

PPG HI-TEMP 1027™ APPLICATION GUIDE

INTRODUCTION

PPG HI-TEMP 1027 is a single-component, high-build, heat-resistant, inert multipolymeric matrix/inorganic ceramic coating. The coating is designed to prevent corrosion for both under insulation and non-insulated surfaces at temperatures ranging from cryogenic -196°C (-320°F) to 650°C (1200°F) for both carbon and stainless steel substrates. This document provides details for the application of the PPG HI-TEMP 1027 and is a supplement to the Product Data Sheet and Material Safety Data Sheet.

GENERAL DESCRIPTION

The PPG HI-TEMP 1027 coating contains a proprietary blend of inhibitors and barrier pigments to prevent water penetration and chloride leaching. The coating is high-build and air dries through solvent evaporation. It may be hot applied. When operating temperatures are under 150°C (300°F) the coating is tough and durable and form a stable film typically greater than 5B (ASTM D3363). After exposure to temperatures greater than 150°C (300°F), the coating will increase in density and hardness. PPG HI-TEMP 1027 will provide protection under normal atmospheric exposures. Physical and performance properties will reach a maximum after exposure to temperatures above 150°C (300°F). The auto-ignition temperature for this coating is 454°C (850°F).

SPECIFICATION CONSIDERATIONS

The general pH performance range of PPG HI-TEMP 1027 is 5 to 9. The concentration levels of acid and caustic condensate should not exceed 5%. Important factors prior to specifying the PPG HI-TEMP 1027 coating include the cyclic conditions, analysis of combustion flue gas composition conditions, and special consideration for operating conditions which do not exceed 150°C (300°F). For additional guidance, consult PPG Technical Support.

SURFACE PREPARATION

Generally, the greater amount of surface preparation, the higher adhesion of PPG HI-TEMP 1027 coating.

For specific instructions regarding surface preparation of carbon and stainless steels, refer to the PPG HI-TEMP 1027 Product Data Sheet. Additional information not detailed in the Product Data Sheet is as follows:

Water jetting/pressure washing

- Clean per SSPC-SP WJ-2 or WJ-3
- Refer to the light to moderate rusting standard within SSPC-VIS 4 for a visual acceptance standard
- Application of the PPG HI-TEMP 1027 coating should begin as soon as the surface has dried

THINNING

- Thinning can change application properties. Thin only in accordance with all applicable regulations
- The PPG HI-TEMP 1027 coating may not need thinning during typical spray application
- The PPG HI-TEMP 1027 coating may be thinned for brush and roller application.
- The PPG HI-TEMP 1027 coating may be thinned for application to hot substrates between 66°C (150°F) and 316°C (600°F).
- A maximum of 5% thinner should be used



PPG HI-TEMP 1027™ APPLICATION GUIDE

MIXING

The PPG HI-TEMP 1027 coating is a single-component, heavy-bodied material that tends to settle during storage; when opening the can the liquid phase will be at the top. Mechanically agitate with a jiffy mixer or similar tool, mix until the coating is a uniform and all the solids have incorporated. A shaker does not typically mix the coating properly. Be sure that any settled solids are incorporated during mixing.

APPLICATION

The coating, as a heavy-bodied material, should always be applied in multiple, thin passes to build proper DFT and allow the solvent to evaporate evenly. The PPG HI-TEMP 1027 Product Data Sheet provides guidance, as spray equipment, settings, pressure, and tip sizes are also important factors for a proper application of the coating. For applications between 260°C (500°F) and 316°C (600°F), consult PPG Technical Support.

Spray application ambient 10°C to 66°C (50°F to 150°F)

- Spray application is recommended for application whenever possible. Conventional, HVLP or airless spray applications will provide a smoother finish rather than roll and brush application. HVLP or conventional spray equipment should be used for coating smaller diameter piping and intricately shaped substrates to ensure control
- Maintain constant distance from substrate during application to prevent dry spray. For difficult to coat areas such as bolt rings or flanges, spray apply the substrate followed by a natural hair bristle brush to coat the remaining areas
- The dried coating surface may be similar to fine sand paper
- Keep the material mixed or regularly agitated during spraying

Spray application onto hot substrates 66°C to 316°C (150°F to 600°F)

- The applicator and owner are responsible for health, safety, and environmental compliance to the regional requirements. Please see the PPG Information Sheet Safety Considerations for Application of Specialty High Temperature Coatings to Hot Surfaces for additional guidance
- Conventional or HVLP spray equipment is recommended for hot applications over 150°C (300°F) as more application passes of coating material are required to properly build DFT and may be more difficult than with airless spray equipment.
- Maintain constant distance from substrate during application to prevent dry spray. For difficult to coat areas such as bolt rings or flanges, spray apply substrate followed by a natural hair bristle brush to coat the remaining areas
- The dried coating surface may be similar to rough or coarse sand paper. Special care should be taken to ensure that proper DFTs are applied
- Keep the material mixed or regularly agitated during spraying

Roller and brush application 10°C to 66°C (50°F to 150°F)

- Use a short nap (1/4" or less) non-shedding, solvent-resistant roller or natural hair bristle brush such as boar hair
- Saturate the roller or brush. Apply by rolling or brushing in one direction only to lay the PPG HI-TEMP 1027 coating onto the substrate in a uniform film
- Care must be taken to ensure that minimum DFT requirements are achieved when rolling or brushing due to the rough texture of the dried coating
- Keep the material mixed or regularly agitated during application

PPG HI-TEMP 1027™ APPLICATION GUIDE

Roller and brush application onto hot substrates 66°C to 149°C (150°F to 350°F)

- Spray application should be utilized if at all possible for hot substrate application. Roll or brush application will increase in difficulty as the substrate temperature increases
- The applicator and owner are responsible for health, safety, and environmental compliance to the regional requirements Please see the PPG Information Sheet Safety Considerations for Application of Specialty High Temperature Coatings to Hot Surfaces for additional guidance
- Use a short nap (1/4" or less) non-shedding, solvent-resistant roller or natural hair bristle brush such as boar hair
- Saturate the roller or brush. Apply by rolling or brushing in one direction only to lay the PPG HI-TEMP 1027 coating onto the substrate in a uniform film
- Allow the first pass to tack up then apply subsequent passes by rolling or brushing in one direction only to build the film thickness. Typically this procedure will utilize two to three passes to achieve proper DFT
- If bubbling occurs brush out and reapply the coating
- Care must be taken to ensure minimum DFT requirements are achieved when rolling or brushing due to the rough texture of the dried coating
- Keep the material mixed or regularly agitated during application

RESULTANT FILM/STANDARD OF APPEARANCE OF DRIED FILM

- Insufficient film thickness may result in premature rusting and shortened service life. The PPG HI-TEMP 1027 coating is a barrier coating with corrosion inhibitors, requiring the fully recommended DFT to achieve its maximum corrosion protection
- The resultant film is tough and durable yet resilient such that fingertip pressure leaves no impression and light scraping will not damage or remove the coating film at ambient temperatures
- Excessive film thickness may result in a gummy, rubbery, and dry film at the end of normal drying time. Additional drying time before overcoating or placing in hot service may be required. Insufficient drying time may result in solvent entrapment, blistering, and delamination The maximum DFT limit for two coats of the PPG HI-TEMP 1027 coating is 500 µm (20 mils)
- Dry spray may result in surface rusting and areas without an effective film build and subsequent decrease in corrosion protection performance
- To improve surface quality, use single coat. If two coats are needed, mist coat without thinner prior to application of second coat. Allow to solvent to flash off prior to application of second coat

REPAIR

PPG HI-TEMP 1027 coating film defects caused by handling, or other accidental damage, are easily repaired. Repair will require cleaning of the surface with a clean water wash to remove contaminants followed by reapplication of the PPG HI-TEMP 1027 coating per the Product Data Sheet, typically by brushing.

Superficial and surface blemishes

- Lightly sand the area and water wash at low pressure
- Apply as per the Product Data Sheet

PPG HI-TEMP 1027™ APPLICATION GUIDE

Nicks, dings and scrapes

- Nicks, dings or scrapes that reach the substrate should be cleaned to the substrate, edges feathered, lightly sanded and water washed at low pressure
- Apply the PPG HI-TEMP 1027 coating as per the Product Data Sheet or specification requirements

Dry spray

- Sand, water wash and allow drying of the affected area(s)
- Apply the PPG HI-TEMP 1027 coating as per the Product Data Sheet or specification requirements

PACKAGING FOR TRANSPORT

Tight packaging materials such as shrink wrapping, taping, or direct encapsulation are not recommended as the PPG HI-TEMP 1027 coating dries through solvent evaporation. Some incorporated solvents will continue to evaporate for a period of time depending on environmental conditions. Packaging for shipment should include offset blocking with an air gap to allow for continuous airflow to aid solvent evaporation. Equipment coated with the PPG HI-TEMP 1027 coating should be handled, strapped and secured in a manner that minimizes damage to the applied coating.

APPLICATION OVER INORGANIC ZINC (IOZ) (FOR CARBON STEEL ONLY)

- PPG HI-TEMP 1027 may be used to overcoat newly applied inorganic zinc surfaces applied and cured, as per the product data sheet. Ensure that the inorganic zinc rich coating is fully cured.
- PPG HI-TEMP 1027 is compatible with ethyl silicate IOZ coating which are properly dried and cleaned. PPG HI-TEMP 1027 is not compatible with epoxy-based zinc, water-based sodium, or potassium zinc silicates.

Surface preparation for aged IOZ

- PPG HI-TEMP 1027 may be used to repair surfaces coated with aged inorganic zinc where portions of the inorganic zinc coated layer have sacrificed and the steel substrate is rusting. This includes areas where light pitting is occurring.
- assure the surface is free of salts or contaminants by using low pressure potable water wash and allowing the surface to dry completely. Any areas where rust has developed should be spot prepared by hand tool or power tool cleaning to equal ISO equivalent SSPC-SP 15, "Commercial Grade Power Tool Cleaning".
- All areas shall be free of all loose rust paint and other contaminants that may interfere with adhesion of the PPG HI-TEMP 1027 to the IOZ.

PPG HI-TEMP 1027 APPLICATION INSPECTION TEST CHECKLIST GUIDE

1. Surface preparation
 - a) Ensure surface preparation is prepared in accordance with the specification and in accordance with the Product Data Sheet
2. Coating materials
 - a) Ensure that the coating life has not exceeded the shelf life and has been stored in accordance with the Product Data Sheet
 - b) Ensure that all coating materials are mixed properly with no solids in the bottom of the cans. Mechanical mixing is required
 - c) Thinning is typically not required and should only be done as directed



PPG HI-TEMP 1027™ APPLICATION GUIDE

3. Application to ambient and or hot steel substrates
 - a) Spray application is preferred
 - b) Apply in multiple passes to achieve the proper dry-film thickness
4. Post-dry Inspection
 - a) The coating will become more firm as it dries. Use the Product Data Sheet to provide directions as to recoat times and dry time. Initially, the hardness will decrease when the substrate increases in temperature, as the coating is thermoplastic
 - b) Verify dry-film thickness by visual inspection (no holiday or destructive testing)
 - c) The coating adhesion can be verified by use of ASTM D3359 method A after 7 days with results being typically 4A to 5A
 - d) The coating can be typically removed with a screwdriver or sharp object after drying
 - e) Only if required, adhesion can also be verified by ASTM D4541 using a Type 4 or 5 self-aligning test apparatus after 7 days with a typical result of 1.4 MPa to 1.7 MPa (200 to 250 psi) cohesive failure
 - f) Pencil hardness of the coating can be checked after 3 days air dry at ambient 20°C to 30°C (68°F to 77°F) with a typical result of 4B
 - g) Any areas damaged as a result of testing need to be repaired as soon as possible

LIMITATION 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.ppgmc.com. The English text of this sheet shall prevail over any translation thereof.

The PPG logo is a registered trademark and Bringing innovation to the surface and all other trademarks herein are property of the PPG group of companies.

