

This document provides information and details for the use and application of Hi-Temp 1027. It is designed to supplement the Hi-Temp 1027 Product Data sheet (PDS) and MSDS, not to replace them.

1. Introduction

Hi-Temp 1027 is a high build, single component elevated temperature coating that is resistant to thermal shock and thermal cycling in intermittent dry and wet service. It is a surface tolerant coating that can be applied to tightly adhering rust. It is formulated to prevent corrosion under insulation (CUI) of carbon steel and to prevent corrosion during non-insulated service. It is formulated to help prevent chloride induced external stress corrosion cracking of stainless steel in both insulated and non-insulated conditions. It may be applied directly to hot surfaces, eliminating the need for costly shutdown during maintenance. It can be top coated with Hi-Temp topcoats in a full range of colors.

2. Where to apply Hi-Temp 1027

- **Carbon Steel under Insulation** - For protection against the effects of corrosion under insulation (CUI) over carbon steel at temperatures up to 1200°F [650°C], two or three coats of Hi-Temp 1027 are applied to properly prepared substrates.
- **Carbon Steel in Non-Insulated Service** - For protection of carbon steel in exposed atmospheric (non-insulated) service, a system comprised of one coat of Hi-Temp 1027 and one coat of Hi-Temp 500VS or Hi-Temp 1000VS is applied to properly prepared substrates. For areas where superior corrosion control rather than aesthetics are desired, a system of two coats of 1027 is recommended.
- **Carbon Steel where a Surface Tolerant Coating is Required** – For protection of carbon steel over rusted steel surfaces where tightly adhering rust is still present after surface preparation is complete, Hi-Temp 1027 is applied. Hi-Temp 1027 is a surface tolerant coating and may be applied to tightly adhering rust for non-insulated service as described above.
- **Stainless Steel and Duplex Steel under Insulation** - For prevention of chloride induced external stress corrosion cracking of austenitic stainless steel or duplex steel under insulation two coats of Hi-Temp 1027 are applied to properly prepared substrates. This will protect the stainless steel during severe cyclic service and at peak temperatures.
- **Stainless Steel Cryogenic Service under Insulation** - For prevention of chloride induced external stress corrosion cracking of austenitic stainless steel under insulation exposed to cryogenic conditions, the specified number of coats and thicknesses (DFT) of Hi-Temp 1027 should be applied in accordance with the product data sheet (PDS) recommendations.
- **Stainless Steel and Duplex Steel in Non-Insulated Service** - For prevention of chloride induced external stress corrosion cracking of austenitic stainless steel or duplex steel in exposed atmospheric (non-insulated) service, a system comprised of one coat of Hi-Temp 1027 and one coat of Hi-Temp 500VS or Hi-Temp 1000VS shall be applied to properly prepared substrates. An alternate system for this application would be two coats of Hi-Temp 1027.

- **For Insulated and Non-Insulated Service**, an optional third coat may be applied to provide extra corrosion protection where excessive pitting, long term storage or long term transport is expected. The total film thickness can be built up to 18 mils [450 microns] DFT.

Under certain circumstances, such as in a fabrication shop on new construction, two coats of Hi-Temp 1027 at 8 to 9 mils [200 to 250 microns] DFT each coat may be applied to provide extra protection. Contact Hi-Temp 1027 for specific project recommendations when considering application of Hi-Temp 1027 at greater than 5 to 6 mils [125 to 150 microns] per coat.

3. Surface Preparation for Carbon Steel

Surface Preparation for Hi-Temp 1027 applied over carbon steel will be dependent on the type of service, environment, age and condition of the surface, and on available and allowed methods of surface preparation.

As with all coatings, the performance and service life of Hi-Temp 1027 are relative to the quality of the surface preparation accomplished.

All surfaces to be coated with Hi-Temp 1027 shall be free of all weld splatter, oil, dirt, grease, and all other contaminants, especially salts. Round off all rough welds and sharp edges.

Refer to the Hi-Temp 1027 PDS for specific instructions regarding surface preparation. Separate instructions for non-insulated surfaces and for insulated surfaces are presented in the Hi-Temp 1027 PDS.

If waterjetting methods are used for surface preparation:

- Light to moderate flash rusting per SSPC-VIS 4 "Waterjetting" is acceptable on properly prepared carbon steel surfaces and may be coated with Hi-Temp 1027.
- Application of Hi-Temp 1027 should begin as soon as possible after the surface has dried.

4. Surface Preparation for Stainless Steel

All surfaces to be coated with Hi-Temp 1027 shall be free of all weld splatter, oil, dirt, grease, and all other contaminants, especially salts. Round off all rough welds and sharp edges.

Refer to the Hi-Temp 1027 PDS for specific instructions regarding surface preparation.

IMPORTANT! DO NOT USE CHLORINATED SOLVENTS ON STAINLESS STEEL SURFACES. Water used should be potable grade or better and should be checked to assure minimal salt content. Do not use any chemical additives in the rinse water.

An anchor profile is not mandatory for adhesion of Hi-Temp 1027 on stainless steel surfaces, but may be accomplished with a light abrasive sweep blast using an appropriate chloride free abrasive. This may increase the performance and extend the service life of the coating.

5. Resultant Film / Standard of Appearance

When applied to ambient temperature substrates at the recommended DFT, and after 24 hours dry time at the appropriate temperature and humidity, with air movement over the coated surface, the dried film of 1027 will form a well adhered, tough coating.

The appearance of Hi-Temp 1027, when properly applied to ambient or hot substrates, exhibits a flat finish and a rough texture which has provided a satisfactory cosmetic appearance for many customers when applied to exposed (non-insulated) surfaces. However, it is not designed to provide a high degree of cosmetics and a single coat of Hi-Temp 1027 may be over-coated by Hi-Temp 500VS and Hi-Temp 1000VS topcoats to enhance the appearance and provide desired colors.

Properly applied and dried Hi-Temp 1027 may exhibit rust staining when exposed to splash and spill of salt water. This rust stain does not affect the performance of the coating. This rust stain may be removed by sanding the surface, usually removing only 2 mils [50 microns] or less of the coating. Refer to TR-1005 "Accelerated Corrosion Testing of Hi-Temp 1027", which describes testing of Hi-Temp 1027 to ASTM B-117.

6. Environmental Conditions for Application

For ambient application, the substrate temperature should be a minimum of 5°F [3°C] above the dew point. Do not apply to substrates with a surface temperature under 50°F [10°C].

The relative humidity during application and drying shall be below 85%. Dry times are listed in the Hi-Temp 1027 PDS at 50% relative humidity (RH) and will have to be adjusted (increased) for higher humidity levels.

7. Mixing of Hi-Temp 1027

Hi-Temp 1027 is a single-component, heavy-bodied material that tends to settle out during storage; it is normal to have a small amount of thin liquid at the tops of cans. Whenever possible, pour off the liquid into a clean large mixing bucket, then pour in the heavy bodied liquid, and scrape the residue from cans of Hi-Temp 1027 into the mixing bucket. Use mechanical agitation and a jiffy mixer or similar tool; continue mixing until the Hi-Temp 1027 is of uniform consistency. Be sure that any settled solids are incorporated during mixing. To assure uniformity of product during application, provide a pressure pot with mechanical agitation, or re-mix material in the airless take-up hopper as needed.

8. Pot Life / Re-Use / Recoat Window

Hi-Temp 1027 does not have a pot life. Hi-Temp 1027 is a single component coating and therefore does not have an induction time.

Tightly re-sealed cans of Hi-Temp 1027 can be used until the shelf life has expired. Do not re-use Hi-Temp 1027 which has dried out, become bodied, or has been contaminated.

There is no maximum interval for recoating Hi-Temp 1027 with itself or with an approved Hi-Temp topcoat as long as the surface is clean, dry and free of contaminants.

9. Storage / Shelf Life

Unused material should be kept in tightly sealed original containers; partly-used cans should be re-sealed to prevent evaporation of solvents.

The recommended temperature range for storage of Hi-Temp 1027 is 40°F [4°C] minimum to 120°F [49°C] maximum.

The shelf life of Hi-Temp 1027 is two years from date of manufacture. It is recommended to apply Hi-Temp 1027 within one year if possible, as it will mix more readily. The longer that Hi-Temp 1027 is on the shelf, the more effort will be required to mix it into a homogenous condition.

Containers can be turned over after 6 months in storage to minimize settling. Turning over the container several days before application will aid in mixing.

10. Spray Application of Hi-Temp 1027 Ambient and Hot Apply

Spray application of Hi-Temp 1027 is the preferred method. Whenever possible, this method of application should be used. Conventional, HVLP or airless spray applications will provide a uniform dry film thickness (DFT) and a smoother finish as opposed to roll and brush application. This is especially true with hot application of Hi-Temp 1027. The ability to meet the recommended DFT as defined by the Hi-Temp 1027 Product Data sheets during spray application will also lead to better performance of the coating.

Hi-Temp 1027 should be applied in multiple thin passes to achieve the recommended DFT for each coat. This is especially important during hot application. Avoid arcing and over reaching which can result in dry spray. For difficult to coat areas such as bolt rings or flanges, spray apply a single pass, then use a wood handled china bristle brush to coat the areas that the spray fan could not cover.

Keep the material agitated as required during spraying.

Conventional Spray – Industry standard spray equipment may be used. Typical spray equipment settings are described in the Hi-Temp 1027 PDS. HVLP equipment may be utilized to comply with local environmental regulations.

Conventional spray is recommended for coating small diameter piping, small, intricately shaped equipment, and pitted, aged steel.

Conventional or HVLP spray is recommended for hot applications over 300 °F [149 °C].

Airless Spray – Industry standard spray equipment, delivering up to 3000 PSI may be used. Typical airless spray equipment settings are as follows:

- Pressure 750 to 1200 PSI at the spray gun
- Distance from Substrate 18" to 24"
- Tip Size .019" preferred
- Fluid line ¼" to 3/8"

Airless spray is recommended for coating large, relatively consistent surfaces.

11. Roller and Brush Application

Ambient Application Roller and Brush:

When applying by roller, each coat of Hi-Temp 1027 will require application in thin passes to achieve the recommended dry film thickness. Use a short nap (1/4" or less) non-shedding, solvent resistant roller. Apply the first pass by **rolling in one direction only**, to lay the 1027 onto the substrate in a uniform film. Allow the first pass to tack up (10-15 minutes, depending upon conditions) then apply subsequent passes to build the film thickness, **only rolling in one direction**. Typically this procedure will utilize 2-3 passes, with tack time between passes, to achieve the 5-6 mils DFT for each individual coat.

When brushing to touch-up or to coat small areas, use a wood handled high quality china bristle brush. Wet out the surface, and then apply additional even layers to achieve the 5-6 mils DFT.

Care must be taken not to over build each coat of Hi-Temp 1027 when rolling or brushing.

If a second or third coat of Hi-Temp 1027 is required, refer to the Hi-Temp 1027 PDS for the proper recoat interval / time between coats, then apply the additional coat, following the same procedure used for rolling or brushing the first coat.

Hot Application Roller and Brush:

Hot application of Hi-Temp 1027 by roll and brush is difficult. The level of difficulty increases with the temperature of the substrate, especially at temperatures over 300°F [149°C]. If at all possible, spray application should be utilized.

For hot application of Hi-Temp 1027 by roller or brush, use the same procedure and technique as for ambient application as described above, with the following additional guidelines:

- Applying Hi-Temp 1027 by roller and brush may result in an uneven application with variation in the resulting DFT.
- Hi-Temp 1027 must be applied in thin layers to prevent solvent entrapment at elevated temperatures.
- Hi-Temp 1027 may need to be thinned during hot application. Refer to the thinning section in this document for recommended thinners.

12. Thinning and Cleanup

Hi-Temp 1027 does not need to be thinned during normal application. Thinning significantly changes the application characteristics, viscosity and adhesion properties of Hi-Temp 1027.

If the situation warrants thinning, use Hi-Temp thinner #10 or #11 up to a maximum of 5% (6 ounces [180 ml] per gallon) for applications below 150°F [66°C]. Use Hi-Temp thinner #5 for application to hot substrates between 150° [66°C] and 500°F [260°C] up to a maximum of 12% (15 ounces [445 ml] per gallon), as required. For applications between 500°F [260°C] and 600°F [316°C], consult Hi-Temp technical service. Always thin in accordance with local applicable regulations.

For cleanup of equipment and spray lines, any of the Hi-Temp thinners may be used. Xylene is a suitable alternative for cleanup.

13. Possible Application Defects

Application of insufficient film thickness of Hi-Temp 1027 results in a coating film which is subject to pinpoint rust-through or other defects, and a shortened service life. Hi-Temp 1027 is a barrier coating, requiring the full recommended DFT to achieve its maximum corrosion protection.

Application of excessive film thickness of Hi-Temp 1027 results in a gummy, rubbery dry film at the end of normal drying time, and requires additional drying time before being over-coated or placed in hot service. If the additional drying time is not allowed, the excessively thick Hi-Temp 1027 is subject to solvent entrapment, blistering and potential shortened service life.

Application of dry-sprayed Hi-Temp 1027 results in areas with insufficient DFT and loss of corrosion protection.

14. Repair

Damage to surfaces coated with Hi-Temp 1027 caused by shipping, handling, or accidental abrasion may be repaired. Any repair will require cleaning of the surface in the affected area to remove any salts and contaminants.

Repair of Coating Damage that Reaches the Substrate:

If there are nicks, dings, or scrapes that reach the substrate, then the affected area should be either blasted, power tooled or hand tooled to the bare substrate with feathered edges, then the prepared area should be coated with Hi-Temp 1027.

Repair of Superficial and Surface Blemishes

- Lightly sand the area
- Blow off clean or power wash at low pressure
- Spray, roll or brush Hi-Temp 1027 to achieve the recommended DFT

Repair of Dry Spray Conditions

- Lightly sand the area
- Blow off clean or power wash at low pressure
- Apply a coating of Hi-Temp 1027 to achieve the recommended DFT required.

15. Packaging for Transport:

Hi-Temp 1027 dries through solvent evaporation and as such tight packaging like shrink wrapping is not recommended. Due to the high build, solvents will continue to evaporate, even after seven days.

Packaging for shipment should include offset blocking with an air gap to allow for continuous solvent evaporation. An air gap must be present between the surface and the packaging material. No taping, shrink wrap or direct encapsulation is recommended.

16. Health and Safety

Hi-Temp 1027 is intended for use by professional applicators in accordance with the information provided in the Hi-Temp 1027 Product Data Sheet (PDS). The MSDS is supplied by Hi-Temp Coatings with each shipment of product, and it may also be accessed and printed from our website www.hitempcoatings.com. Refer to the MSDS for the required information regarding the potential hazards of Hi-Temp 1027 and for the HSE requirements to safely apply it.

Hi-Temp 1027 must be applied in accordance with all job site regulations and safety requirements, as well as all local, state and federal regulations that govern the location where the paint is being applied.

As with any solvent based coating, confined space application of Hi-Temp 1027 to ambient or hot substrates without proper monitoring and ventilation from an HSE perspective is not recommended.

Worker Safety and Fatigue are major concerns when working near hot surfaces. The employer and the employer's Health Safety and Environmental staff hold final responsibility for all aspects of work safety. Any project involving surface preparation and coating of hot surfaces must be properly planned and executed by competent, experienced personnel with approval of and supervision of safety authorities from the contractor and facility owner.

The auto ignition temperature of 1027 is between 850°F [454°C] and 900° [482°C]. The recommended upper limit for hot application is 600°F [316°C]. Therefore, combustion should not be a safety concern.

17. Other Applications for Hi-Temp 1027

Galvanized Steel – If a primer is requested, Hi-Temp 1027 may be applied over galvanized steel. Surface preparation prior to application of Hi-Temp 1027 shall be in accordance with ASTM D6386; “Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting”. One coat of Hi-Temp 1027 shall be applied soon after surface preparation is complete in accordance with the timeframes designated in ASTM D6386.

Over Newly Applied Inorganic Zinc – Hi-Temp 1027 may be used to overcoat newly applied Inorganic Zinc surfaces exposed to the atmosphere (non-insulated). There are many instances, such as shop fabrication, where this system will be cost effective. For newly applied inorganic zinc, assure the surface is free of dry spray, salts or contaminants, by using low pressure potable water wash and allowing the surface to dry completely. Hi-Temp 1027 must be applied within 24 hours after surface preparation is complete.

For Repair of Aged Inorganic Zinc – Hi-Temp 1027 may be used to repair surfaces coated with aged Inorganic Zinc where portions of the zinc coated metal layer have sacrificed and the steel substrate is rusting. This includes areas where light pitting is occurring. For aged inorganic zinc, 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 develops after pressure washing should be spot prepared by hand tool or power tool cleaning to equal SSPC SP-15, “Commercial Grade Power Tool Cleaning”. Alternately, a light abrasive sweep is recommended for improved adhesion of the Hi-Temp 1027, but is not mandatory. Apply a touch up coat of Hi-Temp 1027 to all areas where the zinc is depleted or non-existent. After touch up, apply a full coat of Hi-Temp 1027 to the entire unit. Repair of previously coated inorganic Zinc surfaces by over-coating with Hi-Temp 1027 will extend the service life of the repaired unit due to the protective barrier afforded by Hi-Temp 1027.

Aluminum, Copper, Nickel and Chrome Alloys – Hi-Temp 1027 is not recommended for application over these surfaces.

For application of Hi-Temp 1027 on any substrates not mentioned above, please contact Hi-Temp Technical Service.

18. Further Information

For answers to questions regarding Hi-Temp 1027 or any Hi-Temp Products, please refer to our website www.hitempcoatings.com, e-mail Hi-Temp Coatings at info@hitempcoatings.com or call us at 978-635-1110 and ask for Technical Service.