

Application Instructions
STEEL-IT® 5904
High Temp & Corrosion-Resistant Coating

***Surface Preparation, Application Instructions, and
Recommended Spray Gun Equipment Settings***



Table of Contents

<u>TOPIC</u>	<u>PAGE</u>
Introduction	1
Color Change Information	1
1. Preparation	
• Surface Preparation	2
• Required Ambient Conditions	3
• Safety	3
• Sufficient Agitation in Place of Adding Thinner	3
2. Application	
• Film Thickness	4
• Properly Measuring STEEL-IT Coatings' Film Thickness	4
• Curing Instructions	4
• Expected Coverage	5
3. Thinning and Cleanup	
• Thinning	5
• Cleanup	5
4. Suggested Spray Gun Equipment Settings	
• Spray Gun Equipment Types Evaluated	6
• STEEL-IT 1002 Polyurethane Topcoat	6

INTRODUCTION

STEEL-IT 5904 High Temp & Corrosion-Resistant Coating is a single-component 316L stainless steel pigmented silicone finish designed for high temperature applications where surface temperatures will normally or periodically exceed 400°F (204.4°C).

STEEL-IT 5904 can withstand constant temperatures of 1,000°F (537.8°C), with spikes to 1,200°F (649°C).

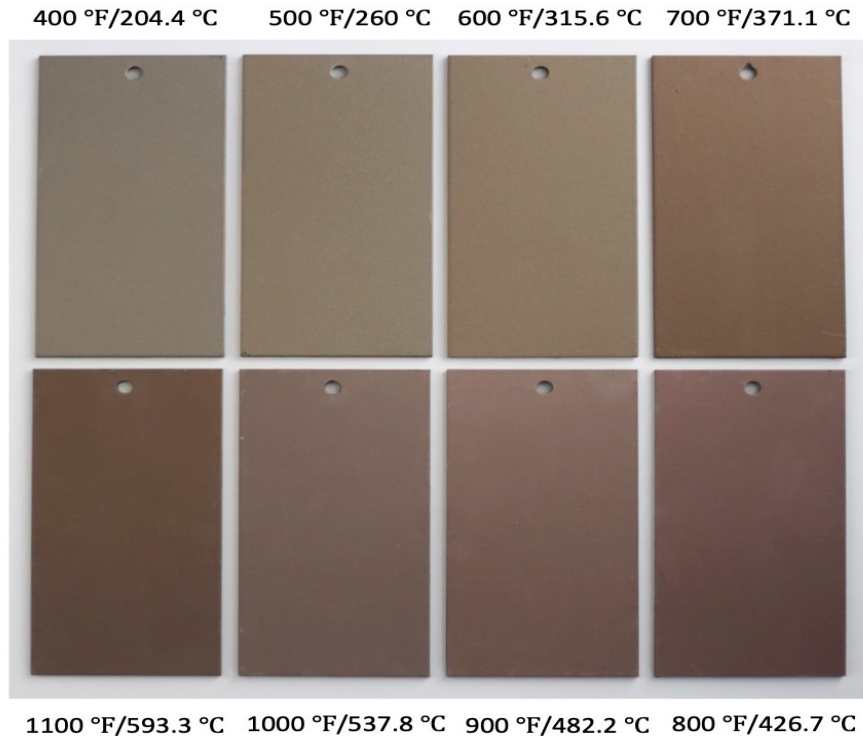
STEEL-IT 5904 is self-priming and does not require a primer or precoat. The use of other primers is discouraged as the coating must be free to form bonds with the bare steel at high temperature. Clean surfaces and adequate surface preparation are critical.

STEEL-IT 5904 High Temp requires a 60 minute bake cycle at 400° F (204.4°C) to cure properly and to attain optimum hardness and durability.

Further curing will take place in service as the coating chemically converts to form a complex silicone/stainless steel matrix that bonds tenaciously to well-blasted metal. STEEL-IT 5904 will air dry at room temperature but it WILL NOT CURE without baking. It will be dry to the touch for handling, but should not be wrapped or strapped for shipping before baking.

COLOR CHANGE INFORMATION

STEEL-IT 5904 High Temp is a gray color, which changes to (and remains) various shades of a reddish-chocolate brown starting at about 600°F (315.56°C).



1. PREPARATION

Proper surface preparation is key to the success of any coating job, whether the coating is STEEL-IT or another brand. It's often said in the coatings industry that roughly 85% of all paint failures are due to improper or insufficient surface preparation and application.

STEEL-IT coatings adhere to metal surfaces through mechanical adhesion, meaning the coating holds onto the surface by interlocking with a rough profile established on the bare metal, which is ideally achieved by grit-blasting or power-sanding.

SURFACE PREPARATION

Metal surfaces should be clean and free of all rust, old paint, greases, waxes, salts, dirt, scale, etc.

It's best if the surface being coated can be grit-blasted (e.g. sandblasted) to a 1.5 - 2.0 mils (0.0015" – 0.0020"; 38-50 microns) sharp angular cut profile per SSPC SP-6 (Commercial Blast). STEEL-IT coatings require this rough, "scarified" surface profile in order to have some tooth to bite into to adhere properly.

If blasting is not an option, power-sanding (e.g. with a dual-action sander or random orbital sander) using #36 grit sandpaper will achieve similar results on steel. The surface once properly prepared should feel like the striking area on a matchbox.

After grit-blasting, blow any remaining grit material off using an air hose and/or solvent clean the surface with acetone or alcohol. Avoid using products that leave behind an oily residue (such as mineral spirits).

Another surface preparation option is to use the Monti Bristle Blaster, a power tool that also achieves proper surface conditions. Stainless Steel Coatings, Inc. has no affiliation with Monti; it is merely an available option in the marketplace. For more information, visit:

<http://www.monti.de/en/products/bristle-blaster>

REQUIRED AMBIENT CONDITIONS

When using STEEL-IT 5904 High Temp & Corrosion-Resistant Coating:

- Apply only when ambient and substrate surface temperatures are between 50° F (10° C) and 100° F (38° C)
- Relative humidity is less than 85%
- Substrate surface temperature and the temperature of the coating are at least 5° F (2.75° C) above the dew point.

SAFETY

Apply the coating in a well-ventilated area.

When applying STEEL-IT 5904 High Temp, it is critical to use:

- A NIOSH-approved respirator using an organic vapor cartridge
- Nitrile gloves

SUFFICIENT AGITATION IN PLACE OF ADDING THINNER

Before applying STEEL-IT, **it is critical that the contents be sufficiently agitated for five minutes**. This can be accomplished using a mechanical paint shaker or a mechanically driven paddle, at the end of a drill, for example. Hand stirring using a wooden stick will not provide sufficient agitation to properly prepare STEEL-IT for application.

Unlike with other paints and coatings where agitation or stirring is required to assure the homogeneity of the can's contents, in the case of STEEL-IT, agitation plays the critical role of adding enough energy into the coating to break temporary chemical bonds that have formed and thickened the coating as it's sat in the can. Adding energy makes the can's contents less viscous thus eliminating the need for thinners and readying STEEL-IT for application.

If agitated properly, STEEL-IT coatings should not require thinning with solvents before use. **Adding thinner or reducer is highly discouraged** because it increases the chance of trapping solvents and may negatively affect the coating's proper drying and curing processes. While a very limited amount of reducer can be added if absolutely necessary (no more than 5%), adding too much solvent will alter the coating's chemistry.

2. APPLICATION

FILM THICKNESS

For STEEL-IT 5904 High Temp & Corrosion-Resistant Coating, proper application is a **single coat at 2-3 mils (0.002”-0.003”;** **51-75 microns) DFT** (Dry Film Thickness).

To achieve 2-3 mils (0.002”-0.003”;

 51-75 microns) DFT of the STEEL-IT 5904 High Temp, the following Wet Film Thicknesses (WFT) should be applied per coat:

STEEL-IT BRAND COATING	NUMBER OF MILS (MICRONS) TO APPLY WET TO GET 2-3 MILS (51-75 MICRONS) DRY
STEEL-IT 5904 High Temp & Corrosion-Resistant Coating	4 mils WFT (.004”;

STEEL-IT 5904 has a high solids content, so it is not necessary to apply a thick wet film to achieve the necessary film build. **Additional coats are not recommended.** More is not better in this case, and the coating will not dry to the touch if improperly applied.

PROPERLY MEASURING STEEL-IT® COATINGS' FILM THICKNESS

The amount applied should be measured when the coating is wet using a wet film thickness gauge, which is a very simple tool. A useful demonstration of how to use such a gauge can be found on YouTube at: <http://www.youtube.com/watch?v=DtmEBBzIWQc>.

When using STEEL-IT brand coatings, many electronic gauges used to measure dry film thickness give seriously inaccurate results. Such gauges try to locate the substrate, and then measure the distance from the tool to the substrate and conclude that that is the thickness of the coating. Due to the abundance of stainless steel in STEEL-IT coatings, most electronic gauges often misinterpret this barrier coat as the substrate and report too little coating has been applied. For more information on which electronic gauges can be used with STEEL-IT, please contact: info@steel-it.com.

CURING INSTRUCTIONS

After applying one coat at the recommended thickness, **the coating must be baked at 400°F (204.4°C) for a minimum of 60 minutes to cure.**

Where baking is not possible, the system can cure over time with the heat of being in service if the entirety of the coated surface evenly reaches at least 400°F (204.4°C) for a minimum of 1 hour (60 minutes) in the initial run.

EXPECTED COVERAGE

STEEL-IT® COATING	PRACTICAL COVERAGE AT 2-3 MILS (75 MICRONS) DFT*
STEEL-IT 5904 High Temp & Corrosion-Resistant Coating	<ul style="list-style-type: none"> • 300 sq ft/gallon (27.87 sq m/gal) • 75 sq ft/quart (6.97 sq m/quart)

* Assumes 20% loss due to overspray and waste

3. THINNING AND CLEANUP

THINNING

Adding thinner or reducer is highly discouraged.

If it is absolutely necessary to add thinner, use Xylene and do not dilute the coating more than 5%.

CLEANUP

To clean spray guns and other application equipment after applying the STEEL-IT 5904 High Temp, the following solvents should be used immediately after spraying:

•	STEEL-IT BRAND COATING	SOLVENTS FOR CLEANUP
	STEEL-IT 5904 High Temp & Corrosion-Resistant Coating	Mineral Spirits, Xylene, or Hi-flash Naphtha.

4. SUGGESTED* SPRAY GUN EQUIPMENT SETTINGS FOR USE WITH STEEL-IT® 5904 HIGH TEMP & CORROSION-RESISTANT COATING

This section provides settings recommendations for commonly used types of spray gun equipment for use with STEEL-IT 1002 Steel Polyurethane Topcoat.

Many of these setting may also be appropriate with STEEL-IT 5904 High Temp & Corrosion-Resistant Coating; formal tests are being conducted.

It may be necessary to use a slightly narrower fluid nozzle/tip or different pressure settings than those used with STEEL-IT 1002 Polyurethane.

The recommendations that follow provide a good starting point for experimentation in determining the best equipment and settings to use with STEEL-IT 5904 High Temp & Corrosion-Resistant Coating. Actual settings may differ due to equipment manufacturer, altitude, or weather conditions. However, the recommendations found on the two pages that follow should provide a useful starting point.

STEEL-IT 1002 STEEL GRAY POLYURETHANE TOPCOAT

Conventional Gravity Feed Air Spray Guns

- Transfer efficiency (est.) 25%
 - Fluid nozzle: 2.2-2.7 mm
 - Flow rate:
 - Without atomizing air: 3 oz./min.
 - With atomizing air: 6 oz./min.
 - Air pressure: 60 psi (high, but not uncommon for viscous coatings)

Conventional Pressure Feed Air Spray Guns

- Transfer efficiency (est.) 30%
 - Fluid nozzle: 1.8 mm with ¼" fluid hose
 - Flow rate 6 oz./min.
 - Air pressure 40 psi
 - Fluid pressure on pot: 50 psi

Heated HVLP Guns

- Transfer efficiency (est.) 60%
 - Fluid nozzle: 1.8 mm
 - Flow rate: 8 oz./min.
 - Fluid pressure on pot: 40 psi
 - Inline heater temp: 110°F

Airmix (“AAA”, or “Air Assisted Airless”) Guns:

- Transfer efficiency (est.) 80%
 - Tip: .015
 - Flow rate: 14 oz./min.
 - Fluid pressure: 1000 psi.
 - Air pressure when triggered: 10 psi.

Heated Airmix (“Heated AAA”, or “Heated Air Assisted Airless”) Guns

- Transfer efficiency (est.) 80%
 - Tip: .015
 - Flow rate: 16 oz./min.
 - Fluid pressure: 1000 psi.
 - Air pressure when triggered: 10 psi
 - Inline heater temperature: 110° F

Airless Guns

- Transfer efficiency (est.) 50%
 - Tip: .016 airless
 - Flow rate: 18 oz./min.
 - Fluid pressure when triggered: 1000 psi

NOT RECOMMENDED

Conventional Siphon Feed Air Spray Guns:

- With either a 1.8mm or 2.2 mm fluid nozzle, the product is too viscous to siphon smoothly, unless excessive pressures (90+ lbs) are used.

HVLP Guns

- At the EPA recommended limit of 10 psi at the air cap, atomization is unacceptable, even at rates as low as 4 oz./min.