SPECIALTY POLYMER COATINGS, INC.

MANUFACTURER'S QUALIFIED APPLICATION PROCEDURE

FOR SP-8888®

BRUSH GRADE, SPRAY GRADE AND CARTRIDGES

MQAP IDENTIFIER – SP-8888 R.0

DOCUMENT REVISION HISTORY

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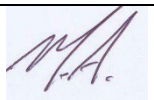
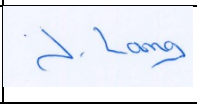
0	Feb, 2016					

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INTRODUCTION

SP-8888® is a 100% solids, epoxy novolac coating used for below ground corrosion control on pipe, piping assemblies, valve assemblies, pipe components, girth welds, horizontal directional drilling (HDD) pipe and HDD girth welds. SP-8888® is available in Spray Grade & Brush Grade, and Cartridge. This MQAP addresses the requirements outlined in CSA Z245.30 Clause 5.3.2 for SP-8888® Brush Grade, Spray Grade and Cartridge application where pipeline service temperatures do not exceed 150°C (302°F).

1.0 STANDARDS AND SPECIFICATIONS

NACE Recommended Practices / SSPC Standards – Surface Preparation:-NACE No.2/SSPC-SP-10.

2.0 DEFINITIONS

Adequate Cure - where preheating is used in cold weather application or to accelerate a cure, adequate cure shall be achieved for Shore D hardness ≥80 measured at 21˚C ± 2°C (70˚F ± 35.6˚F). For the purpose of handling the coated surface (lowering in or backfilling), adequate cure for temperatures above 10˚C (50˚F) is achieved when the coating is dry hard.

Applicator - the company which is applying the coating. Typically this is either the contractor or his subcontractor.

Contractor - those who have been contracted to prepare the surface and apply coatings covered in this specification.

DFT - Dry Film Thickness - the thickness of the coating after it has hardened to a solid state, as defined in SSPC PA2.

Dry Hard - coating does not indent when pressed forcefully with a thumbnail.

Epoxy - a two-component liquid epoxy or epoxy coating system.

Gel Time - coating begins to thicken past the point of workability.

Manufacturer - Specialty Polymer Coatings, Inc. (SPC).

Owner - pipeline owner/operator including its affiliates, engineering agencies, inspectors and other authorized representatives.

Service Temperature - the maximum operating temperature at which the coating will perform.

Sweating/Damp Pipe - any substrate to be coated or blasted is considered to be sweating or damp if its temperature is less than 3˚C (5°F) above the dew point of the air immediately adjacent to the surface.

Tacky - refers to a coating in an uncured state. Coating is said to be tacky when coating adheres to a finger contacting it.

Touch Dry Time - coating does not adhere to a fingertip when lightly touched.

WFT - Wet Film Thickness - the thickness of the coating film while in the liquid state.

3.0 COMPATIBILITY WITH OTHER ANTI-CORROSION COATINGS

SP-8888® is compatible with all SPC and fusion bonded epoxy (FBE) anti-corrosion coatings. For compatibility with other anti-corrosion coatings, please consult with SPC.

4.0 PACKAGING

Brush & Spray Grade Material

- Part ‘A’ - 3 Parts of Base (measured by volume).
- Part ‘B’ - 1 Part of Hardener (measured by volume).

Cartridge Material

- Part ‘A’ - 2 Parts of Base (measured by volume).
- Part ‘B’ - 1 Part of Hardener (measured by volume).

5.0 RECOMMENDED FILM THICKNESS

For standard corrosion protection, a DFT of 0.75 mm minimum to 1.25 mm maximum (750 microns to 1250 microns, 30 mils to 50 mils), is recommended.

For HDD and mechanical protection, a DFT of 1.00 mm minimum to 1.75 mm maximum (1000 microns to 1750 microns , 40 mils to 70 mils), is recommended.

6.0 SAFETY CONSIDERATIONS

SP-8888® is harmful if absorbed through skin, inhaled or swallowed. It is a skin and eye irritant. Personal protective equipment is required. Refer to the Safety Data Sheets for additional information.

Gloves

Hand and wrist protection shall be accomplished via selection of appropriate gloves. In cases where abrasion, nick or cut hazards exist, gloves shall be worn which are made of cotton, leather or Kevlar®. In the event hazardous chemicals are present, gloves constructed of appropriate chemical-resistant material shall be worn. The glove/clothing overlaps should be sealed by tape. Check with the glove manufacturer to determine the proper glove type.

Eye Protection

Appropriate eye protection shall be required and used when there is a probability that such protection equipment could prevent injury. Examples of such protection equipment include safety glasses with side shields, direct vent goggles and indirect vent goggles.

Safety glasses and/or goggles will not be required when the employee is using an enclosed helmet or hood assembly which is approved for providing adequate eye protection. Full-face respirators do not require safety glasses.

Face Shields

These protective devices shall be used when a potential for facial injury exists from flying debris or chemical splashes. Face shields shall not be utilized as the sole method of eye protection.

Face shields should also be considered as an additional level of eye protection when safety glasses and/or goggles are being worn.

Foot Protection

Foot protection shall be selected in regard to the potential hazard. Steel-toe footwear shall be used when the potential for toe and lower foot injury exists. In some cases, metatarsal protection will also be required. Boots constructed of an impervious material, such as neoprene, shall be required when the potential for contact with a chemical exists.

Chemical Protective Clothing (CPC)

In cases where a hazardous chemical could contact body parts, appropriate CPC shall be worn. Such clothing includes aprons, “splash” suits and totally encapsulated suits. When such clothing is required, clothing material shall be selected which resists the permeation of the hazardous chemical which is present. Long-sleeved clothing shall be worn over regular clothing to cover all exposed areas of arms, legs and torso during mixing and application of the coating. Breathable clothing, such as cotton or disposable coveralls, is recommended.

Respirator

An appropriate, properly fitted vapour respirator (NIOSH / OSHA approved), shall be worn during coating application where vapour/mist is likely to be encountered, e.g. confined spaces and during winter construction or when the substrate is preheated. For outdoor application and areas with adequate ventilation, the use of a respirator is normally not required. The respirator manufacturer’s recommendations shall be followed. A dust respirator shall be worn for any activity such as sanding or grinding of cured coating.

Other Safety Considerations

As a minimum, all selected protective equipment shall meet the requirements of the appropriate ANSI standards. Selection of such equipment shall be accomplished after completion of the pre-job safety review. After selection, changes in specific safety equipment must be approved by the job supervisor or the safety coordinator.

An emergency eyewash and a shower shall be in close proximity where possible. A barrier cream may be used, in conjunction with the stated protective measures, as an additional safeguard against skin contact.

Containers shall be kept closed when not in use. In case of spillage, the material shall be disposed of in accordance with Federal, Provincial, and Municipal regulations in Canada, and Federal, State, and County regulations in the United States of America.

No open flames, smoking or welding shall be allowed in the immediate vicinity during coating application.

Members of the coating crew shall wash thoroughly after exposure to the coating.

7.0 SURFACE PREPARATION

Surfaces to be blast cleaned shall be free of oil, grease, injurious contamination, slivers, mud, soils, burrs, weld spatter, etc. Prior to blast cleaning, the contractor shall examine the surface for contaminants. Any oil, grease or magnetic particle inspection products or ultrasonic couplant shall be removed using acetone, xylene, MEK, or non-oily solvent approved by the Owner.

The surface to be blast cleaned shall be heated to remove any moisture. The surface temperature shall be at least 3˚C (5˚F) above the dew point temperature from the time of blast cleaning until the coating is cured, but shall not exceed 100˚C (212˚F) or the Owner's maximum preheat temperature.

All surfaces to be coated shall be abrasive blasted to minimum NACE No.2 (Near-White) cleanliness. Material for abrasive cleaning shall be the appropriate blend of grit to produce an angular-surface profile of 62.5 microns (2.5mils) minimum.

The underside and narrow edges of all angles, weld beads and structural members shall be blast cleaned to minimum NACE No.2 (Near-White) cleanliness. All surfaces shall be cleaned of all loose blasting products.

Only areas that can be coated in a day shall be blast cleaned. The blast cleaning shall extend at least 50 mm (2”) past the end of the area to be coated. Any area that is allowed to sit overnight shall be returned to its original blast-cleaned condition. This requirement also applies to any blast-cleaned surface that has flash rusted as a result of exposure to rain or moisture.

If the coating operation is to continue to the following day, the edges of the area coated with SP-8888® shall be feathered down to the steel substrate.

All blasting onto existing SP-8888® shall be directed, for 50 mm (2”), from the coated surface to the adjacent substrate rather than from the substrate onto the coating.

When coating girth welds where the parent coating is FBE, polyethylene (PE), polypropylene (PP), coal tar or liquid coating, sweep blasting shall be directed from the parent coating to the adjacent substrate. The blasting shall extend 50 mm (2”) onto the parent coating.

For the repair of pinholes and holidays 150 mm (6”) or less in diameter, the repair area shall be roughened using carborundum cloth, sandpaper, file, MBX® Bristle Blaster®, or as directed by the owner. Ensure all gloss has been removed from the repair area. The adjacent coating shall be abraded for a minimum distance of 25 mm (1”) to ensure inter-coat adhesion. Dust shall be removed by wiping with a clean cloth, paint brush or with compressed air. A dust respirator shall be worn for all sanding or grinding activities. All surfaces to be coated shall be clean and completely dry prior to the application of the coating.

For repair of areas greater than 150 mm (6”) in diameter, the repair area shall be mechanically abraded using a MBX® Bristle Blaster®, blast cleaned, or as directed by the owner. Ensure all gloss has been removed from the repair area. Dust shall be removed by wiping with a clean cloth, paint brush or with compressed air. A dust respirator shall be worn for all sanding or grinding activities. All surfaces to be coated shall be clean and completely dry prior to the application of the coating.

8.0 PREHEATING AND POSTHEATING

The surface temperature of the substrate to be coated shall be maintained in the range recommended in this document from abrasive blasting through coating cure. Any preheating or accelerated curing other than what is outlined in this Section shall be approved by the manufacturer and owner. Mechanical stress, including backfilling, shall not be applied to the coating until it has reached a Shore D Hardness ≥80.

To ensure cure, the preheat temperature for the coating application shall be either:

- 65°C – 75°C (150°F-170°F) when substrate to be coated is between 10°C and -10°C (50°F and 15°F).
- 85°C – 90°C (185°F – 195°F) when the substrate is -10°C (15°F) or colder.

The preheat temperature shall be measured using a surface contact thermometer or by a method approved by the Manufacturer or Owner.

For tie-in welds, preheating shall be accomplished using a direct flame, induction coil, or catalytic infrared heater. Where direct flame is used, it shall not contaminate the surface to be coated. The surface shall be prepared in accordance with Section 7.0. Preheating shall raise the surface temperature so that coating application takes place when the pipe surface is at or above the minimum specified temperature. Where direct flame is applied, the surface shall be subsequently abrasive blast cleaned in accordance with Section 7.0.

Preheating shall not damage the existing coating or the coating being repaired, or raise the temperature of the substrate above 100°C (212°F), or owner specified maximum temperature.

Valves shall be coated in an enclosure or indoors with no direct heat applied to the valve assembly. The minimum surface temperature of 10°C (50°F) shall be maintained until 4 hours after the coating is touch dry.

Neither handling nor backfilling shall be permitted until the coating has adequately cured, as determined by the owner's inspector. Postheating, to accelerate curing, shall be performed by using an indirect method (induction, ambient temperature, forced air or infrared). Direct flame shall not be used. The postheat temperature of the coating surface shall not exceed 90˚C (194˚F) as measured by a surface contact thermometer or by a method approved by the Manufacturer or Owner. Infrared contact thermometers should only be used on coated surfaces as it can cause false readings on metallic surfaces. Valves shall not be post heated except by increasing ambient air temperature.

9.0 EQUIPMENT

Disposable tools, such as brushes or short nap mohair rollers (available from SPC), shall be used to apply SP-8888® Brush Grade.

Graco Hydra-Cat, XP-70, XM, or Xtreme Mix high pressure heated plural component spray equipment or approved equivalent shall be used to apply SP-8888® Spray Grade coating systems in accordance with SPC's recommendations and specifications. See Appendices A and B.

Cartridge Coating material shall be applied with a paint brush or spatula.

10.0 COATING APPLICATION

10.1 Brush Grade Application

A DFT of 1.25 mm (50 mils) can be applied to a vertical surface in a single application. Higher builds are possible on horizontal surfaces.

The acceptable ambient temperature range for brush grade application is -40˚C to 50˚C (-40˚F to 122°F). The acceptable substrate temperature range for application of SP-8888® Brush Grade is 10°C to 100°C (50°F to 212°F). The substrate temperature shall be a minimum of 3°C (5°F) above the dew point temperature before proceeding with coating application.

For cold weather application and to achieve an adequate cure or accelerated cure, see Section 8.0. The coating shall not be allowed to freeze before an adequate cure is reached.

An adequate cure is achieved when the Shore D hardness is ≥80. The appropriate preheat temperature and cure time can be determined from the SP-8888® Curing Table, Appendix D.

SP-8888® Brush Grade cures to a touch dry condition in 55 minutes and to a dry hard condition in 3.5 hours at 25°C (77°F).

SP-8888® Brush Grade can be overcoated without the need for an additional tie coat. Overcoating is best accomplished while the previous coat is still tacky. If the overcoating interval exceeds 120 minutes at 25°C (77°F), the surface shall be blast roughened prior to application of the overcoat. If the surface has been preheated to 80°C (176°F), the maximum overcoating interval is 3 minutes. Blast roughening shall not be attempted until the coating has dried to a dry hard condition in accordance with the SP-8888® Appendix D.

10.1.1 Mixing Instructions- Brush Grade Coating

a) Mix Part 'A' (Base) slowly with a variable speed drill fitted with a mixing impeller. SPC mixing impellers assist in preventing the introduction of air into the coating and help to ensure a uniform mix.
b) Pour Part 'B' (Hardener) into Part 'A' (Base). The temperature of the coating components shall be above 15°C (59°F) to enhance mixing. Only Base and Hardener with the same colour coded dots (shown on the container lids), or identified as the same kit size, shall be mixed together. The kit sizes are also identified on the container lids. Refer to the Colour Chart in Appendix C.
c) Begin by mixing slowly. After the initial mix has been achieved, a spatula or mixing stick should be used to remove any raw resin from the side of the container.
d) Mix at a speed that ensures a uniform mix, but does not create a vortex in the liquid. Slow the mixer down at the surface of the liquid to prevent the introduction of air into the coating.
e) The ideal mixing and application temperature is between 20°C (68°F) and 30°C (86°F). Mix for one to two minutes blending both parts to create one uniform colour with no streaks.

f) Application may be done at this time by brushing or rolling. When coating pipe, do not remove the application instrument from the bottom of the pipe. Always remove an application instrument on the up-stroke to prevent pulling material down and off of the pipe bottom.

10.2 Spray Grade Application

The acceptable substrate temperature range for application of SP-8888® Spray Grade is 10°C (50°F) to 100°C (212°F). The substrate temperature shall be a minimum of 3°C (5°F) above the dew point temperature before proceeding with the coating operation.

For cold weather application and to achieve an adequate cure or accelerated cure, see Section 8.0.The coating shall not be allowed to freeze before an adequate cure is reached. An adequate cure is achieved when the Shore D hardness is ≥80. The appropriate preheat temperature and cure time can be determined from the SP-8888® Curing Table, Appendix D.

The recommended Spray Grade coating-preheat temperatures are as follows:

- Base: 70°C ± 5°C (158°F ± 9°F) to 80°C ± 5°C (176°F ± 9°F).
- Hardener: 20°C ± 5°C (68°F ± 9°F) to 30°C ± 5°C (86°F ± 9°F) (Ambient-typically not heated).
- In cases of extreme weather conditions the recommended temperatures may change,
  please consult your SPC representative.
- Preheating of the base material is required to balance the viscosity of the base and
  hardener.

SP-8888® Spray Grade shall be applied to the specified DFT in a single application using Graco Hydra-Cat, XP-70, XM, or Xtreme Mix high pressure heated plural component airless spray equipment or approved equivalent. WFT measurements should be continuously taken to ensure the minimum film thickness specified. In general, a WFT of 1.25 mm (50 mils) can be applied in a single application. If additional coats are required, they shall be applied while the preceding coat is still tacky. The maximum overcoating interval shall not exceed 120 minutes at 25°C (77°F) without roughening the surface. Blast roughening shall not be attempted until the coating has dried to a dry hard condition in accordance with the SP-8888® Curing Table Appendix D.

A minimum of 4 hours curing above 20°C (68°F) is required prior to handling. Handling time may be longer at lower temperatures.

See Appendices A and B for recommended equipment set-up.

10.3 Cartridge Application

The acceptable ambient temperature range for Cartridge coating application is -40˚C to 50˚C (-40°F to 122°F). The minimum surface temperature for coating is 10°C (50°F). The substrate temperature shall be a minimum of 3˚C (5˚F) above the dew point temperature.

For application of Cartridge coating, the surface shall be prepared as follows:

a) The surface shall be prepared in accordance with Section 7.0.
b) The adjacent coating shall be abraded for a minimum distance of 25 mm (1”) to ensure inter-coat adhesion. Ensure all gloss has been removed from the repair area.
c) The area to be coated shall be wiped with a clean cloth to remove dust. A dust respirator shall be worn for all sanding or grinding activities.
d) All surfaces to be coated shall be clean and completely dry prior to the application of the coating.

For cold weather application and to achieve an adequate cure or accelerated cure, see Section 8.0. The coating shall not be allowed to freeze before an adequate cure is reached.

The appropriate preheat temperature and cure time can be determined from the SP-8888® Curing Table, Appendix D.

The Cartridge coating shall be applied as follows:

a) Eject the required amount of coating material from the cartridge onto a clean tray using the manual dispenser.
b) Hand-mix the product with a stir stick until the coating colour becomes uniform with no streaks. Cartridge static mixers may be used.
c) Apply the coating to the required thickness on the area to be repaired using a spatula or paintbrush.
d) Extend the coating to at least 25 mm (1”) over the surrounding pre-roughened coating.

10.3.1 Accelerated Curing of Cartridge Coating

For coating repair using the Cartridge, a heat gun is typically used to preheat the area to be coated, or to rapidly cure the applied coating. This is suitable for small and medium sized patch repairs of 150 mm (6”) or less in diameter. It is not suitable for large repairs.

A stream of hot air produced by a hand-held heat gun is used to preheat the substrate prior to applying the coating and to postheat the patch after it has been applied. A Wagner, set at 1000°C (1832°F) is recommended. Other models may be used.

11.0 BRUSH GRADE COATING REPAIR

11.1 Repair of Pinholes and Holidays

Repair of pinholes and holidays 150 mm (6”) or less in diameter shall be accomplished by using SP-8888® Brush Grade or Cartridges. The procedure is as follows:

a) Surface preparation shall be in accordance with Section 7.0.
b) The adjacent coating shall be abraded for a minimum distance of 25 mm (1”) to ensure inter-coat adhesion. Ensure all gloss has been removed from the repair area.

c) The area to be coated shall be wiped with a clean cloth to remove dust. A dust respirator shall be worn for all sanding or grinding activities.
d) All surfaces to be coated shall be clean and completely dry prior to the application of the coating.
e) The minimum surface temperature for coating shall be 10°C (50°F). The substrate temperature shall be a minimum of 3°C (5°F) above the dew point temperature.
f) The area to be coated shall be preheated in cold temperature conditions. The appropriate preheat temperature and cure time can be determined from the SP-8888® Curing Table, Appendix D. The maximum preheat temperature shall not exceed 100°C (212°F).
g) For cold weather application and to achieve an adequate cure or accelerated cure, see Section 8.0. The coating shall not be allowed to freeze before an adequate cure is reached.
h) Postheating shall only be done using an induction coil or catalytic infrared heater.
i) Where Brush Grade kits are used, the coating shall be applied in accordance with Section 10.1.
j) Where Cartridges are used, the coating shall be applied in accordance with Section 10.3.

11.2 Repair of Large Areas

Areas larger than 150 mm (6”) in diameter shall be repaired using SP-8888® Brush Grade kits in accordance with Section 10.1.

12.0 SPRAY GRADE COATING REPAIR

12.1 Repair of Pinholes and Holidays

Repair of pinholes and holidays 150 mm (6”) or less in diameter shall be accomplished by using SP-8888® Brush Grade or Cartridges in accordance with Sections 10.1 and 10.3.

12.2 Repair of Large Areas

Areas larger than 150 mm (6”) in diameter shall be repaired using SP-8888® Brush Grade kits in accordance with Section 10.1.

13.0 RECOAT INTERVAL

The following temperatures for recoat windows refer to substrate temperatures:

Brush Grade

- 25°C (77°F) Maximum: 120 minutes
- 80°C (176°F) Maximum: 3 minutes

Spray Grade

- 25°C (77°F) Maximum: 120 minutes
- 80°C (176°F) Maximum: 2 minutes

14.0 BACKFILLING

Mechanical stress, including backfilling, shall not be applied to the coating until it has been adequately cured as defined in Section 2.0.

15.0 HANDLING PROPERTIES

	Brush Grade	Spray Grade
Pot Life [200 gm (7 oz) mass @ 25°C (77°F)]		15 minutes
Gel time [200 gm (7.0 oz) mass, Base 70°C (158°F), Hardener 25°C (77°F)]		1.5 minutes
Touch Dry Time	55 minutes	40 minutes
Dry Hard Time	3.5 hours	2.5 hours

Touch dry and dry hard times for Brush Grade at 0.60 mm (25 mils) coating thickness and substrate at 25°C (77°F). Touch dry and dry hard times for Spray Grade at 0.60 mm (25 mils) coating thickness, Base 70°C (158°F), Hardener 25°C (77°F) and substrate at 25°C (77°F).

16.0 MATERIALS

SP-8888® containers shall be sealed when not in use.

No amount of SP-8888® shall be given, sold or exchanged without express written permission from SPC.

The acceptable shipping and storage temperature range for SP-8888® is 5°C (41°F) to 50°C (122°F).

SP-8888® shall be stored in a cool, dry, well-ventilated area with the lids sealed.

The shelf life is a maximum of 24 months in unopened containers.

17.0 DISPOSAL

Once the coating materials have been used, any residual material left in the containers shall be “kicked over”. To do this the Contractor shall scrape out the unmixed resin material (base) from its container, and mix it with the matching product material (hardener) in the hardener container. The two components will react to produce a cured coating.

By mixing the hardener and resin materials, the resultant product will be rendered inert and not pose a hazard to the environment when disposed of under reasonable conditions and in accordance with applicable Federal, Provincial, and Municipal regulations in Canada, and Federal, State and County regulations in the United States of America.

All parties handling SPC materials shall refer to the applicable SDSs and follow the Preventative Measures and Safety Precautions referred to therein.

APPENDIX A

Graco Fixed Ratio Recommended Equipment Set-Up for Spraying SPC 100% Solids, Epoxy & Urethane Coatings

Coating Ratio:	3:1, 2:1 & 4:1
EQUIPMENT:	**DESCRIPTION**
Transfer pumps:	1 – 5:1 ratio transfer pump for B side 1 – 10:1 ratio transfer pump for A side
Solvent Flush Pump:	23:1 or greater
Proportioning Pump:	56:1 or greater
Displacement Pump For Hydra Cat:	**3:1** 2 – #222-012 displacement cylinder for A side 1 – #222-017 displacement cylinder for B side **4:1** 2 – #222-012 displacement cylinder for A side 1 – #222-019 displacement cylinder for B side **2:1** 2 – #222-012 displacement cylinder for A side 1 – #222-012 displacement cylinder for B side
Displacement Pump For XP:	**3:1** 1 – 145cc displacement cylinder for A side 1 – 48cc displacement cylinder for B side **4:1** 1 – 145cc displacement cylinder for A side 1 – 36cc displacement cylinder for B side **2:1** 1 – 115cc displacement cylinder for A side

1 – 58cc displacement cylinder for B side

Gauging:

2 – 0 to 500psi fluid gauges at the base and hardener inlets
3 – 0 to 10000psi fluid gauges at outlet manifold (Hydra Cat)
2 – 0 to 10000psi fluid gauges at outlet manifold (XP)
2 – 0 to 7500psi fluid gauges at the mix manifold

Heaters:

1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7A) installed in-line on the base side
1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7A) installed in-line on the hardener side (necessary for cold weather application)
1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7 A) installed in-line with the glycol hose bundle

Hose Bundle:

Base hose – 3/8" diameter wire braided (7250psi working pressure)
Hardener hose –1/4" diameter wire braided (7250psi working pressure)
Solvent hose –1/4" diameter wire braided (3000psi working pressure)
Glycol recirculation hose –1/4" or 3/8" ID
Husky 307 diaphragm pump with air regulator
Reservoir tank (1 Gallon)

NOTE:
Hardener, base & glycol lines to be wrapped with insulation and solvent line secured on the outside of the hose bundle. Connect Glycol lines to the Husky pump, reservoir tank and Viscon heater to form a loop.

Mix Manifold	Graco high volume mix manifold with 1/2” NPT fluid outlet and 3/8” NPT fluid inlets.
Whip Hose:	Whip hoses can vary in length from 10’ to 70’ depending on the SPC product that is being applied. The hose diameter can vary from 1/4” to 3/8” diameter wire-braided hoses with 7250psi working pressure. Please consult your SPC representative.
Static Mixers:	1 – Stainless steel or Teflon coated spiral pipe mixer and housing (3/8” ID x 9.5” long) positioned between the mix manifold and whip hose 1 – Stainless steel or Teflon coated spiral pipe mixer and housing (3/8” ID x 9.5” long) positioned between the two whip hoses
Spray Guns:	Graco Silver, Silver Plus or XTR series
Spray Tips:	Graco reversible tips: .019” - .031”
Drum Heaters:	Suitable drum heaters (steel or silicone) are required on the base drum and may be required on the hardener drum (dependent on ambient temperature) in order to achieve suitable viscosity to facilitate proper mixing, atomization and ratio. Also, a water bath may be used to heat the product in a drum.

APPENDIX B

Graco Variable Ratio Recommended Equipment Set-Up for Spraying SPC 100% Solids, Epoxy & Urethane Coatings

COATING RATIO:	**3:1, 2:1 & 4:1**
EQUIPMENT	**DESCRIPTION**
Transfer Pumps:	1 – 5:1 ratio transfer pump for the B side 1 – 10:1 ratio transfer pump for the A side
Solvent Flush Pump:	1 – 23:1 or greater
Proportioning Pump:	1 – 56:1 or greater
Displacement Pump For Xtreme Mix:	1 –180cc displacement cylinder for A side 1 –180cc displacement cylinder for B side
Displacement Pump For XM:	1 –180cc displacement cylinder for A side 1 –145cc displacement cylinder for B side
Gauging:	2 – 0 to 500psi fluid gauges at the base and hardener inlets 2 – 0 to 7500psi fluid gauges at the base and hardener inlets on the mix manifold
Heaters:	1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7 A) installed in-line on the base side 1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7 A) installed in-line on the hardener side (necessary for cold weather application) 1 – Viscon high pressure fluid heater (240 V, 4000 W & 16.7 A) installed in-line with the glycol hose bundle

Hose Bundle:	1 – Base hose –3/8” diameter wire braided (7250psi working pressure) 1 – Hardener hose – 1/4” diameter wire braided (7250psi working pressure) 1 – Solvent hose – 1/4”diameter wire braided (3000psi working pressure) 1 – Husky diaphragm pump with air regulator

NOTE:
Hardener, base & glycol line to be wrapped with insulation and solvent line secured on the outside of the hose bundle. Connect glycol lines to the Husky pump, reservoir tank and Viscon heater to form a loop.

Mix Manifold:	Graco high volume mix manifold
Whip Hose:	Whip hoses can vary in length from 10’ to 70’ depending on the SPC product that is being applied. The hose diameter can vary from 1/4” – 3/8” diameter wire braided hoses with 7250psi working pressure. Please consult your SPC representative.
Static Mixers:	1 – Stainless steel or Teflon coated spiral pipe mixer and housing (3/8” ID x 9.5” long) positioned between the mix manifold and whip hose. 1 – Stainless steel or Teflon coated spiral pipe mixer and housing (3/8” ID x 9.5” long) positioned between the two whip hoses.
Spray Guns:	Graco Silver, Silver Plus or XTR Series
Spray Tips:	Graco reversible tips: .019” – .031”
Drum Heaters:	Suitable drum heaters (steel or silicone) are required on the Base drum and may be required on the Hardener drum (dependent on ambient temperature) in order to achieve suitable viscosity to facilitate proper mixing, atomization and ratio.

APPENDIX C

Kit Size Colour Chart

BRUSH GRADE COATING KITS COLOUR CHART Match Base & Hardener Based on Colour Coded Dots Below. Mixing Ratio By Volume: 3 Parts Base to 1 Part Hardener.			
SIZE	**COLOUR**	**VOLUME**	
		BASE	**HARDENER**
0.50 Litres	PINK	0.3750 Litres	0.1250 Litres
0.75 Litres	FL GREEN	0.5625 Litres	0.1875 Litres
0.90 Litres	FL YELLOW	0.6750 Litres	0.2250 Litres
1.00 Litres	RED	0.7500 Litres	0.2500 Litres
1.25 Litres	PURPLE	0.9375 Litres	0.3125 Litres
1.50 Litres	YELLOW	1.1250 Litres	0.3750 Litres
1.75 Litres	ORANGE	1.3125 Litres	0.4375 Litres
2.00 Litres	BLACK	1.5000 Litres	0.5000 Litres
2.25 Litres	BLUE	1.6875 Litres	0.5625 Litres
2.50 Litres	GREEN	1.8750 Litres	0.6250 Litres
2.75 Litres	WHITE	2.0600 Litres	0.6900 Litres
	Note: FL = Fluorescent		

APPENDIX D

SP-8888® Curing Table

SUBSTRATE TEMPERATURE	DRY HARD CURING TIME	
	Brush Grade	**Spray Grade**
90ºC (194ºF)	2.5 Minutes	1.6 Minutes
80ºC (176ºF)	3 Minutes	2 Minutes
70ºC (158ºF)	5 Minutes	3 Minutes
60ºC (140ºF)	9 Minutes	9 Minutes
50ºC (122ºF	37 Minutes	16 Minutes
40ºC (104ºF)	1 Hour 20 Minutes	38 Minutes
30ºC (86ºF)	1 Hour 45 Minutes	1 Hour 40 Minutes
25ºC (77ºF)	3 Hours 30 Minutes	2 Hours 30 Minutes
20ºC (68ºF)	5 Hours 40 Minutes	4 Hours 50 Minutes
10ºC (50ºF)	16 Hours	14 Hours

Substrate: 12 mm (0.5 in.) Thick Steel Panels

Brush Grade Material Temperature: Base and Hardener: 25°C (77°F)

Spray Grade Material Temperature: Base: 70ºC (158ºF)

Hardener: 25ºC (77ºF)

Dry Film Thickness: 0.50 mm (20 mils) DFT as per ASTM D1640

Note: The information above is to serve as a guide only. The test results were compiled under laboratory-controlled conditions. Field results may vary due to variable conditions such as radiant heat loss and the cooling effects of wind.