

SIGMASHIELD™ 460

DESCRIPTION

Two-component, high solids glass flake reinforced polyamine adduct epoxy coating

PRINCIPAL CHARACTERISTICS

- Excellent abrasion and impact resistance
- Suitable for use on ice-going vessels
- Excellent resistance to corrosion
- Long-term protection at areas subject to heavy wear and tear
- Resistant to splash and spillage of a wide range of chemicals
- Very low water permeability, due to glass flake barrier

COLOR AND GLOSS LEVEL

- Black (other (light) colors on request)
- Gloss

BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.5 kg/l (12.5 lb/US gal)
Volume solids	81 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 165.0 g/kg max. 246.0 g/l (approx. 2.1 lb/US gal)
Recommended dry film thickness	250 - 400 µm (10.0 - 16.0 mils) depending on system
Theoretical spreading rate	3.2 m²/l for 250 µm (130 ft²/US gal for 10.0 mils) 2.0 m²/l for 400 µm (81 ft²/US gal for 16.0 mils)
Dry to touch	3 hours
Overcoating Interval	Minimum: 16 hours Maximum: 28 days
Full cure after	5 days
Shelf life	Base: at least 24 months when stored cool and dry Hardener: at least 24 months when stored cool and dry

Notes:

- See ADDITIONAL DATA – Spreading rate and film thickness
- See ADDITIONAL DATA – Overcoating intervals
- See ADDITIONAL DATA – Curing time



**PPG Protective &
Marine Coatings**

Bringing innovation to the surface.™

SIGMASHIELD™ 460

RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

Substrate conditions

- Steel; blast cleaned to ISO-Sa2½, blasting profile 40 – 70 µm (1.6 – 2.8 mils)
 - Previous coat must be dry and free from any contamination
-

IMO-MSC.215(82) requirements for water ballast tanks

- Dust quantity rating "1 for dust size class "3", "4" or "5", lower dust size classes to be removed if visible on the surface to be coated without magnification (ISO 8502-3:1992)
-

Substrate temperature and application conditions

- Substrate temperature during application and curing should be above 5°C (41°F)
 - Substrate temperature during application and curing should be at least 3°C (5°F) above dew point
-

SYSTEM SPECIFICATION

- ANTICORROSIVE SYSTEMS FOR UNDERWATER AND BOOTTOP - SYSTEM SHEET 3101
 - SYSTEMS FOR BOOTTOP AND TOPSIDE - SYSTEM SHEET 3102
-

INSTRUCTIONS FOR USE

Mixing ratio by volume: base to hardener 75:25 (3:1)

- The temperature of the paint should preferably be above 15°C (59°F), otherwise extra thinner may be required to obtain application viscosity
 - Adding too much thinner results in reduced sag resistance and slower cure
 - Very good mechanical mixing of base and hardener is essential
 - Thinner should be added after mixing the components
 - Filters should be removed from spray equipment
-

Induction time

None

Pot life

1.5 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life

SIGMASHIELD™ 460

Air spray

Recommended thinner

THINNER 91-92

Volume of thinner

5 - 10%, depending on required thickness and application conditions

Nozzle orifice

1.5 – 2.0 mm (approx. 0.060 – 0.079 in)

Nozzle pressure

0.3 - 0.4 MPa (approx. 3 - 4 bar; 44 - 58 p.s.i.)

Airless spray

Recommended thinner

THINNER 91-92

Volume of thinner

0 - 5%, depending on required thickness and application conditions

Nozzle orifice

Approx. 0.53 – 0.79 mm (0.021 – 0.031 in)

Nozzle pressure

19.0 - 22.5 MPa (approx. 190 - 225 bar; 2756 - 3264 p.s.i.)

Brush/roller

- Brush application only
 - Only for touch-up and repair
 - Due to thixotropy, it is difficult to obtain a smooth film by brush, although this does not affect performance
-

Cleaning solvent

THINNER 90-53

SIGMASHIELD™ 460

ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
250 µm (10.0 mils)	3.2 m ² /l (130 ft ² /US gal)
400 µm (16.0 mils)	2.0 m ² /l (81 ft ² /US gal)

Notes:

- Maximum DFT when brushing: 80 µm (3.1 mils)
- Maximum recommended dft for complex structures is 250 µm (10.0 mils)

Overcoating interval for DFT up to 400 µm (16.0 mils) itself						
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself	Minimum	48 hours	32 hours	16 hours	12 hours	8 hours
	Maximum	28 days	28 days	28 days	14 days	7 days

Note: Surface should be dry and free from chalking and contamination

Curing time for DFT up to 400 µm (16.0 mils)			
Substrate temperature	Dry to touch	Dry to handle	Service- water immersion
5°C (41°F)	16 hours	30 hours	14 days
10°C (50°F)	8 hours	16 hours	10 days
20°C (68°F)	3 hours	8 hours	5 days
30°C (86°F)	2 hours	5 hours	4 days
40°C (104°F)	1 hour	3 hours	3 days

Note: Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)

Pot life (at application viscosity)	
Mixed product temperature	Pot life
10°C (50°F)	3 hours
20°C (68°F)	1.5 hours
30°C (86°F)	45 minutes



PPG Protective & Marine Coatings

Bringing innovation to the surface.™

SIGMASHIELD™ 460

SAFETY PRECAUTIONS

- For paint and recommended thinners see INFORMATION SHEETS 1430, 1431 and relevant Material Safety Data Sheets
- This is a solvent-borne paint and care should be taken to avoid inhalation of spray mist or vapor, as well as contact between the wet paint and exposed skin or eyes

WORLDWIDE AVAILABILITY

It is always the aim of PPG Protective and Marine Coatings to supply the same product on a worldwide basis. However, 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

• CONVERSION TABLES	INFORMATION SHEET	1410
• EXPLANATION TO PRODUCT DATA SHEETS	INFORMATION SHEET	1411
• SAFETY INDICATIONS	INFORMATION SHEET	1430
• SAFETY IN CONFINED SPACES AND HEALTH SAFETY, EXPLOSION HAZARD – TOXIC HAZARD	INFORMATION SHEET	1431
• SAFE WORKING IN CONFINED SPACES	INFORMATION SHEET	1433
• DIRECTIVES FOR VENTILATION PRACTICE	INFORMATION SHEET	1434
• CLEANING OF STEEL AND REMOVAL OF RUST	INFORMATION SHEET	1490
• SPECIFICATION FOR MINERAL ABRASIVES	INFORMATION SHEET	1491
• RELATIVE HUMIDITY – SUBSTRATE TEMPERATURE – AIR TEMPERATURE	INFORMATION SHEET	1650

WARRANTY

PPG warrants (i) its title to the product, (ii) that the quality of the product conforms to PPG's specifications for such product in effect at the time of manufacture and (iii) that the product shall be delivered free of the rightful claim of any third person for infringement of any U.S. patent covering the product. THESE ARE THE ONLY WARRANTIES THAT PPG MAKES AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, UNDER STATUTE OR ARISING OTHERWISE IN LAW, FROM A COURSE OF DEALING OR USAGE OF TRADE, INCLUDING WITHOUT LIMITATION, ANY OTHER WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE DISCLAIMED BY PPG. Any claim under this warranty must be made by Buyer to PPG in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life of the product, or one year from the date of the delivery of the product to the Buyer, whichever is earlier. Buyer's failure to notify PPG of such non-conformance as required herein shall bar Buyer from recovery under this warranty.

LIMITATIONS OF LIABILITY

IN NO EVENT WILL PPG BE LIABLE UNDER ANY THEORY OF RECOVERY (WHETHER BASED ON NEGLIGENCE OF ANY KIND, STRICT LIABILITY OR TORT) FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO, ARISING FROM, OR RESULTING FROM ANY USE MADE OF THE PRODUCT. The information in this sheet is intended for guidance only and is based upon laboratory tests that PPG believes to be reliable. PPG may modify the information contained herein at any time as a result of practical experience and continuous product development. All recommendations or suggestions relating to the use of the PPG product, whether in technical documentation, or in response to a specific inquiry, or otherwise, are based on data, which to the best of PPG's knowledge, is reliable. The product and related information is designed for users having the requisite knowledge and industrial skills in the industry and it is the end-user's responsibility to determine the suitability of the product for its own particular use and it shall be deemed that Buyer has done so, as its sole discretion and risk. PPG has no control over either the quality or condition of the substrate, or the many factors affecting the use and application of the product. Therefore, PPG does not accept any liability arising from any loss, injury or damage resulting from such use or the contents of this information (unless there are written agreements stating otherwise). Variations in the application environment, changes in procedures of use, or extrapolation of data may cause unsatisfactory results. This sheet supersedes all previous versions and it is the Buyer's responsibility to ensure that this information is current prior to using the product. Current sheets for all PPG Protective & Marine Coatings Products are maintained at www.ppgpmc.com. The English text of this sheet shall prevail over any translation thereof.

The PPG Logo, Bringing innovation to the surface., and all other trademarks herein are property of the PPG group of companies.



**PPG Protective &
Marine Coatings**

Bringing innovation to the surface.™