

# PHENGUARD™ 930

## DESCRIPTION

Two-component, high-build, amine adduct-cured novolac phenolic epoxy holding primer

## PRINCIPAL CHARACTERISTICS

- Primer coat in the PHENGUARD tank coating system
- Excellent resistance to a wide range of organic acids, alcohols, edible oils, fats (regardless of free fatty acid content) and solvents
- Maximum cargo flexibility
- Low cargo absorption
- Good resistance to hot water
- Recognized corrosion control coating (Lloyd's register)
- Good application properties, resulting in a smooth surface

## COLOR AND GLOSS LEVEL

- Offwhite
- Eggshell

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.7 kg/l (14.2 lb/US gal)
Volume solids	66 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 191.0 g/kg max. 315.0 g/l (approx. 2.6 lb/US gal)
Recommended dry film thickness	100 µm (4.0 mils)
Theoretical spreading rate	6.6 m <sup>2</sup> /l for 100 µm (265 ft <sup>2</sup> /US gal for 4.0 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 36 hours Maximum: 21 days
Full cure after	See curing table
Shelf life	Base: at least 12 months when stored cool and dry Hardener: at least 12 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

# PHENGUARD™ 930

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Steel should be blast cleaned in situ to at least ISO-Sa2½
- Blasting profile 50 – 100 µm (2.0 – 4.0 mils)
- Steel must be free from rust, scale, shop primer and any other contamination
- The substrate must be perfectly dry before and during application of PHENGUARD 930

### Substrate temperature and application conditions

- Substrate temperature during application and curing should be above 10°C (50°F)
- Substrate temperature during application and curing should be at least 3°C (5°F) above dew point

## SYSTEM SPECIFICATION

- PHENGUARD 930 (offwhite): 100µm (4.0 mils)
- PHENGUARD 935 (pink): 100µm (4.0 mils)
- PHENGUARD 940 (gray): 100µm (4.0 mils)

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 88:12

- 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
- Thinner should be added after mixing the components

### Induction time

Allow induction time before use

Mixed product induction time	
Mixed product temperature	Induction time
15°C (59°F)	20 minutes
20°C (68°F)	15 minutes
25°C (77°F)	10 minutes

### Pot life

4 hours at 20°C (68°F)



# PHENGUARD™ 930

## Air spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

2.0 mm (approx. 0.079 in)

### **Nozzle pressure**

0.3 MPa (approx. 3 Bar; 44 p.s.i.)

---

## Airless spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

Approx. 0.46 – 0.53 mm (0.018 – 0.021 in)

### **Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

---

## Brush/roller

- Brush: for stripe coating and spot repair only

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 – 5%

---

## Cleaning solvent

THINNER 90-53

---



# PHENGUARD™ 930

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
100 µm (4.0 mils)	6.6 m <sup>2</sup> /l (265 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	5.3 m <sup>2</sup> /l (212 ft <sup>2</sup> /US gal)

Note: Maximum DFT when brushing: 60 µm (2.4 mils)

Overcoating interval for DFT up to 100 µm (4.0 mils)						
Overcoating with...	Interval	10°C (50°F)	15°C (59°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself and PHENGUARD 935	Minimum	60 hours	48 hours	36 hours	24 hours	16 hours
	Maximum	28 days	25 days	21 days	14 days	7 days

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 150 µm (6.0 mils)	
Substrate temperature	Minimum curing time before transport of cargoes without note 4, 7, 8 or 11 and ballast water or tank test with sea water
10°C (50°F)	14 days
15°C (59°F)	14 days
20°C (68°F)	10 days
30°C (86°F)	7 days
40°C (104°F)	5 days

### Notes:

- Minimum curing time of PHENGUARD tank coating system before transport of cargoes with note 4, 7, 8 or 11: 3 months
- For detailed information on resistance and resistance notes, please refer to the latest issue of the cargo resistance list
- For transport of methanol and vinyl acetate monomer, a hot cure is required, which cannot be substituted by a service period of 3-months with non-aggressive cargoes
- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)
- The performance of the applied system strongly depends on the curing degree of the first coat at time of recoating. Therefore overcoating time between 1st and 2nd coat is extended in comparison between 2nd and 3rd coat (see overcoating details)
- When used as a primer under solvent-free tank-linings the DFT must be limited to a maximum of 100 µm (4.0 mils)

Pot life (at application viscosity)	
Mixed product temperature	Pot life
10°C (50°F)	6 hours
20°C (68°F)	4 hours
30°C (86°F)	1.5 hours

# PHENGUARD™ 930

## 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
- This product contains a substance that is the subject of a TSCA 5a Significant New Use Rule (SNUR) [to be published]

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# SIGMAGUARD™ 720

## DESCRIPTION

Two-component, reinforced high solids tank coating, based upon polyamine adduct cured pure epoxy technology

## PRINCIPAL CHARACTERISTICS

- Tank coating with good chemical resistance against a wide range of chemicals
- Meets the requirements of EI 1541 2.2 (coating systems for aviation fuel storage tanks and pipes)
- Short curing periods
- Good low-temperature curing
- Easy to clean

## COLOR AND GLOSS LEVEL

- Light green, gray
- Gloss

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
<b>Number of components</b>	Two
<b>Mass density</b>	1.4 kg/l (11.7 lb/US gal)
<b>Volume solids</b>	78 ± 2%
<b>VOC (Supplied)</b>	Directive 1999/13/EC, SED: max. 163.0 g/kg max. 233.0 g/l (approx. 1.9 lb/US gal)
<b>Recommended dry film thickness</b>	125 - 160 µm (5.0 - 6.3 mils) depending on system
<b>Theoretical spreading rate</b>	6.2 m <sup>2</sup> /l for 125 µm (250 ft <sup>2</sup> /US gal for 5.0 mils)
<b>Dry to touch</b>	3 hours
<b>Overcoating Interval</b>	Minimum: 8 hours Maximum: 28 days
<b>Full cure after</b>	See curing table
<b>Shelf life</b>	Base: at least 12 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

# SIGMAGUARD™ 720

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Steel; blast cleaned to a minimum of ISO-Sa2½, blasting profile 40 – 70 µm (1.6 – 2.8 mils)
  - Previous coat must be dry and free from any contamination
  - Surface of previous coat should be sufficiently roughened if necessary
- 

### IMO-MSC.288(87) requirements for cargo tanks of crude oil tankers

- Steel; ISO 8501-3:2006 grade P2, with all edges treated to a rounded radius of minimum 2 mm (0.079 in) or subject to three pass grinding or at least equivalent process before painting
  - Steel; blast cleaned to ISO-Sa2½, blasting profile 30 – 75 µm (1.2 – 3.0 mils)
  - Dust quantity on the surface to be coated must not exceed rating "1" for dust size class "3", "4" or "5" (ISO 8502-3-2017). Lower dust size classes ("1" and/or "2") to be removed if visible without magnification.
- 

### 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

### System for chemical resistance according to the latest issue of the chemical resistance list.

- SIGMAGUARD 720: 125 µm (5.0 mils)
  - SIGMAGUARD 720: 125 µm (5.0 mils)
- 

### System for cargo tanks of Crude Oil Tankers according to IMO resolution MSC.288(87).

- SIGMAGUARD 720: 160 µm (6.3 mils)
  - SIGMAGUARD 720: 160 µm (6.3 mils)
- 

## INSTRUCTIONS FOR USE

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

- The temperature of the mixed base and hardener 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
  - Thinner should be added after mixing the components
-

# SIGMAGUARD™ 720

## **Induction time**

Allow induction time before use

<b>Mixed product induction time</b>	
<b>Mixed product temperature</b>	<b>Induction time</b>
15°C (59°F)	15 minutes
20°C (68°F)	10 minutes
25°C (77°F)	5 minutes

## **Pot life**

1.5 hours at 20°C (68°F)

## **Air spray**

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

5 - 15% for a one coat application of 125 µm (5.0 mils) DFT

### **Nozzle orifice**

1.8 - 2.0 mm (approx. 0.070 - 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 - 10% for a one coat application of 125 µm (5.0 mils) DFT

### **Nozzle orifice**

Approx. 0.53 - 0.69 mm (0.021 - 0.027 in)

### **Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

## **Brush/roller**

- For stripe coating and spot repair only





# SIGMAGUARD™ 720

## Cleaning solvent

THINNER 90-53

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
100 µm (4.0 mils)	7.8 m <sup>2</sup> /l (313 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	6.2 m <sup>2</sup> /l (250 ft <sup>2</sup> /US gal)
160 µm (6.3 mils)	4.9 m <sup>2</sup> /l (199 ft <sup>2</sup> /US gal)

Note: Maximum DFT when brushing: 100 µm (4.0 mils)

Overcoating interval for DFT up to 125 µm (5.0 mils)						
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	32 hours	24 hours	8 hours	4 hours	3 hours
	Maximum	28 days	28 days	28 days	14 days	7 days

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 125 µm (5.0 mils)		
Substrate temperature	Minimum curing time before transport of aliphatic petroleum products and ballast water and tanktest with seawater	Minimum curing time before transport of cargoes without note 4, 7, 8 or 11
5°C (41°F)	10 days	17 days
10°C (50°F)	7 days	14 days
15°C (59°F)	5 days	8 days
20°C (68°F)	3 days	5 days
30°C (86°F)	60 hours	4 days
40°C (104°F)	36 hours	3 days

### Notes:

- Minimum curing time of SIGMAGUARD 720 tank coating system before transport of cargoes with note 4, 7, 8 or 11: 3 months
- For detailed information on resistance and resistance notes, please refer to the latest issue of the Tank coating Resistance List (TRIS)
- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)

# SIGMAGUARD™ 720

## Curing time for DFT up to 125 µm (5.0 mils)

Substrate temperature	Dry to touch
5°C (41°F)	7 hours - 8 hours
10°C (50°F)	5 hours - 6 hours
20°C (68°F)	2 hours - 3 hours

## Pot life (at application viscosity)

Mixed product temperature	Pot life
15°C (59°F)	3 hours
20°C (68°F)	1.5 hours
25°C (77°F)	1 hour
30°C (86°F)	30 minutes

## 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

# SIGMAGUARD™ 720

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# PHENGUARD™ 935

## DESCRIPTION

Two-component, high-build, amine adduct-cured novolac phenolic epoxy coating

## PRINCIPAL CHARACTERISTICS

- Second coat in the PHENGUARD tank coating system
- Excellent resistance to a wide range of organic acids, alcohols, edible oils, fats (regardless of free fatty acid content) and solvents
- Maximum cargo flexibility
- Low cargo absorption
- Good resistance to hot water
- Recognized corrosion control coating (Lloyd's register)
- Good application properties, resulting in a smooth surface

## COLOR AND GLOSS LEVEL

- Pink
- Eggshell

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.7 kg/l (14.2 lb/US gal)
Volume solids	66 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 191.0 g/kg max. 315.0 g/l (approx. 2.6 lb/US gal)
Recommended dry film thickness	100 µm (4.0 mils)
Theoretical spreading rate	6.6 m <sup>2</sup> /l for 100 µm (265 ft <sup>2</sup> /US gal for 4.0 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 24 hours Maximum: 21 days
Full cure after	See curing table
Shelf life	Base: at least 12 months when stored cool and dry Hardener: at least 12 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

# PHENGUARD™ 935

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Previous coat (PHENGUARD 930) must be dry and free from any contamination
- The substrate must be perfectly dry before and during application of PHENGUARD 935

### Substrate temperature and application conditions

- Substrate temperature during application and curing should be above 10°C (50°F)
- Substrate temperature during application and curing should be at least 3°C (5°F) above dew point

## SYSTEM SPECIFICATION

- PHENGUARD 930 (offwhite): 100µm (4.0 mils)
- PHENGUARD 935 (pink): 100µm (4.0 mils)
- PHENGUARD 940 (gray): 100µm (4.0 mils)

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 88:12

- The temperature of the mixed base and hardener 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
- Thinner should be added after mixing the components

### Induction time

Allow induction time before use

Mixed product induction time	
Mixed product temperature	Induction time
15°C (59°F)	20 minutes
20°C (68°F)	15 minutes
25°C (77°F)	10 minutes

### Pot life

4 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life



# PHENGUARD™ 935

## Air spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

2.0 mm (approx. 0.079 in)

### **Nozzle pressure**

0.3 MPa (approx. 3 Bar; 44 p.s.i.)

---

## Airless spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

Approx. 0.46 – 0.53 mm (0.018 – 0.021 in)

### **Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

---

## Brush/roller

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 5%

---

## Cleaning solvent

THINNER 90-53

---



# PHENGUARD™ 935

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
100 µm (4.0 mils)	6.6 m <sup>2</sup> /l (265 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	5.3 m <sup>2</sup> /l (212 ft <sup>2</sup> /US gal)

Note: Maximum DFT when brushing: 60 µm (2.4 mils)

Overcoating interval for DFT up to 100 µm (4.0 mils)						
Overcoating with...	Interval	10°C (50°F)	15°C (59°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself and PHENGUARD 940	Minimum	36 hours	32 hours	24 hours	16 hours	12 hours
	Maximum	28 days	25 days	21 days	14 days	7 days

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 100 µm (4.0 mils)	
Substrate temperature	Minimum curing time before transport of cargoes without note 4, 7, 8 or 11 and ballast water or tank test with sea water
10°C (50°F)	14 days
15°C (59°F)	14 days
20°C (68°F)	10 days
30°C (86°F)	7 days
40°C (104°F)	5 days

### Notes:

- Minimum curing time of PHENGUARD tankcoating system before transport of cargoes with note 4, 7, 8 or 11: 3 months
- For detailed information on resistance and resistance notes, please refer to the latest issue of the cargo resistance list
- For transport of methanol and vinyl acetate monomer, a hot cure is required, which cannot be substituted by a service period of 3-months with non-aggressive cargoes
- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)
- The performance of the applied system strongly depends on the curing degree of the first coat at time of recoating. Therefore overcoating time between 1st and 2nd coat is extended in comparison between 2nd and 3rd coat (see overcoating details)

Pot life (at application viscosity)	
Mixed product temperature	Pot life
10°C (50°F)	6 hours
20°C (68°F)	4 hours
30°C (86°F)	1.5 hours



# PHENGUARD™ 935

## 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
- This product contains a substance that is the subject of a TSCA 5a Significant New Use Rule (SNUR) [to be published]

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.





# PHENGUARD™ 940

## DESCRIPTION

Two-component, high-build, amine adduct-cured novolac phenolic epoxy finish

## PRINCIPAL CHARACTERISTICS

- Finish coat in the PHENGUARD tank coating system
- Excellent resistance to a wide range of organic acids, alcohols, edible oils, fats (regardless of free fatty acid content) and solvents
- Maximum cargo flexibility
- Low cargo absorption
- Good resistance to hot water
- Recognized corrosion control coating (Lloyd's register)
- Good application properties, resulting in a smooth surface
- Easy to clean

## COLOR AND GLOSS LEVEL

- Light gray
- Eggshell

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.7 kg/l (14.2 lb/US gal)
Volume solids	66 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 191.0 g/kg max. 315.0 g/l (approx. 2.6 lb/US gal)
Recommended dry film thickness	100 µm (4.0 mils)
Theoretical spreading rate	6.6 m <sup>2</sup> /l for 100 µm (265 ft <sup>2</sup> /US gal for 4.0 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 24 hours Maximum: 21 days
Full cure after	See curing table
Shelf life	Base: at least 12 months when stored cool and dry Hardener: at least 12 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



# PHENGUARD™ 940

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Previous coat (PHENGUARD 935) must be dry and free from any contamination
- The substrate must be perfectly dry before and during application of PHENGUARD 940

### Substrate temperature and application conditions

- Substrate temperature during application and curing should be above 10°C (50°F)
- Substrate temperature during application and curing should be at least 3°C (5°F) above dew point

## SYSTEM SPECIFICATION

- PHENGUARD 930 (offwhite): 100µm (4.0 mils)
- PHENGUARD 935 (pink): 100µm (4.0 mils)
- PHENGUARD 940 (gray): 100µm (4.0 mils)

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 88:12

- The temperature of the mixed base and hardener 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
- Thinner should be added after mixing the components

### Induction time

Allow induction time before use

Mixed product induction time	
Mixed product temperature	Induction time
15°C (59°F)	20 minutes
20°C (68°F)	15 minutes
25°C (77°F)	10 minutes

### Pot life

4 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life



# PHENGUARD™ 940

## Air spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

2.0 mm (approx. 0.079 in)

### **Nozzle pressure**

0.3 MPa (approx. 3 Bar; 44 p.s.i.)

---

## Airless spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 10%, depending on required thickness and application conditions

### **Nozzle orifice**

Approx. 0.46 – 0.53 mm (0.018 – 0.021 in)

### **Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

---

## Brush/roller

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 5%

---

## Cleaning solvent

THINNER 90-53

---



# PHENGUARD™ 940

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
100 µm (4.0 mils)	6.6 m <sup>2</sup> /l (265 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	5.3 m <sup>2</sup> /l (212 ft <sup>2</sup> /US gal)

Note: Maximum DFT when brushing: 60 µm (2.4 mils)

Overcoating interval for DFT up to 100 µm (4.0 mils)						
Overcoating with...	Interval	10°C (50°F)	15°C (59°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself	Minimum	36 hours	32 hours	24 hours	16 hours	12 hours
	Maximum	28 days	25 days	21 days	14 days	7 days

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 100 µm (4.0 mils)	
Substrate temperature	Minimum curing time before transport of cargoes without note 4, 7, 8 or 11 and ballast water or tank test with sea water
10°C (50°F)	14 days
15°C (59°F)	14 days
20°C (68°F)	10 days
30°C (86°F)	7 days
40°C (104°F)	5 days

### Notes:

- Minimum curing time of PHENGUARD tankcoating system before transport of cargoes with note 4, 7, 8 or 11: 3 months
- For detailed information on resistance and resistance notes, please refer to the latest issue of the cargo resistance list
- For transport of methanol and vinyl acetate monomer, a hot cure is required, which cannot be substituted by a service period of 3-months with non-aggressive cargoes
- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)
- The performance of the applied system strongly depends on the curing degree of the first coat at time of recoating. Therefore overcoating time between 1st and 2nd coat is extended in comparison between 2nd and 3rd coat (see overcoating details)

Pot life (at application viscosity)	
Mixed product temperature	Pot life
10°C (50°F)	6 hours
20°C (68°F)	4 hours
30°C (86°F)	1.5 hours

# PHENGUARD™ 940

## 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
- This product contains a substance that is the subject of a TSCA 5a Significant New Use Rule (SNUR) [to be published]

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# SIGMASHIELD™ 1200

## DESCRIPTION

Two-component, abrasion-resistant, solvent-free, amine-cured phenolic epoxy coating

## PRINCIPAL CHARACTERISTICS

- Single coat system designed for under water hull of ice going and ice breaking vessels, with mechanical anti-fouling properties (easy to clean)
- Recognised by Lloyd's register as an abrasion resistant ice coating
- Excellent abrasion and impact resistance
- Highly durable deck system, which needs heavy impact and abrasion resistance such as cattle decks of livestock carriers and car decks of Ro-Ro vessels
- Low coefficient of friction
- Resistant to well designed cathodic protection
- Suitable for new construction and for maintenance/repair
- Also suitable for tanks and other structures requiring abrasion resistance
- Excellent resistance to crude oil up to 120°C (250°F)
- Good chemical resistance against a wide range of chemicals and solvents
- Can be applied by heavy-duty, single-feed, airless spray equipment (60:1)
- Reduced explosion risk and fire hazard
- Service life is expected more than 20 years when dried film is not seriously damaged

## COLOR AND GLOSS LEVEL

- Light Gray, dark gray, redbrown, black (other colors available 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	100%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 97.0 g/kg max. 143.0 g/l (approx. 1.2 lb/US gal) EPA Method 24: 100.0 g/ltr (0.8 lb/USgal)
Recommended dry film thickness	400 - 750 µm (16.0 - 30.0 mils)
Theoretical spreading rate	2.5 m <sup>2</sup> /l for 400 µm (100 ft <sup>2</sup> /US gal for 16.0 mils) 1.3 m <sup>2</sup> /l for 750 µm (53 ft <sup>2</sup> /US gal for 30.0 mils)
Dry to touch	6 hours
Overcoating Interval	Minimum: 24 hours Maximum: 2 months
Full cure after	5 days

# SIGMASHIELD™ 1200

## Data for mixed product

### 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

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Steel; blast cleaned to a minimum of ISO-Sa2½, blasting profile 50 – 100 µm (2.0 – 4.0 mils)
- Surface must be dry and free from any contamination

### Substrate temperature and application conditions

- Substrate temperature during application should be above 10°C (50°F)
- Substrate temperature during application and curing should be at least 3°C (5°F) above dew point

## SYSTEM SPECIFICATION

- The DFT of one layer should not exceed 1100 µm (44.0 mils) on overlap areas in order to avoid sagging
- For abrasion resistant ice coating for ships, 400-500 µm (16.0-20.0 mils) dft is recommended

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 80:20 (4:1)

- When mixing, the temperature of the base and hardener should be at least 20°C (68°F)
- No thinner should be added
- At lower temperature, the viscosity will be too high for spray application

### Induction time

None

### Pot life

1 hour at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life



# SIGMASHIELD™ 1200

## **Airless spray**

- Heavy-duty, single-feed airless spray equipment preferably 60:1 pump ratio and suitable high-pressure hoses
- Can be applied with plural component equipment
- Consult PPG Protective & Marine Coatings for further details

## **Recommended thinner**

No thinner should be added

## **Nozzle orifice**

Approx. 0.53 mm (0.021 in)

## **Nozzle pressure**

At 20°C (68°F) paint temperature min. 28.0 MPa (approx. 280 bar; 4061 p.s.i.). At 30°C (86°F) min. 22.0 MPa (approx. 220 bar; 3191 p.s.i.)

## **Brush/roller**

- For stripe coating and spot repair only

## **Recommended thinner**

No thinner should be added

## **Cleaning solvent**

THINNER 90-53 or THINNER 90-83

### Notes:

- All application equipment must be cleaned immediately after use
- Paint inside the spraying equipment must be removed before the pot life has been expired

## **ADDITIONAL DATA**

<b>Spreading rate and film thickness</b>	
<b>DFT</b>	<b>Theoretical spreading rate</b>
400 µm (16.0 mils)	2.5 m <sup>2</sup> /l (100 ft <sup>2</sup> /US gal)
500 µm (20.0 mils)	2.0 m <sup>2</sup> /l (80 ft <sup>2</sup> /US gal)
750 µm (30.0 mils)	1.3 m <sup>2</sup> /l (53 ft <sup>2</sup> /US gal)

Note: Maximum recommended dft for complex structures is 1100 µm (44.0 mils)



# SIGMASHIELD™ 1200

Overcoating interval for DFT up to 500 µm (20.0 mils)				
Overcoating with...	Interval	10°C (50°F)	20°C (68°F)	30°C (86°F)
itself, SIGMACOVER 555 and SIGMACOVER 456	Minimum	36 hours	24 hours	16 hours
	Maximum exposed to direct sunshine	22 days	14 days	7 days
	Maximum NOT exposed to direct sunshine	3 months	2 months	1 month
SIGMADUR 550	Minimum	36 hours	24 hours	16 hours
	Maximum exposed to direct sunshine	14 days	7 days	4 days
	Maximum NOT exposed to direct sunshine	3 months	2 months	1 month

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 500 µm (20 mils)		
Substrate temperature	Dry to handle	Full cure
10°C (50°F)	30 hours	7 days
20°C (68°F)	16 hours	5 days
30°C (86°F)	10 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
20°C (68°F)	1 hour
30°C (86°F)	45 minutes

Note: Due to exothermic reaction, temperature during and after mixing may increase

## SAFETY PRECAUTIONS

- For paint and recommended thinners see INFORMATION SHEETS 1430, 1431 and relevant Material Safety Data Sheets
- 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
- Ventilation should be provided in confined spaces to maintain good visibility

# SIGMASHIELD™ 1200

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# SIGMAPRIME® 700

## DESCRIPTION

Universal epoxy anticorrosive primer, based upon pure epoxy technology

## PRINCIPAL CHARACTERISTICS

- Universal pure epoxy primer system suitable for Ballast Tanks, Decks, Topside, Superstructure and Hull
- Good abrasion resistance for dedicated areas of application
- Good adhesion to steel and galvanized steel and non-ferrous metal
- Good flow and wetting properties
- Good water and corrosion resistance
- Cures at temperatures down to 5°C (41°F)
- Suitable for touching up of weld seams and damages of epoxy coatings during construction
- Excellent recoatability
- Can be overcoated with most alkyd-, chlorinated rubber-, vinyl-, epoxy- and two-component polyurethane coatings
- Compatible with well-designed cathodic protection systems
- Suitable on wet blast cleaned substrates (damp or dry)
- Suitable primer for SIGMAGLIDE fouling release system

## COLOR AND GLOSS LEVEL

- Gray, redbrown, yellow/green, green
- Eggshell

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.4 kg/l (11.7 lb/US gal)
Volume solids	70 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 227.0 g/kg max. 313.0 g/l (approx. 2.6 lb/US gal)
Recommended dry film thickness	100 - 250 µm (4.0 - 10.0 mils)
Theoretical spreading rate	7.0 m <sup>2</sup> /l for 100 µm (281 ft <sup>2</sup> /US gal for 4.0 mils) 3.5 m <sup>2</sup> /l for 200 µm (140 ft <sup>2</sup> /US gal for 8.0 mils)
Dry to touch	2 hours
Overcoating Interval	See overcoating tables
Full cure after	7 days

# SIGMAPRIME® 700

## Data for mixed product

### Shelf life

Base: at least 12 months when stored cool and dry  
Hardener: at least 24 months when stored cool and dry

### Notes:

- Mass Density (kg/l); Base 1,46 - 1,56 Hardener 0,96 - 0,99 Set 1,35 - 1,45
- See ADDITIONAL DATA - Spreading rate and film thickness
- See ADDITIONAL DATA - Overcoating intervals
- See ADDITIONAL DATA - Curing time

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Immersion exposure

- Steel or steel with not approved zinc silicate shop primer; blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Steel with approved zinc silicate shop primer; weld seams and areas of damaged shop primer or breakdown should be blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils) or power tool cleaned to SPSS-Pt3
- Coated steel; hydrojetted to VIS WJ2L (blasting profile 30 - 75 µm (1.2 - 3.0 mils))
- Previous coat must be dry and free from any contamination

### IMO-MSC.215(82) Requirements for Water Ballast Tanks and IMO-MSC.288(87) for Cargo tanks of Crude Oil Tankers (specified areas only)

- Steel; ISO 8501-3:2006 grade P2, with all edges treated to a rounded radius of minimum 2 mm (0.079 in) or subject to three pass grinding or at least equivalent process before painting
- Steel or steel with not approved zinc silicate shop primer; blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Steel with approved zinc silicate shop primer; weld seams and areas of shop primer damage or break down should be blast cleaned to Iso-Sa 2½ blasting profile 30 - 75 µm (1.2 - 3.0 mils): [1] For shop primer with IMO type approval; no additional requirements; [2] For shop primer without IMO type approval; blast cleaned to ISO-Sa2 removing at least 70% of intact shop primer, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Dust quantity on the surface to be coated must not exceed rating "1" for dust size class "3", "4" or "5" (ISO 8502-3-2017). Lower dust size classes ("1" and/or "2") to be removed if visible without magnification.
- Previous coat must be dry and free from any contamination

### Atmospheric exposure conditions

- Steel; blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils) or according to ISO-St3
- Shop primed steel; pretreated to SPSS-Pt3
- Existing pipelines may have to be cleaned first by scraper pigs and solvents
- Galvanized steel must be sweep blasted or otherwise roughened
- Galvanized steel must be free from grease, salts and any contamination
- Previous coat must be dry and free from any contamination



# SIGMAPRIME® 700

## **Substrate temperature and application conditions**

- Substrate temperature during application and curing should be at least 3°C (5°F) above dew point
  - Substrate temperature during application and curing should be above 5°C (41°F)
  - Relative humidity during application and curing should not exceed 85%
- 

## **INSTRUCTIONS FOR USE**

### **Mixing ratio by volume: base to hardener 80:20 (4:1)**

- The temperature of the mixed base and hardener 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
  - Thinner should be added after mixing the components
- 

### **Induction time**

None

---

### **Pot life**

8 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life

---

### **Air spray**

#### **Recommended thinner**

THINNER 91-92

#### **Volume of thinner**

0 - 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.)

---

# SIGMAPRIME® 700

## Airless spray

### **Recommended thinner**

THINNER 91-92

### **Volume of thinner**

0 - 15%, depending on required thickness and application conditions

### **Nozzle orifice**

Approx. 0.53 – 0.74 mm (0.021 – 0.029 in)

### **Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

---

## Brush/roller

### **Recommended thinner**

No extra thinner is necessary

### **Volume of thinner**

Up to 5% THINNER 91-92 can be added if desired

---

## Cleaning solvent

THINNER 90-53

---

## **ADDITIONAL DATA**

<b>Spreading rate and film thickness</b>	
<b>DFT</b>	<b>Theoretical spreading rate</b>
100 µm (4.0 mils)	7.0 m <sup>2</sup> /l (281 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	5.6 m <sup>2</sup> /l (225 ft <sup>2</sup> /US gal)
160 µm (6.3 mils)	4.4 m <sup>2</sup> /l (178 ft <sup>2</sup> /US gal)
200 µm (8.0 mils)	3.5 m <sup>2</sup> /l (140 ft <sup>2</sup> /US gal)

Note: Max. dft: Dry Film Thickness of 2000 µm (80.0 mils) may occur occasionally (minor areas) where multiple overlapping is unavoidable (i.e. around scallops, corners, erection joint lines etc.). PPG must be consulted in case of DFT readings fall outside this recommendation.

# SIGMAPRIME® 700

Overcoating interval for DFT up to 160 µm (6.3 mils)							
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	15°C (59°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
SIGMAGLIDE 790	Minimum	Not recommended	24 hours	16 hours	12 hours	8 hours	5 hours
	Maximum	Not recommended	6 days	4 days	3 days	3 days	48 hours

Note: At temperatures between 5°C (41°F) and 20°C (68°F) SIGMAPRIME 700 LT need to be specified. At temperatures above 20°C (68°F) SIGMAPRIME 700 is recommended

Overcoating interval for DFT up to 160 µm (6.3 mils)						
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
various two-pack epoxy coatings	Minimum	15 hours	9 hours	4 hours	2.5 hours	1.5 hours
	Maximum exposed to direct sunshine	3 months	3 months	2 months	2 months	2 months
	Maximum NOT exposed to direct sunshine	6 months	6 months	6 months	4 months	3 months

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 160 µm (6.3 mils)			
Substrate temperature	Dry to touch	Dry to handle	Full cure
5°C (41°F)	6 hours	18 hours	21 days
10°C (50°F)	4 hours	12 hours	14 days
15°C (59°F)	3 hours	9 hours	7 days
20°C (68°F)	2 hours	6 hours	5 days
30°C (86°F)	1 hour	3 hours	5 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
15°C (59°F)	10 hours
20°C (68°F)	8 hours
30°C (86°F)	4 hours

# SIGMAPRIME® 700

## 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
• PPG PROTECTIVE & MARINE COATINGS' BALLAST TANK WORKING PROCEDURES NEW-BUILDING		

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.



# SIGMAPRIME® 700

Depending on specific country of application the following versions are available:

Article code	Color	Reference
245824	grey	9515052150 (245344 base, 245346 hardener)
245825	redbrown	2008002150 (245345 base, 245346 hardener)
298560	yellow/green	4009002150 (298559 base, 245346 hardener)
267441	grey	5000002200 (267438 base, 267440 hardener)
267442	redbrown	2008002200 (267439 base, 267440 hardener)
269714	yellow/green	4009002200 (321758 base, 267440 hardener)
317126	redbrown	2008002200 (317121 base, 317124 hardener)
317127	grey	5000002200 (317122 base, 317124 hardener)
317128	yellow/green	4009002200 (317123 base, 317124 hardener)

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.

# SIGMACOVER™ 350

## DESCRIPTION

Two-component, high-build polyamide cured anticorrosive epoxy primer/coating

## PRINCIPAL CHARACTERISTICS

- Surface tolerant primer/coating for wide use in Marine and Protective Coatings
- Marine use: suitable on topsides, decks, superstructures and cargo holds
- Excellent corrosion resistance
- Compatible with various aged coatings
- Suitable as floor coating for pedestrian traffic with dry to walk on time of 6 hours at 20°C (68°F)
- Good impact and abrasion resistance
- Smooth film, easy to clean
- Resistant to splash and spillage of a wide range of chemicals

## COLOR AND GLOSS LEVEL

- Standard and custom colors, including aluminum
- For Cargo holds gray ( 5177 ) and redbrown ( 6179 ) only
- Semi-gloss

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.4 kg/l (11.7 lb/US gal)
Volume solids	72 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 263.0 g/kg max. 361.0 g/l (approx. 3.0 lb/US gal)
Recommended dry film thickness	100 - 150 µm (4.0 - 6.0 mils) for airless spray
Theoretical spreading rate	5.8 m <sup>2</sup> /l for 125 µm (231 ft <sup>2</sup> /US gal for 5.0 mils) 4.8 m <sup>2</sup> /l for 150 µm (192 ft <sup>2</sup> /US gal for 6.0 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 6 hours Maximum: 21 days
Full cure after	7 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



# SIGMACOVER™ 350

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Steel; blast cleaned to ISO-Sa2½ for excellent corrosion protection, blasting profile 40 – 70 µm (1.6 – 2.8 mils)
- Steel; blast cleaned to ISO-Sa2, blasting profile 40 – 70 µm (1.6 – 2.8 mils) or power tool cleaned to minimum ISO-St2 for good corrosion protection
- Coated steel; hydrojetted to VIS WJ2/3L
- Surface must be dry and free from any contamination
- Existing sound epoxy systems and most sound alkyd coating system; sufficiently roughened

---

### Substrate conditions of concrete for thinned version

- Dried for at least 28 days in good ventilation conditions
- Moisture content should not exceed 4.5%
- Concrete must be sound, dry, free from laitance and any contamination
- Rough surface; eventually abraded by power tool or diamond abrading tool

---

### Coated concrete

- Existing sound coating systems; sufficiently roughened, dry and cleaned
- To ensure compatibility, rub the existing coating with a cloth with Xylene or MEK for 10 seconds, and remove existing coatings if dissolving occurs
- Rough surface; eventually abraded by power tool or diamond abrading tool

---

### 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

- SIGMACOVER 350: 2 x 125 µm (5.0 mils) DFT

---

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 80:20 (4:1)

- The temperature of the mixed base and hardener 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
- Thinner should be added after mixing the components

---

### Induction time

None



# SIGMACOVER™ 350

**Pot life**

3 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life

---

**Air spray****Recommended thinner**

THINNER 91-92

**Volume of thinner**

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

**Nozzle orifice**

1.8 - 2.0 mm (approx. 0.070 - 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. 0.48 - 0.53 mm (0.019 - 0.021 in)

**Nozzle pressure**

15.0 MPa (approx. 150 bar; 2176 p.s.i.)

---

**Brush/roller****Recommended thinner**

THINNER 91-92

**Volume of thinner**

0 - 5%

Note: 10 - 15% when applied as a primer direct to concrete

---

**Cleaning solvent**

THINNER 90-53

---

# SIGMACOVER™ 350

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
100 µm (4.0 mils)	7.2 m <sup>2</sup> /l (289 ft <sup>2</sup> /US gal)
125 µm (5.0 mils)	5.8 m <sup>2</sup> /l (231 ft <sup>2</sup> /US gal)
150 µm (6.0 mils)	4.8 m <sup>2</sup> /l (192 ft <sup>2</sup> /US gal)

Note: Maximum DFT when brushing: 100 µm (4.0 mils)

Overcoating interval for DFT up to 150 µm (6.0 mils)						
For application in Marine cargo holds and areas exposed to water immersion						
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	16 hours	9 hours	6 hours	4 hours	3 hours
	Maximum	1 month	1 month	21 days	14 days	7 days

Overcoating interval for DFT up to 150 µm (6.0 mils)						
For application in Marine areas subject to non-permanent exposure to splash water, seawater, spillage to chemicals etc.						
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself and various two-pack epoxy coatings	Minimum	16 hours	9 hours	6 hours	4 hours	3 hours
	Maximum	1 month	1 month	21 days	14 days	7 days
polyurethanes	Minimum	48 hours	30 hours	18 hours	9 hours	5 hours
	Maximum	1 month	21 days	14 days	7 days	3 days

Overcoating interval for DFT up to 150 µm (6.0 mils)						
For application in atmospheric exposure and industrial PC						
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself and various two-pack epoxy coatings	Minimum	16 hours	9 hours	6 hours	4 hours	3 hours
	Maximum	6 months	5 months	3 months	2 months	21 days
polyurethanes	Minimum	48 hours	48 hours	18 hours	9 hours	5 hours
	Maximum	6 months	5 months	2.5 months	1.5 months	14 days
various single pack coatings (such as alkyds and acrylics)	Minimum	24 hours	24 hours	16 hours	8 hours	5 hours
	Maximum	14 days	14 days	14 days	7 days	4 days

Note: In cases of exposure to direct sunlight or when the surface is contaminated it is recommended that the surface be cleaned and roughened to ensure good adhesion of the subsequent coating.

# SIGMACOVER™ 350

## Curing time for DFT up to 150 µm (6.0 mils)

Substrate temperature	Dry to touch	Dry to handle	Full cure
5°C (41°F)	12 hours	16 hours	25 days
10°C (50°F)	6 hours	9 hours	15 days
20°C (68°F)	2 hours	6 hours	7 days
30°C (86°F)	1 hour	4 hours	4 days
40°C (104°F)	1 hour	3 hours	48 hours

### Notes:

- For cargo hold application: for full cure for hard angular cargoes, please contact your nearest PPG Protective & Marine Coatings sales office
- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)
- Should SIGMACOVER 350 or the total coating system (2 x 125 µm/2 x 5.0 mils) be applied in excess of the specified dry film thickness, then the time necessary to reach full cure will be increased

## Pot life (at application viscosity)

Mixed product temperature	Pot life
15°C (59°F)	4 hours
20°C (68°F)	3 hours
30°C (86°F)	2 hours
40°C (104°F)	1 hour

## 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

• 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



# SIGMACOVER™ 350

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# SIGMACOVER™ 380

## DESCRIPTION

Universal epoxy anticorrosive primer, based upon pure epoxy technology

## PRINCIPAL CHARACTERISTICS

- Universal pure epoxy primer system suitable for Ballast Tanks, Decks, Topside, Superstructure and Hull
- Good abrasion resistance for dedicated areas of application
- Suitable for immersion service (ballast tanks, outside shell)
- Good anticorrosive properties and water resistance
- Good flexibility
- Resistant to well designed cathodic protection
- Good drying and curing property
- Suitable for both newbuilding and maintenance applications

## COLOR AND GLOSS LEVEL

- grey, green, yellow green, light grey
- Eggshell

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Mass density	1.4 kg/l (11.7 lb/US gal)
Volume solids	80 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 161.0 g/kg max. 226.0 g/l (approx. 1.9 lb/US gal)
Recommended dry film thickness	125 - 200 µm (5.0 - 8.0 mils) depending on system
Theoretical spreading rate	6.4 m <sup>2</sup> /l for 125 µm (257 ft <sup>2</sup> /US gal for 5.0 mils)
Dry to touch	3 hours
Overcoating Interval	Minimum: 8 hours Maximum: 28 days
Full cure after	7 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



# SIGMACOVER™ 380

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Immersion exposure

- Steel or steel with not approved zinc silicate shop primer: blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Steel with approved zinc silicate shop primer; weld seams and areas of damaged shop primer or breakdown should be blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils) or power tool cleaned to SPSS-Pt3
- Coated steel; hydrojetted to VIS WJ2L (blasting profile 30 - 75 µm (1.2 - 3.0 mils))
- Previous coat must be dry and free from any contamination

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

- Steel; ISO 8501-3: 2006 grade P2, with all edges treated to a rounded radius of minimum 2 mm (0.0789 in) or subject to three pass grinding
- Steel or steel with not approved zinc silicate shop primer: blast cleaned to ISO-Sa2½, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Steel with approved zinc silicate shop primer; weld seams and areas of shop primer damage or break down should be blast cleaned to Iso-Sa 2½ blasting profile 30 - 75 µm (1.2 - 3.0 mils): [1] For shop primer with IMO type approval; no additional requirements; [2] For shop primer without IMO type approval; blast cleaned to ISO-Sa2 removing at least 70% of intact shop primer, blasting profile 30 - 75 µm (1.2 - 3.0 mils)
- Damages up to 2% of the total area of the tank may be treated to ISO-St3. Damages over 2% of the total area of the tank or contiguous damages over 25 m<sup>2</sup> (269 ft<sup>2</sup>) have to be blast cleaned to ISO-Sa2½.
- 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)
- Previous coat must be dry and free from any contamination

### Atmospheric exposure conditions

- Steel; pretreated preferably to ISO-Sa2½, , blasting profile 30 - 75 µm (1.2 - 3.0 mils) or according to ISO-St3
- Shop primed steel; pretreated to SPSS-Pt3
- Galvanized steel must be free from grease, salts and any contamination
- Galvanized steel must be sweep blasted or otherwise roughened
- Coated steel; hydrojetted to VIS WJ2L (blasting profile 30 - 75 µm (1.2 - 3.0 mils))
- Previous coat must be dry and free from any contamination

### 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
- Relative humidity during application and curing should not exceed 85%

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 80:20 (4:1)

- The temperature of the mixed base and hardener 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
- Thinner should be added after mixing the components



# SIGMACOVER™ 380

**Induction time**

None

**Pot life**

4 hours at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life

**Airless spray****Recommended thinner**

THINNER 91-92

**Volume of thinner**

0 - 10%, depending on required thickness and application conditions

**Nozzle orifice**

Approx. 0.46 – 0.53 mm (0.018 – 0.021 in)

**Nozzle pressure**

20.0 - 25.0 MPa (approx. 200 - 250 bar; 2901 - 3626 p.s.i.)

**Brush/roller**

- Brush: for stripe coating and spot repair only

**Cleaning solvent**

THINNER 90-53

**ADDITIONAL DATA**

Spreading rate and film thickness	
DFT	Theoretical spreading rate
125 µm (5.0 mils)	6.4 m <sup>2</sup> /l (257 ft <sup>2</sup> /US gal)
160 µm (6.3 mils)	5.0 m <sup>2</sup> /l (204 ft <sup>2</sup> /US gal)
200 µm (8.0 mils)	4.0 m <sup>2</sup> /l (160 ft <sup>2</sup> /US gal)

Note: Maximum DFT in critical areas, applied in two equal coats: 1500 µm (60.0 mils)

# SIGMACOVER™ 380

Overcoating interval for DFT up to 160 µm (6.3 mils)						
DONOTPRINTONPDF						
Overcoating with...	Interval	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself and various two-pack epoxy coatings	Minimum	48 hours	24 hours	8 hours	4 hours	2 hours
	Maximum	28 days	28 days	28 days	28 days	21 days
urethane coatings and alkyds	Minimum	48 hours	28 hours	12 hours	6 hours	3 hours
	Maximum	14 days	14 days	14 days	14 days	7 days

Note: Surface should be dry and free from any contamination

Curing time for DFT up to 160 µm (6.3 mils)			
Substrate temperature	Dry to touch	Dry to handle	Full cure
5°C (41°F)	24 hours	48 hours	20 days
10°C (50°F)	12 hours	24 hours	14 days
20°C (68°F)	3 hours	8 hours	7 days
30°C (86°F)	2 hours	6 hours	4 days
40°C (104°F)	1 hour	4 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
15°C (59°F)	6 hours
20°C (68°F)	4 hours
30°C (86°F)	2 hours
40°C (104°F)	1 hour

## 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.



# SIGMACOVER™ 380

## REFERENCES

• 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
• PPG PROTECTIVE & MARINE COATINGS' BALLAST TANK WORKING PROCEDURES NEW-BUILDING		

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

Article code	Color	Reference
250041	green	4100002200 (00250040 base, 00250044 hardener)
250043	grey	5100002200 (00250042 base, 00250044 hardener)
330731	yellow/green	4200002200 (00330709 base, 00250044 hardener)
383417	grey	5000002200 (00383416 base, 00250044 hardener)
388013	light grey	5177052200 (00388012 base, 00250044 hardener)

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# SIGMA SAILADVANCE RX

## DESCRIPTION

Low friction, self lubricating, linear self polishing antifouling based on hydrolysable binder composition

## PRINCIPAL CHARACTERISTICS

- Designed for all vessel types and speeds and particularly effective for slow steaming because of its engineered oils binder composition
- Evolves in a linear polishing and consistent biocide release for predictable performance up to 90 months
- Most suitable for mid to high operational ranges
- Constant surface activity, limited leach layer build-up
- Low friction properties from lubricating engineered oils suppressing turbulent flow
- Extended idle days through the release effect of engineered oils creating a slippery surface
- High volume solids for efficient application
- Suitable for application at New Build and Dry Dockings
- Based on PPG technology

## COLOR AND GLOSS LEVEL

- Redbrown, brown, black
- Flat

## BASIC DATA AT 20°C (68°F)

Data for product	
Number of components	One
Mass density	1.7 kg/l (14.2 lb/US gal)
Volume solids	54 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 252.0 g/kg max. 425.0 g/l (approx. 3.5 lb/US gal)
Recommended dry film thickness	75 - 165 µm (3.0 - 6.5 mils) depending on system
Theoretical spreading rate	3.6 m <sup>2</sup> /l for 150 µm (144 ft <sup>2</sup> /US gal for 6.0 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 6 hours
Refloating time	Minimum: 12 hours
Shelf life	At least 12 months when stored cool and dry

### Notes:

- See ADDITIONAL DATA - Spreading rate and film thickness
- See ADDITIONAL DATA - Overcoating intervals



# SIGMA SAILADVANCE RX

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Previous coat must be sound, dry and free from any contamination
  - Suitable high performance anticorrosive tiecoats
- 

### Substrate temperature and application conditions

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

## INSTRUCTIONS FOR USE

- Stir well before use
  - 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
- 

### Airless spray

#### **Recommended thinner**

THINNER 21-06

#### **Volume of thinner**

0 - 3%, depending on required thickness and application conditions

#### **Nozzle orifice**

Approx. 0.53 - 0.69 mm (0.021 - 0.027 in)

#### **Nozzle pressure**

12.0 - 15.0 MPa (approx. 120 - 150 bar; 1741 - 2176 p.s.i.)

---

### Brush/roller

- Only for touch-up and spot repair

#### **Recommended thinner**

THINNER 21-06

#### **Volume of thinner**

0 - 3%

---

### Cleaning solvent

THINNER 21-06

---

# SIGMA SAILADVANCE RX

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
75 µm (3.0 mils)	7.2 m <sup>2</sup> /l (289 ft <sup>2</sup> /US gal)
100 µm (4.0 mils)	5.4 m <sup>2</sup> /l (217 ft <sup>2</sup> /US gal)
150 µm (6.0 mils)	3.6 m <sup>2</sup> /l (144 ft <sup>2</sup> /US gal)
165 µm (6.5 mils)	3.3 m <sup>2</sup> /l (133 ft <sup>2</sup> /US gal)

Overcoating interval for DFT up to 165 µm (6.5 mils)							
Overcoating with...	Interval	-5°C (23°F)	0°C (32°F)	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)
itself	Minimum	24 hours	18 hours	12 hours	10 hours	6 hours	4 hours
	Refloating - Minimum	36 hours	30 hours	24 hours	18 hours	12 hours	9 hours

Notes:

- Longer drying times may be necessary at higher DFT and under unfavorable atmospheric conditions
- Above table is a fair indication for normal application conditions. Please contact your PPG representative for data at much lower and higher DFT conditions

## 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

- |  |                   |      |
|--|-------------------|------|
| • 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 |

## 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.



# SIGMA SAILADVANCE RX

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

Depending on specific country of application the following versions are available:

Article code	Color	Reference
371223	redbrown	2008002200
371224	brown	2000002200

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.





# SIGMA SAILADVANCE™ GX

## DESCRIPTION

Low friction, self lubricating, linear self polishing high activity performance antifouling based on hydrolysable binder composition

## PRINCIPAL CHARACTERISTICS

- Designed for all vessel types and speeds and particularly effective for slow steaming because of its engineered oils binder composition
- Evolves in a linear polishing and consistent biocide release for predictable performance up to 90 months
- Designed for broad range of vessel operational profiles
- Constant surface activity, limited leach layer build-up
- Low friction properties from lubricating engineered oils suppressing turbulent flow
- Extended idle days through the release effect of engineered oils creating a slippery surface
- High volume solids for efficient application
- Suitable for application at New Build and Dry Dockings
- Based on PPG technology

## COLOR AND GLOSS LEVEL

- Redbrown, brown
- Flat

## BASIC DATA AT 20°C (68°F)

Data for product	
Number of components	One
Mass density	1.7 kg/l (14.2 lb/US gal)
Volume solids	59 ± 2%
VOC (Supplied)	Directive 1999/13/EC, SED: max. 227.0 g/kg max. 398.0 g/l (approx. 3.3 lb/US gal)
Recommended dry film thickness	75 - 165 µm (3.0 - 6.5 mils) depending on system
Theoretical spreading rate	3.6 m <sup>2</sup> /l for 165 µm (146 ft <sup>2</sup> /US gal for 6.5 mils)
Dry to touch	2 hours
Overcoating Interval	Minimum: 6 hours
Refloating time	Minimum: 12 hours
Shelf life	At least 12 months when stored cool and dry

### Notes:

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



# SIGMA SAILADVANCE™ GX

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Previous coat must be sound, dry and free from any contamination
  - Suitable high performance anticorrosive tiecoats
- 

### Substrate temperature and application conditions

- Substrate temperature during application should be at least 3°C (5°F) above dew point
  - Relative humidity during application and curing should not exceed 85%
- 

## INSTRUCTIONS FOR USE

- Stir well before use
  - 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
- 

### Airless spray

#### **Recommended thinner**

THINNER 21-06

#### **Volume of thinner**

0 - 3%, depending on required thickness and application conditions

#### **Nozzle orifice**

Approx. 0.53 - 0.69 mm (0.021 - 0.027 in)

#### **Nozzle pressure**

12.0 - 15.0 MPa (approx. 120 - 150 bar; 1741 - 2176 p.s.i.)

---

### Brush/roller

- Only for touch-up and spot repair

#### **Recommended thinner**

THINNER 21-06

#### **Volume of thinner**

0 - 3%

---

### Cleaning solvent

THINNER 21-06

---



# SIGMA SAILADVANCE™ GX

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
75 µm (3.0 mils)	7.9 m <sup>2</sup> /l (315 ft <sup>2</sup> /US gal)
100 µm (4.0 mils)	5.9 m <sup>2</sup> /l (237 ft <sup>2</sup> /US gal)
150 µm (6.0 mils)	3.9 m <sup>2</sup> /l (158 ft <sup>2</sup> /US gal)
165 µm (6.5 mils)	3.6 m <sup>2</sup> /l (146 ft <sup>2</sup> /US gal)

Overcoating interval for DFT up to 165 µm (6.5 mils)							
Overcoating with...	Interval	-5°C (23°F)	0°C (32°F)	5°C (41°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)
itself	Minimum	24 hours	18 hours	12 hours	10 hours	6 hours	4 hours
	Refloating - Minimum	36 hours	30 hours	24 hours	16 hours	12 hours	9 hours

### Notes:

- Longer drying times may be necessary at higher DFT and under unfavorable atmospheric conditions
- Above table is a fair indication for normal application conditions. Please contact your PPG representative for data at much lower and higher DFT conditions

## 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

- |  |                   |      |
|--|-------------------|------|
| • 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 |

## 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.

# SIGMA SAILADVANCE™ GX

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

Depending on specific country of application the following versions are available:

Article code	Color	Reference
371293	redbrown	2008002200
371294	brown	2000002200

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.



# NOVAGUARD™ 810 ER

## DESCRIPTION

Two-component, solvent-free, amine rapid-cured novolac phenolic epoxy coating

## PRINCIPAL CHARACTERISTICS

- Rapid cure and return-to-service
- Cures at temperatures down to -7°C (20°F)
- Good chemical resistance against a wide range of chemicals and solvents
- Smooth finish and light color for easy cleaning and inspection
- Hydrocarbon immersion after only 1 day at 20°C (68°F)
- Qualification for MIL-PRF-23236D Type VII: Class 5/18, 7/18, 17/18, 19/18
- Meets NSF/ANSI Standard 61 for potable water when applied and used as described on <http://info.nsf.org/>

## COLOR AND GLOSS LEVEL

- Cream OAP (Off-white base + Yellow cure), Green OAP (Green base + Neutral cure), Red Oxide OAP (Red oxide base + Neutral cure), Off-white OAP (Off-white base + Neutral cure)
- Semi-gloss

## BASIC DATA AT 20°C (68°F)

Data for mixed product	
Number of components	Two
Volume solids	100%
VOC (Supplied)	EPA Method 24: 61.0 g/ltr (0.5 lb/USgal)
Recommended dry film thickness	20.0 - 40.0 mils (500 - 1000 µm) depending on system
Theoretical spreading rate	80 ft <sup>2</sup> /US gal for 20.0 mils (2.0 m <sup>2</sup> /l for 500 µm)
Dry to touch	2 hours
Overcoating Interval	Minimum: 6 hours Maximum: 28 days
Full cure after	48 hours
Shelf life	Base: at least 24 months when stored cool and dry Hardener: at least 24 months when stored cool and dry

### Notes:

- Volume solids based on oven solids testing is 93%
- See ADDITIONAL DATA - Spreading rate and film thickness
- See ADDITIONAL DATA - Overcoating intervals
- See ADDITIONAL DATA - Curing time



# NOVAGUARD™ 810 ER

## RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

### Substrate conditions

- Steel; blast cleaned to a minimum of SSPC-SP10 or ISO-SA2½, blasting profile 50 – 125 µm (5.0 mils) (2.0 – 5.0 mils)
- 

### Substrate temperature and application conditions

- Substrate temperature during application and curing down to -7°C (20°F) is acceptable; provided the substrate is free from ice and dry
  - Substrate temperature during application and curing should be at least 3°C (5°F) above dew point
- 

## INSTRUCTIONS FOR USE

### Mixing ratio by volume: base to hardener 80:20 (4:1)

- The temperature of the mixed base and hardener should preferably be above 75°F (24°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

---

### Airless spray

- Use heated, airless spray, plural-component equipment
- In-line heating or insulated hoses may be necessary to avoid cooling down of paint in hoses at low air temperature
- Length of hoses should be as short as possible

### Recommended thinner

No thinner should be added

### Nozzle orifice

Approx. 0.48 – 0.53 mm (0.019 – 0.021 in)

### Nozzle pressure

3500 - 4250 p.s.i. (approx. 242 - 293 bar; 24.1 - 29.3 MPa)

### Notes:

- For optimal flow and leveling on horizontal areas having a substrate temperature below 20°C (68°F), the paint temperature (spray fan) should be kept typically below 30°C (86°F). The distance between the spray gun and the substrate should be low, for example less than 50 cm (20 inch)
  - For optimal flow and sag resistance on vertical areas having a substrate temperature above 20°C (68°F), the paint temperature (spray fan) should be kept typically above 30°C (86°F)
-

# NOVAGUARD™ 810 ER

## Cleaning solvent

THINNER 90-53 or THINNER 90-83

Note: All application equipment must be cleaned immediately after use. Paint inside the spraying equipment must be removed before the pot life has been expired.

## ADDITIONAL DATA

Spreading rate and film thickness	
DFT	Theoretical spreading rate
20.0 mils (500 µm)	80 ft <sup>2</sup> /US gal (2.0 m <sup>2</sup> /l)
30.0 mils (750 µm)	53 ft <sup>2</sup> /US gal (1.3 m <sup>2</sup> /l)

## Measuring wet film thickness

- A difference 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
- Polymer shrinkage will also affect the final dry film thickness reading. A practical volume solids of 93% is therefore used for estimation of spreading rate

## Measuring dry film thickness

- The DFT should be measured using a calibration foil of known thickness placed in between the coating and the measuring device

Overcoating interval for DFT up to 1000 µm (40.0 mils)							
Overcoating with...	Interval	-5°C (23°F)	0°C (32°F)	10°C (50°F)	20°C (68°F)	30°C (86°F)	40°C (104°F)
itself	Minimum	48 hours	24 hours	12 hours	6 hours	4 hours	3 hours
	Maximum	28 days	28 days	28 days	22.5 days	14 days	7 days

Note: Surface should be dry and free from any contamination and ice

# NOVAGUARD™ 810 ER

Curing time for DFT up to 1000 µm (40.0 mils)		
Substrate temperature	Dry to handle	Full cure
40°F (4°C)	18 hours	5 days
50°F (10°C)	12 hours	3 days
68°F (20°C)	6 hours	48 hours
86°F (30°C)	4.5 hours	30 hours
104°F (40°C)	less than 3 hours	24 hours

#### Notes:

- Adequate ventilation must be maintained during application and curing (please refer to INFORMATION SHEETS 1433 and 1434)
- For storage and transport of drinking water the recommended working procedure should be followed
- Holiday test can be done after dry to handle time

Pot life (at application viscosity)	
Mixed product temperature	Pot life
77°F (25°C)	15 minutes
110°F (43°C)	7 minutes

Note: It is recommended to use plural airless equipment due to the short pot life

#### Product Qualifications

- Compliant with EI 1541, Performance requirements for protective coating systems used in aviation fuel storage tanks and piping

#### SAFETY PRECAUTIONS

- For paint and recommended thinners see INFORMATION SHEETS 1430, 1431 and relevant Material Safety Data Sheets
- 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
- 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

#### 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.





# NOVAGUARD™ 810 ER

## 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](http://www.ppgpmc.com). The English text of this sheet shall prevail over any translation thereof.

The PPG logo, and all other PPG marks are property of the PPG group of companies. All other third-party marks are property of their respective owners.

