

## STEEL-IT Polyurethane

1002, 1006, 1012, 1050, 1051

1K Polyurethane-Coating with stainless steel particles

### Description:

STEEL-IT Polyurethane Coatings are liquid one-component products consisting of synthetic resin and stainless steel particles. After application, the solvents contained volatilise, leaving a very hard, resistant layer of 316L stainless steel and synthetic resin on the coated surface.

The Polyurethane Coatings have very good adhesion to steel, galvanised steel, aluminium, nickel-plated steel, copper, brass and other non-porous surfaces. The coating adheres to the surface by interlocking with the rough surface profile. The stainless steel coating offers unique, high-quality corrosion protection and provides the surface with excellent protection against impact, abrasion, moisture, solvents, alkalis, UV radiation and much more. The stainless steel coating is non-toxic. 1002, 1050 and 1051 comply with USDA guidelines for incidental food contact and can be used in the food industry. The weldability of the stainless steel layer is a decisive and time-saving advantage. Early signs of damage are easy to recognise and can be repaired by directly welding the coating without mechanical pre-treatment.

### Technical Data:

|  | 1002                   | 1006                   | 1012                   | 1050                   | 1051                   |
|--|------------------------|------------------------|------------------------|------------------------|------------------------|
| colour                                   | Steel Gray (matte)     | Charcoal (matte)       | Black (satin)          | Dove Gray (satin)      | Light Gray (satin)     |
| closest RAL                              | 7039                   | 7022                   | 9004                   | 7035                   | -                      |
| solids by weight:<br>by volume:          | 46%<br>38%             | 48%<br>38%             | 53%<br>42%             | 55%<br>45%             | 55%<br>44%             |
| coverage* at<br>75 µm dry film thickness | 3,73 m <sup>2</sup> /L | 3,83 m <sup>2</sup> /L | 4,42 m <sup>2</sup> /L | 4,73 m <sup>2</sup> /L | 4,63 m <sup>2</sup> /L |
| VOC                                      | 460 g/L                | 446 g/L                | 406 g/L                | 540 g/L                | 556 g/L                |

\* Assumes 20% loss due to overspray and waste

### Application:

#### Film Thickness:

For surfaces subject to normal wear, we recommend applying 2 coats with a dry film thickness of 75 µm each. For surfaces exposed to harsh conditions, the application of 3 coats is recommended.

When welding is not desired, the first coat can be replaced with 2213 Epoxy Ester Precoat (75 µm dry film thickness, 205 µm wet film thickness), which significantly improves corrosion resistance.

|                             | 1002   | 1006   | 1012   | 1050   | 1051   |
|-----------------------------|--------|--------|--------|--------|--------|
| Dry Film Thickness 1 coat   | 75 µm  | 75 µm  | 75 µm  | 75 µm  | 75 µm  |
| Dry Film Thickness 2 coats  | 150 µm | 150 µm | 150 µm | 150 µm | 150 µm |
| Dry Film Thickness 3 coats  | 225 µm | 225 µm | 225 µm | 225 µm | 225 µm |
| Wet Film Thickness per coat | 250 µm | 225 µm | 225 µm | 205 µm | 205 µm |

## Surface Preparation:

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

It is best if the surface to be coated can be blasted (e.g. sandblasted) to a 38-50 µm sharp angular cut profile (in accordance with SSPC SP-6, commercial blasting). STEEL-IT coatings require this rough, "scored" surface profile in order to have a tooth into which they can anchor and properly adhere.

If grit-blasting is not an option, similar results can be achieved on steel by sanding (e.g. with a double sander) with 36 grit sandpaper. After appropriate preparation, the surface should feel similar to the striking area on a matchbox.

After blasting, blow any remaining grit material off using an air hose and/or clean the surface with acetone, alcohol or xylene. Avoid using products that leave oily residues (e.g. cleaning petrol).

## Notes:

Apply only when:

- ambient and substrate surface temperatures are between 10°C and 38°C
- relative humidity is less than 85%.
- Temperature of substrate surface and of coating are at least 2.75 °C above the dew point.
- The climatic conditions (e.g. high humidity or high dryness) have an effect on the drying/curing time of the coating. Longer curing times may be required in higher humidity or colder climatic conditions. Spray speed and technique may need to be adjusted.

## Application method:

Power agitate the contents vigorously for five minutes. This can be done with a mechanical paint shaker or with a mechanically driven paddle, for example at the end of a drill. Stirring by hand using a wooden stick is not sufficient to properly prepare STEEL-IT for application.

Spray from a distance of 30-40 cm making multiple passes to achieve a good wet film build-up of the coating. Overlap the spray pattern by 50%. In drier and hotter climates, the spraying speed should be faster.

Apply the wet film thickness specified above for each coat to achieve 75 µm dry film thickness per coat. For proper performance, the total dry film thickness of the applied STEEL-IT coating should be 150 µm. For parts exposed to tougher conditions, we recommend a total dry film thickness of 225 µm.

Application is carried out with a conventional air spray gun, compressed air spray gun or airless gun. Alternatively, it can be applied with a brush or roller.

## Recommended Spray Gun Equipment:

Conventional Gravity Feed Air Spray Guns:

- Transfer Efficiency (est) 25%
- Fluid Nozzle: 2,2 - 2,7 mm
- Air Pressure: 60 psi

Notes: Fpro G Manual Airspray Gravity Spray Gun used with conventional air cap and a 2.2mm fluid nozzle with the cup strainer removed. The fluid nozzle and lack of strainer restriction resulted in enough fluid flow at the current viscosity to achieve a 2.5-3 inch-wide pattern using 60 psi (dynamic) of atomization air. Though restricted at this viscosity, the Fpro G could be a potential applicator choice as a low-cost option for touch-ups or small hobbyist projects.

Conventional Pressure Feed Air Spray Guns:

- Transfer Efficiency (est) 30%
- Fluid Nozzle: 1,8 mm
- Air Pressure: 60 psi

Notes: Fpro P Airspray Manual Spray Gun used with conventional air cap and a 1.8 mm fluid nozzle. 60 psi (dynamic) of fluid pressure from the Prima 1:1 diaphragm pump allowed for maximum flow at viscosity of approximately 140 ml/m (1002: 177 ml/m). With 45 psi (dynamic) (1002: 35 psi) of atomization air, a 5-6.5 inch-wide pattern was achieved (1002: 4-5 inch). Using the larger 2.3mm or 2.7mm fluid nozzles and a higher atomization air (to the higher side of conventional), you will be able to achieve a larger pattern with the same fluid pressure. With higher flowrates and longer continuous use, the Fpro P in the

conventional configuration would be a step-up in cost, but also improved performance and efficiency compared to the Fpro G.

## Airmix (AAA, or Air Assisted Airless) Guns:

- Transfer Efficiency (est) 80%
- Tip: 0.015" and 24VX HVLP air cap
- Fluid Pressure: 1000 psi (dynamic)
- Air Pressure when triggered: 12,5 psi (dynamic)

Notes: Airmix Xcite+ manual paint spray gun used with a 12-094 (0.015") tip, a 24VX HVLP air cap, and a 100 mesh in gun filter. 1000 psi (dynamic) of fluid pressure from a 30c25 3:1 piston pump providing 440 ml/m (1002: 450 ml/m) of fluid flow. With 10 psi (dynamic) (1002: 12,5 psi) of atomization air, achieved a 5-6 inch-wide pattern (1002: 8-9 inch) while staying within HVLP compliance at the air cap. The Xcite+ provides a wider range of usable spray patterns utilizing similar tip orifice size with different available tip spray angles. The tip size and pressure parameters tested worked well in the middle ground of Airmix fluid pressures, allowing flexibility with the application.

## Heated Airmix (Heated AAA, or Heated Air Assisted Airless) Guns:

- Transfer Efficiency (est) 80%
- Tip: 0.015"
- Fluid Pressure: 1000 psi (dynamic)
- Air Pressure when triggered: 10 psi

Notes: Xcite+ used with a 12-094 (0.015") tip, a 24VX HVLP air cap, and a 100 mesh in gun filter. 1000 psi (dynamic) of fluid pressure from a 30c25 3:1 piston pump providing 500 ml/m (1002: 510 ml/m) of fluid flow. With 10 psi (dynamic) of atomization air, achieved a 5-6.5 inch-wide pattern while staying within HVLP compliance at the air cap. The Xcite+ with the lower viscosity (30 seconds EZ Zahn#4) of the heated material achieves even more flexibility with the application.

## Airless Spray Guns:

- Transfer Efficiency (est) 50%
- Tip: 0.015"
- Fluid Pressure when triggered: 2000 psi (dynamic)

Notes: SFlow Airless Paint Sprayer used with a 12-13 (0.015") Tip Top reversible tip and a 100mesh in gun filter. 2000 psi (dynamic) of fluid pressure from a 40c100 40:1 piston pump providing 700 ml/m of fluid flow. With the 12-13 tip, the pattern was 8-9.5 inches wide (1002: 10-11,5). The pattern size could easily be changed with larger or smaller tip orifice sizes and tip spray angles. The SFlow would be a good applicator choice for its ease of use, possible fluid flowrates, and the easy to clean reversible tip at a loss of transfer efficiency over the Airmix technology.

## Wet/Dry Film build:

| coats   | Air dry time after application       |
|---------|--------------------------------------|
| 1. coat | 4 – 24 h                             |
| 2. coat | 5 – 7 days, when 2 coats are applied |
|         | 4 – 24 h, when 3 coats are applied   |
| 3. coat | 5 – 7 days                           |

## Drying Time:

|                       |        |
|-----------------------|--------|
| Dry to touch:         | 2 h    |
| tack-free to handle:  | 4 h    |
| dry to recoat window: | 4-24 h |

If product is not recoated within 24 h, a light scuff-sanding using #400-600 grit paper is required before applying an additional coat.

Full cure in 5-7 days after final coat. Corrosion resistance continues to improve with prolonged atmospheric aging over a 4-6 week period.

**Welding:**

- Allow a full 7-day cure prior to welding
- TIG or MIG welding
- Seamless touch-up with STEEL-IT-Aerosol

**Thinning:**

Only if absolutely necessary and only use mineral spirits. Do not dilute the coatings more than 5%  
No thinner or reducer should be used with the STEEL-IT 2213 Epoxy Ester Precoat.

**Cleanup:**

To clean spray guns and other application equipment after applying the STEEL-IT Polyurethane System, only use Mineral Spirits.