

# SIGMALINE™ 2000

## DESCRIPTION

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

## PRINCIPAL CHARACTERISTICS

- One-coat system direct to metal for pipe externals
- Suitable for e.g. bell holing jobs
- Resistant to well designed cathodic protection
- Glossy and smooth appearance
- Can be applied by heavy-duty, twin-feed, hot, airless spray equipment
- Can be applied at a substrate temperature of 90°C (194°F)
- Reduced explosion risk and fire hazard
- Approved to Saudi Aramco APCS 113A
- Meets the requirements of EN10289

## COLOR AND GLOSS LEVEL

- Redbrown
- 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                  | 100%   |
| VOC (Supplied)                 | Directive 1999/13/EC, SED: max. 108.0 g/kg<br>max. 146.0 g/l (approx. 1.2 lb/US gal)                       |
| Recommended dry film thickness | 600 - 1500 µm (24.0 - 60.0 mils) depending on system   |
| Theoretical spreading rate     | 1.7 m <sup>2</sup> /l for 600 µm (67 ft <sup>2</sup> /US gal for 24.0 mils)                                |
| Dry to touch                   | 6 hours  |
| Overcoating Interval           | Minimum: 24 hours<br>Maximum: 2 months   |
| Full cure after                | 5 days   |
| Shelf life                     | Base: at least 24 months when stored cool and dry<br>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

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## 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)
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### Substrate temperature

- 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
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## 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)
  - At lower temperature, the viscosity will be too high for spray application
  - No thinner should be added
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### Induction time

None

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### Pot life

1 hour at 20°C (68°F)

Note: See ADDITIONAL DATA – Pot life

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### Airless spray

#### **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.)

#### Notes:

- Use heavy-duty, single-feed, airless spray equipment, preferably 60:1 pump ratio and suitable high-pressure hoses
  - In-line heating or insulated hoses may be necessary to avoid cooling down of paint in hoses at low air temperature
  - Length of hoses should be as short as possible
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## 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

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                         |
| 600 µm (24.0 mils)                | 1.7 m <sup>2</sup> /l (67 ft <sup>2</sup> /US gal) |
| 1000 µm (40.0 mils)               | 1.0 m <sup>2</sup> /l (40 ft <sup>2</sup> /US gal) |
| 1500 µm (60.0 mils)               | 0.7 m <sup>2</sup> /l (27 ft <sup>2</sup> /US gal) |

Note: Maximum DFT when brushing: 150 µm (6.0 mils)

## Measuring wet film thickness

- A deviation is often obtained between the measured apparent WFT and the real applied WFT
- 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
- Recommendation is to apply a WFT, which is equal to the specified DFT plus 60 µm (2.4 mils)

## Maximum dry film thickness

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

| Overcoating interval for DFT up to 600 µm (24.0 mils) |          |            |             |             |             |
|---|----------|------------|-------------|-------------|-------------|
| Overcoating with...                                   | Interval | 5°C (41°F) | 10°C (50°F) | 20°C (68°F) | 30°C (86°F) |
| itself for repair only                                | Minimum  | 3.5 days   | 36 hours    | 24 hours    | 12 hours    |
|   | Maximum  | 3 months   | 3 months    | 2 months    | 1 month     |

Note: Surface should be dry and free from any contamination



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**Curing time for DFT up to 600 µm (24.0 mils)**

| Substrate temperature | Dry to handle | Full cure |
|-----------------------|---------------|-----------|
| 5°C (41°F)            | 60 hours      | 15 days   |
| 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 |
| 40°C (104°F)              | 20 minutes |

## Notes:

- Due to exothermic reaction, temperature during and after mixing may increase
- It is recommended to use plural airless equipment due to the short pot life when paint temperature is above 40°C (104°F)

**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

**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.



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## 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 |
| • SURFACE PREPARATION OF STEEL PIPES AND FITTINGS SHOP APPLICATION             | INFORMATION SHEET | 1492 |
| • INTERNAL CHEMICAL CLEANING OF STEEL PIPES IN-SITU APPLICATION                | INFORMATION SHEET | 1493 |
| • RELATIVE HUMIDITY – SUBSTRATE TEMPERATURE – AIR TEMPERATURE                  | INFORMATION SHEET | 1650 |

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