PPG HI-TEMP™ 1027

DESCRIPTION

One-component, high-build heat-resistant inert multipolymeric matrix / inorganic ceramic coating

PRINCIPAL CHARACTERISTICS

- Designed to prevent corrosion under insulation (CUI) of carbon steel and stainless steel
- Prevent external stress corrosion cracking (ESCC) of austenitic and duplex stainless steel
- Resistant to thermal shock / cycling and intermittent immersion and boiling water
- Continuous temperature resistance to 650°C (1200°F) and intermittent temperature resistance to 760°C (1400°F)
- Cyclic temperature resistance from -196°C (-320°F) to 540°C (1000°F)
- Surface tolerant and stable against UV
- May be used as primer for PPG HI-TEMP heat-resistant color topcoats
- Complies with NACE SP0198 for austenitic stainless steels and carbon steels under thermal insulation

COLOR AND GLOSS LEVEL

- Black, gray and light gray
- Flat

Notes:

- Minor color differences may occur due to batch variation and from exposed service, but corrosion protection will not be compromised
- For best results, use black or gray color as first coat

BASIC DATA AT 20°C (68°F)

Data for product	
Number of components	One
Mass density	1.9 kg/l (16.0 lb/US gal)
Volume solids	72 ± 2%
VOC (Supplied)	Directive 2010/75/EU, SED: max. 210.0 g/kg max. 420.0 g/l (approx. 3.5 lb/US gal) EPA Method 24: 390.0 g/ltr (3.3 lb/USgal)
Recommended dry film thickness	125 - 250 µm (5.0 - 10.0 mils) depending on requirements
Theoretical spreading rate	5.8 m^2/l for 125 µm (231 ft^2/US gal for 5.0 mils) 2.9 m^2/l for 250 µm (115 ft^2/US gal for 10.0 mils)
Dry to handle	24 hours
Overcoating Interval	Minimum: 6 hours
Shelf life	At least 24 months when stored cool and dry

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Notes:

- VOC data by EPA Method 24: consider DMC (DiMethyl Carbonate) as exempt
- 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 of carbon steel for insulated and non-insulated service

- Must be free of oil, dirt, grease and all other contaminants, especially salts
- Round off all rough welds and sharp edges. Remove weld spatter
- Recommended is dry abrasive blast cleaning to SSPC-SP6, “Commercial Blast” (ISO-Sa2) with a 25 to 50 µm (1.0 to 2.0 mils) profile
- Alternative methods to abrasive blast cleaning include : ISO-St2 (SSPC-SP-2), ISO-St3 (SSPC-SP-3), SSPC-SP-15 or SSPC-SP WJ-2 or WJ-3 with dry surface
- For application in cryogenic service and for application over inorganic zinc (IOZ), refer to the PPG HI-TEMP 1027 Application Guide
- For service not exceeding 150°C (300°F) please contact PPG representative

Substrate conditions of stainless steel for insulated and non-insulated service

- Suitable austenitic stainless grades for PPG HI-TEMP 1027 are 304, 316 and 410. For other stainless steel grades, please contact PPG Technical Support
- Must be free of oil, dirt, grease and all other contaminants, especially salts
- Round off all rough welds and sharp edges. Remove weld spatter
- Lightly abrasive blast in accordance with SSPC-SP 16 requirements or otherwise abrade the surface to ensure a uniform and dense surface profile of at least 25 µm (1.0 mil)
- Temperature not to exceed 540°C (1000°F) under cyclic conditions

Substrate temperature and application conditions

- Substrate temperature during application should be between 10°C (50°F) and 66°C (151°F)
- Substrate temperature during application should be at least 3°C (5°F) above dew point
- Relative humidity during application should not exceed 85%, and good ventilation is required
- Application to hot substrate: should be above 66°C (151°F) and below 316°C (600°F)

Notes:

- For application to substrates over 200°C (392°F) to 316°C (600°F) a PPG representative needs to be consulted
- If the air temperature is expected to fall below 10°C (50°F) during drying, the dry time must be extended

Initial high temperature exposure when topcoated

- When topcoated and to prevent any blistering from solvent entrapment, the substrate temperature should be increased slowly at a rate of 1 - 2°C per minute to 177°C - 204°C (350°F - 400°F) and held for 2 hours

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SYSTEM SPECIFICATION

Insulated and non-insulated service: applied direct to ambient or hot carbon steel

- Option 1 for insulation service:
- PPG HI-TEMP 1027: minimum 250 µm (10 mils) DFT continuous application using multiple spray passes. Refer to application guide for additional details
- Option 2 for insulation service (two coat system):
- PPG HI-TEMP 1027: 75 to 100 µm (3.0 to 4.0 mils) DFT
- PPG HI-TEMP 1027: 175 to 200 µm (7.0 to 8.0 mils) DFT
- Option 3 for high corrosive condition (C4-C5) without topcoat and when sea transportation is necessary:
- PPG DIMETCOTE 9: 50 to 75 µm (2.0 to 3.0 mils) DFT
- PPG HI-TEMP 1027: 200 to 250 µm (8.0 to 10.0 mils) DFT

Notes:

- Hot application is not applicable to PPG DIMETCOTE 9
- Systems with PPG DIMETCOTE 9 as a primer can withstand service temperatures up to 650°C (1200°F) provided that DFT for PPG DIMETCOTE 9 is comprised between 50 to 63.5 µm (2.0 to 2.5 mils)

Insulated and non-insulated service: applied direct to ambient or hot stainless steel

- PPG HI-TEMP 1027: 150 to 250 µm (6.0 to 10.0 mils) DFT continuous application with multiple spray passes

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Primer/topcoat system – non-insulated service: applied direct to ambient or hot carbon and stainless steel

- PPG HI-TEMP 1027: 175 to 200 µm (7.0 to 8.0 mils) DFT
- Compatible PPG HI-TEMP topcoats to their respective maximum service temperatures: PPG HI-TEMP 500 or PPG HI-TEMP 1000. Consult a PPG representative for application to hot substrates.

INSTRUCTIONS FOR USE

- PPG HI-TEMP 1027 is a heavy bodied material; use mechanical agitation for mixing immediately before application and as needed during application. Be sure any settled solids are incorporated during mixing. If thinning is needed, thin only with PPG thinners and in accordance with applicable regulations. Agitate as needed during application.
- For application to hot substrate, apply multiple thin passes of PPG HI-TEMP 1027. This process, similar to mist coating, prevents blistering and also allows solvent to escape. If blisters are observed, immediately brush out the blisters before they set, using a wire brush.
- Spray application is recommended, but when it is not possible, may be applied using roller or brush. For more specific instructions regarding roller and brush application, refer to the "PPG HI-TEMP 1027 Application guidelines".

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Air spray

- No thinner is recommended

Nozzle orifice

1.8 – 2.2 mm (approx. 0.070 – 0.087 in)

Nozzle pressure

0.4 - 0.6 MPa (approx. 4 - 6 bar; 58 - 87 p.s.i.)

Airless spray

- No thinner is recommended

Nozzle orifice

Approx. 0.48 mm (0.019 in)

Nozzle pressure

12.0 - 16.0 MPa (approx. 120 - 160 bar; 1741 - 2321 p.s.i.)

Note:

- Use the lowest possible spraying pressure to avoid dry spraying

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Brush/roller

Recommended thinner

Application to ambient substrate below 66°C (150°F): THINNER 21-06 (AMERCOAT 65)

Application to hot substrate at 66°C (150°F) up to 260°C (500°F): THINNER 21-25 (AMERCOAT 101); Use of other thinners could produce a fire hazard

Volume of thinner

Up to 5% THINNER can be added if desired

Note:

- Due to thixotropic nature of the paint, it is difficult to obtain a smooth film by brush, although this does not affect performance

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Cleaning solvent

- THINNER 21-06 (AMERCOAT 65)
- THINNER 21-25 (AMERCOAT 101)

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ADDITIONAL DATA

Spreading rate and film thickness	
DFT	**Theoretical spreading rate**
125 µm (5.0 mils)	5.8 m^2/l (231 ft^2/US gal)
150 µm (6.0 mils)	4.8 m^2/l (192 ft^2/US gal)
200 µm (8.0 mils)	3.6 m^2/l (144 ft^2/US gal)
250 µm (10.0 mils)	2.9 m^2/l (115 ft^2/US gal)
300 µm (12.0 mils)	2.4 m^2/l (96 ft^2/US gal)

Overcoating interval for DFT up to 250 µm (10.0 mils)					
Overcoating with...	**Interval**	**10°C (50°F)**	**20°C (68°F)**	**38°C (100°F)**	**150°C (302°F)**
itself	Minimum	24 hours	8 hours	5 hours	15 minutes
	Maximum	Unlimited	Unlimited	Unlimited	Unlimited
PPG HI-TEMP 500 or PPG HI-TEMP 1000	Minimum	24 hours	8 hours	5 hours	15 minutes
	Maximum	Unlimited	Unlimited	Unlimited	Unlimited

Curing time for DFT up to 250 µm (10.0 mils)			
Substrate temperature	**Dry to recoat/topcoat**	**Dry to handle/ship**	**Dry to insulate/service**
10°C (50°F)	16 - 24 hours	36 hours	3 days
20°C (68°F)	6 - 8 hours	24 hours	48 hours
38°C (100°F)	4 - 6 hours	16 hours	36 hours
150°C (302°F)	15 minutes	N/A	N/A

Notes:

- For insulation, the drying times have to be doubled from dry to handle time to ensure sufficient solvent evaporation
- Drying times can vary based on environmental and substrate conditions. Do not exceed maximum dry film thickness recommendations as this can affect dry times
- When operating temperature is less than 150°C (300°F), the coating is tough and durable. PPG HI-TEMP 1027 will increase and maintain a hardeness of 2H when it is heated more than 150°C (300°F)

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SAFETY PRECAUTIONS

- The product is for use only by professional applicators in accordance with information in this product data sheet and the applicable material safety data sheet (MSDS). Refer to the appropriate MSDS before using this material. All use and application of this product should be performed in compliance with all relative federal, state and local, health, safety and environmental regulations or in compliance with all pertinent local, regional and national regulations as well as good safety practices for painting, and in conformance with recommendations in SSPC PA 1, “Shop, Field and Maintenance Painting of Steel.”

WORLDWIDE AVAILABILITY

It is always the aim of PPG Protective & 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

- Information sheet | Explanation of product data sheets
- Guide | PPG HI-TEMP 1027 | Application guidelines

WARRANTY

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

LIMITATIONS OF LIABILITY

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