)
Nozzle pressure	<p>at 20°C (paint temperature) min. 28 MPa (= approx. 280 bar; 4000 p.s.i.)</p> <p>at 30°C (paint temperature) min. 22 MPa (= approx. 220 bar; 3000 p.s.i.)</p>
BRUSH/ROLLER	for stripe coating and spot repair only
Recommended thinner	no thinner should be added
CLEANING SOLVENT	<p>Thinner 90-83 (preferred) or Thinner 90-53</p> <ul style="list-style-type: none"> - all equipment used for application must be cleaned immediately after use - paint inside the spraying equipment must be removed before the pot life time has been expired
SAFETY PRECAUTIONS	<p>for paint and recommended thinners see safety sheets 1430, 1431 and relevant material safety data sheets</p> <p>although this is a solvent free paint, care should be taken to avoid inhalation of spray mist as well as contact between the wet paint and exposed skin or eyes</p> <ul style="list-style-type: none"> - no solvent present; however, spray mist is not harmless, a fresh air mask should be used during spraying - ventilation should be provided in confined spaces to maintain good visibility

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ADDITIONAL DATA

Film thickness and spreading rate

theoretical spreading rate m ² /l	4.0	3.3	1.7
dft in µm	250	300	600

max. dft when brushing: 150 - 200 µm

measuring wet film thickness

- a deviation is often obtained between the measured apparent wft and the real applied wft
- this is due to the thixotropy and the surface tension of the paint which retards the release of air trapped in the paint film for some time
- recommendation is to apply a wft which is equal to the specified dft plus 60 µm

measuring dry film thickness

- because of low initial hardness the dft cannot be measured within some days due to the penetration of the measuring device into the soft paint film
- the dft should be measured using a calibration foil of known thickness placed in between the coating and the measuring device

Overcoating table for SigmaGuard CSF 650 for dft up to 300 µm

with itself

substrate temperature	5°C	10°C	20°C	30°C	40°C
minimum interval	80 hours	36 hours	24 hours	16 hours	12 hours
maximum interval	20 days	20 days	20 days	14 days	7 days

- surface should be dry and free from any contamination

Curing table for dft up to 300 µm

substrate temperature	dry to handle	full cure
5°C	60 hours	15 days
10°C	30 hours	7 days
20°C	16 hours	5 days
30°C	10 hours	3 days
40°C	8 hours	2 days

- adequate ventilation must be maintained during application and curing (please refer to sheets 1433 and 1434)
- for drinking water tanks, a tankwash should be carried out after full cure and before the tank goes into service

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- when used as coating system for storage and transport of drinking water the recommended working and washing procedure should be followed

WASHING PROCEDURE

The recommended washing procedure must be applied after completion of the application.

Sufficient time for full-curing and ventilation must be allowed in accordance with the recommendations as stated in the latest Product Data Sheets and working procedure.

Always an adequate washing procedure should be followed.

Several adequate washing procedures are available and may be used (see e.g. washing procedure described in relevant certificate).

Example of adequate washing procedures:

- 1.– after full curing of the system as per the latest PDS, the tank should be filled completely with fresh tap water
 - the fresh tap water should remain in the tanks at least 4 full days
 - afterwards all tank compartments such as inner hull sides, bottom and deckheads etc. should be thoroughly washed using high pressure water
 - after washing, the tanks should be thoroughly drained
 - after this procedure the tanks will be fit to carry drinking water
- 2.– all personnel should wear watertight suits, boots and gloves properly cleaned with a sodium hypochlorite solution (1% active chlorine per liter)
 - all tank sides, bottom and deckheads etc. should be brush cleaned or high-pressure spray cleaned with 1% active chlorine solution as above
note: this can also be done by butterworth washing
 - all parts should be high pressure cleaned with tap water and tanks drained
 - concentrated active chlorine solution should be sprinkled on bottom; approx. 1 ltr/10 m²
 - tanks should be filled with tap water to a depth of approx. 20 cm and the water should remain in the tank for at least 2 hours (max. 24 hours)
 - tanks should be thoroughly flushed out with tap water
 - depending upon local regulations it may be necessary to take water samples, after filling tank completely, to check on bacteria
 - after this procedure the tanks will be fit to carry drinking water

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Pot life (at application viscosity)

20°C	60 min.
30°C	45 min.
40°C	25 min.

- due to exothermic reaction, temperature during and after mixing may increase

Disclaimer for storage and transport of drinking water:

- SigmaGuard CSF 650 is approved for purpose in accordance with the requirements of the relevant certificate (see sheet 1882)
- PPG Protective & Marine Coatings does not accept any responsibility or liability for any odour, taste or contamination imparted to the drinking water from the coatings or products retained in the coating.

Worldwide availability

Whilst it is always the aim of PPG Protective & Marine Coatings to supply the same product on a worldwide basis, slight modification of the product is sometimes necessary to comply with local or national rules/circumstances. Under these circumstances an alternative product data sheet is used.

REFERENCES

Explanation to product data sheets	see information sheet 1411
Safety indications	see information sheet 1430
Safety in confined spaces and health safety	
Explosion hazard - toxic hazard	see information sheet 1431
Safe working in confined spaces	see information sheet 1433
Directives for ventilation practice	see information sheet 1434
Cleaning of steel and removal of rust	see information sheet 1490
Specification for mineral abrasives	see information sheet 1491

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LIMITATION OF LIABILITY

The information in this data sheet is based upon laboratory tests we believe to be accurate and is intended for guidance only. All recommendations or suggestions relating to the use of the Sigma Coatings products made by PPG Protective & Marine Coatings, whether in technical documentation, or in response to a specific enquiry, or otherwise, are based on data which to the best of our knowledge are reliable. The products and information are designed for users having the requisite knowledge and industrial skills and it is the end-user's responsibility to determine the suitability of the product for its intended use.

PPG Protective & Marine Coatings has no control over either the quality or condition of the substrate, or the many factors affecting the use and application of the product. PPG Protective & Marine Coatings does therefore not accept any liability arising from loss, injury or damage resulting from such use or the contents of this data sheet (unless there are written agreements stating otherwise).

The data contained herein are liable to modification as a result of practical experience and continuous product development.

This data sheet replaces and annuls all previous issues and it is therefore the user's responsibility to ensure that this sheet is current prior to using the product.

The English text of this document shall prevail over any translation thereof.

	PDS	7443
179131	green	4000002200
179511	clear	0000002200