



# SPECIALTY POLYMER COATINGS, INC.




## MANUFACTURER'S QUALIFIED APPLICATION PROCEDURE

FOR SP-2831<sup>®</sup>

BRUSH GRADE & SPRAY GRADE

MQAP IDENTIFIER – SP-2831 R.0

### DOCUMENT REVISION HISTORY

REV.	DATED	DESCRIPTION	PREPARED BY	REVIEWED BY	APPROVED BY	CLIENT ACCEPTED BY
0	Sept., 8. 2015					



## TABLE OF CONTENTS

<b>1.0 SCOPE .....</b>	<b>3</b>
<b>2.0 STANDARDS AND SPECIFICATIONS .....</b>	<b>3</b>
<b>3.0 DEFINITIONS .....</b>	<b>4</b>
<b>4.0 GENERAL .....</b>	<b>5</b>
<b>5.0 COMPATIBILITY WITH OTHER ANTI-CORROSION COATINGS.....</b>	<b>5</b>
<b>6.0 PACKAGING .....</b>	<b>5</b>
<b>7.0 RECOMMENDED FILM THICKNESS.....</b>	<b>5</b>
<b>8.0 SAFETY CONSIDERATIONS .....</b>	<b>5</b>
<b>9.0 CERTIFICATION .....</b>	<b>7</b>
<b>10.0 SURFACE PREPARATION.....</b>	<b>7</b>
<b>11.0 PREHEATING .....</b>	<b>8</b>
<b>12.0 EQUIPMENT .....</b>	<b>9</b>
<b>13.0 COATING APPLICATION .....</b>	<b>9</b>
13.1 BRUSH GRADE APPLICATION .....	9
13.1.1 MIXING INSTRUCTIONS- BRUSH GRADE COATING.....	10
13.2 SPRAY GRADE APPLICATION.....	10
<b>14.0 BRUSH GRADE COATING REPAIR.....</b>	<b>11</b>
14.1 REPAIR OF PINHOLES AND HOLIDAYS AND LARGE AREAS.....	11
<b>15.0 SPRAY GRADE COATING REPAIR .....</b>	<b>12</b>
15.1 REPAIR OF PINHOLES, HOLIDAYS, AND LARGE AREAS .....	12
<b>16.0 RECOAT INTERVAL.....</b>	<b>12</b>
<b>17.0 BACKFILLING.....</b>	<b>13</b>
<b>18.0 HANDLING PROPERTIES.....</b>	<b>13</b>
<b>19.0 INSPECTION .....</b>	<b>13</b>
<b>20.0 MATERIALS .....</b>	<b>14</b>
<b>21.0 DISPOSAL.....</b>	<b>14</b>
<b>APPENDIX A.....</b>	<b>15</b>
<b>APPENDIX B.....</b>	<b>17</b>
<b>APPENDIX C.....</b>	<b>19</b>
<b>APPENDIX D.....</b>	<b>20</b>



## INTRODUCTION

SP- 2831<sup>®</sup> is a 100% solids two-component epoxy coating developed specifically for use on facilities operating at low temperatures and for cool weather applications. SP- 2831<sup>®</sup> is used for below ground corrosion control on pipe, piping assemblies, valve assemblies, pipe components, girth welds, coating repair, and in-situ rehabilitation of existing pipelines.

SP- 2831<sup>®</sup> is available in Spray Grade and Brush Grade.

This Manufacturer's Qualified Application Procedure (MQAP) describes the requirements for the application and inspection of SP-2831<sup>®</sup>.

### 1.0 SCOPE

This MQAP applies to SP-2831<sup>®</sup> application where pipeline service temperatures do not exceed 65°C (149°F).

### 2.0 STANDARDS AND SPECIFICATIONS

- a) SSPC Painting Manual – Volume II.
- b) SSPC VIS 1 Visual Standard for Abrasive Blast Cleaned Steel.
- c) SSPC Guide 15 Filed Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates.
- d) Swedish Standards Institution (SIS) 05590 Pictorial Surface Preparation Standards for Painting Steel Surfaces.
- e) NACE Recommended Practices / SSPC Standards – Surface Preparation:
  - NACE No.1/SSPC-SP-5.
  - NACE No.2/SSPC-SP-10.
  - SSPC-SP-11.
- f) SSPC-PA Guide 10 - A Guide to Safety and Health Requirements.
- g) ISO 8502 Preparation of Steel Substrates before Application of Paint and Related Products.
  - Tests for the Assessment of Surface Cleanliness:
    - Part 3: Assessment of Dust on Steel Surfaces Prepared for Painting (Pressure-Sensitive Tape Method).
    - Part 5: Measurement of Chloride on Steel Surfaces Prepared for Painting (Ion Detection Tube Method).



### 3.0 DEFINITIONS

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

**Adequate Cure** - where preheating is used in cold weather application or to accelerate a cure, adequate cure shall be achieved for Shore D hardness  $\geq 80$  measured at  $21^{\circ}\text{C} \pm 2^{\circ}\text{C}$ . For the purpose of handling the coated surface (lowering in or backfilling), adequate cure for temperatures above  $15^{\circ}\text{C}$  is achieved when the coating is dry hard.

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

**Touch dry time** - coating does not adhere to a fingertip when lightly touched.

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

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

**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.

**Epoxy** - a two-component liquid epoxy or epoxy/urethane coating system.

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

**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  $3^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ) above the dew point of the air immediately adjacent to the surface.

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



#### **4.0 GENERAL**

SP-2831<sup>®</sup> is manufactured by Specialty Polymer Coatings, Inc. (SPC) in Langley, BC, and in Brantford, ON.

Langley address:

#101 - 20529 - 62nd Avenue, Langley, BC  
Canada, V3A 8R4  
Telephone: 604-514-9711  
Fax: 604-514-9722

Brantford address:

48 Bury Court, Brantford, ON  
Canada, N3S 0B1  
Telephone: 519-757-0311  
Fax: 519-757-0312

The contractor shall be responsible for complying with all of the requirements of this specification.

#### **5.0 COMPATIBILITY WITH OTHER ANTI-CORROSION COATINGS**

SP-2831<sup>®</sup> is compatible with all SPC and fusion bonded epoxy (FBE) anti-corrosion coatings. For compatibility with other anti-corrosion coatings, please consult with SPC.

#### **6.0 PACKAGING**

##### **Brush Grade Material**

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

#### **7.0 RECOMMENDED FILM THICKNESS**

For standard corrosion protection, a DFT of 0.50 mm minimum (20 mils), is recommended.

#### **8.0 SAFETY CONSIDERATIONS**

SP-2831<sup>®</sup> 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 case 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.



## **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.

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 maintain good personal hygiene and wash thoroughly after exposure to the coating.

## **9.0 CERTIFICATION**

The contractor shall be certified by the manufacturer. Only those contractors or subcontractors who hold current approval by the manufacturer shall apply SP-2831<sup>®</sup>. Contractors or subcontractors who have taken SPC's 'Train the Trainer' Program and have written confirmation of this, are eligible to train their personnel. Certification of personnel shall be the responsibility of the contractor and shall be at least once every two calendar years.

## **10.0 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 bare pipe for surface contaminants. Any oil, grease or magnetic particle inspection products or ultrasonic couplant shall be removed in accordance with SSPC-SP-1 using acetone, xylene or MEK. The pipe shall be heated to remove any moisture. The pipe's 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 50°C (122°F) or the owner's maximum preheat temperature.

All surfaces to be coated shall be abrasive blasted to SSPC SP-10/NACE No. 2 (Near White)/Sa 2½ 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, and a maximum of 125 microns (5.0 mils) peak to valley. Target Green Diamond, Target Black Magic, Starblast XL, Black Beauty, Barshot, Black Lightning or an owner approved equivalent shall be used.



The underside and narrow edges of all angles, weld beads and structural members shall be blast cleaned to the SSPC SP-10/NACE No. 2 (Near White)/Sa 2½ cleanliness. All surfaces shall be cleaned of all loose blasting products.

All surfaces to be coated shall be completely dry, free of moisture, soil, dust and abrasive material at the time the coating is applied.

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-2831® shall be feathered down to the steel substrate after the coating has cured.

All blasting onto existing SP-2831® 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 fusion bonded epoxy (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 be initiated 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.

Wetting of the ground in the vicinity of the coating operation may be necessary to prevent surface contamination of the area to be coated.

## **11.0 PREHEATING**

The surface temperature of the substrate shall be maintained in the range recommended in this document from abrasive blasting through coating cure. Preheating may be required. Preheating may





also be used to accelerate cure when there are time or weather constraints. 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  $\geq 80$ .

Preheating of the pipe shall be performed in an enclosure or indoors using a manufacture approved method when substrate temperatures are below  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) The minimum surface temperature of  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) shall be maintained until the coating has achieved adequate cure.

Neither handling nor backfilling shall be permitted until the coating has achieved an adequate cure, as determined by the owner's inspector. Cure may be accelerated by post heating. Post heating shall be performed in an enclosure or indoors using manufacturer approved method. The post heat temperature of the coating surface shall not exceed  $50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ) as measured by infrared non-contact pyrometer.

## **12.0 EQUIPMENT**

Disposable tools, such as brushes or short nap mohair rollers (available from SPC), should be used to apply SP-2831<sup>®</sup>.

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-2831<sup>®</sup> Spray Grade coating systems in accordance with SPC's recommendations and specifications. See Appendices A and B.

## **13.0 COATING APPLICATION**

### **13.1 Brush Grade Application**

A DFT  $>0.5\text{mm}$  (20 mils) can be applied to a vertical surface in a single application. Higher builds are possible on horizontal surfaces.

SP-2831<sup>®</sup> Brush Grade shall be applied to clean, dry surfaces only. Condensation, precipitation, water vapour or any other forms of contamination are not acceptable on the blasted surface prior to coating. Surfaces subject to any of these conditions shall be blast cleaned to return the surface to SSPC SP-10/NACE No. 2 (Near White)/Sa  $2\frac{1}{2}$  cleanliness in accordance with Section 10.0.

The acceptable ambient temperature range for brush grade application is  $-40^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $-40^{\circ}$  to  $122^{\circ}\text{F}$ ). The acceptable substrate temperature range for application of SP-2831<sup>®</sup> Brush Grade is  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) to  $50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ). Care must be taken at  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) as ice crystals may be present in the surface pores of the steel substrate. The substrate temperature shall be a minimum of  $3^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ) above the dew point temperature before proceeding with coating application.

Coating application may be performed when the pipe temperature is below  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) by the use of a heated enclosure for pre and post heating. 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  $\geq 80$ .



The appropriate temperature and cure time can be determined from the SP-2831<sup>®</sup> Curing Table, Appendix D. The maximum temperature shall not exceed 50°C (122°F).

SP-2831<sup>®</sup> Brush Grade cures to a dry-hard condition in 18 hours at 0°C (32°F).

SP-2831<sup>®</sup> Brush Grade shall not be overcoated unless the coating has cured to a dry-hard condition. Before applying a second coat, the surface shall be blast roughened. Blast roughening should not be attempted until the coating has dried to a dry-hard condition in accordance with the SP-2831<sup>ⓧ</sup> (Appendix “D”).

### 13.1.1 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. Mix for two (2) minutes if Base and Hardener are at temperatures between 15°C (59°F) and 20°C (68°F). If Base is at a temperature between 20°C (68°F) and 35°C (95°F), mix for thirty (30) seconds to one (1) minute. 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 and one solid color, 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) 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.

### 13.2 Spray Grade Application

SP-2831<sup>®</sup> Spray Grade shall be applied to clean, dry surfaces only. Condensation, precipitation, or any other forms of contamination are not acceptable on the blasted surface prior to coating. Surfaces subject to any of these conditions shall be blast cleaned to return the surface to SSPC SP-10/NACE No. 2 (Near White)/Sa 2½ cleanliness in accordance with Section 10.0.

The acceptable ambient temperature range for spray grade application is -40°C to 50°C (-40° to 122° F). The acceptable substrate temperature range for application of SP-2831<sup>®</sup> Spray Grade is 0°C (32°F) to 50°C (122°F). Care must be taken at 0°C (32°F) as ice crystals may be present in the surface pores of the steel substrate. The substrate temperature shall be a minimum of 3°C (5°F) above the dew point temperature before proceeding with the coating operation.

Coating application may be performed in cold temperature conditions when the pipe temperature is below 0°C (32°F) by the use of a heated enclosure for pre and post heating. 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  $\geq 80$ .

The appropriate temperature and cure time can be determined from the SP-2831<sup>®</sup> Curing Table, Appendix D. The maximum temperature shall not exceed 50°C (122°F).

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

- Base: 55°C (131°F) to 65°C (149°F).
- Hardener: 15°C (59°F) to 30°C (86°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.

In cases of extreme weather conditions, the recommended temperatures may change. Consult a SPC representative.

SP-2831<sup>®</sup> Spray Grade shall be applied to the specified DFT in a single application using Graco Hydra-Cat, XP-70, XM, or Extreme 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 0.5mm (20 mils) can be applied in a single application. SP-2831<sup>®</sup> Spray Grade shall not be overcoated unless the coating has cured to a dry hard condition. Before applying a second coat, the surface shall be blast roughened. Blast roughening should not be attempted until the coating has dried to a dry-hard condition (Shore D hardness of  $>80$ ) in accordance with the SP-2831<sup>®</sup> (Appendix "D").

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

## **14.0 BRUSH GRADE COATING REPAIR**

### **14.1 Repair of Pinholes and Holidays and Large areas**

Repair of pinholes and holidays and large areas shall be accomplished by using SP-2831<sup>®</sup> Brush Grade in accordance with Section 13.1. The procedure is as follows:

- a) Repair areas shall be roughened using carborundum cloth, sandpaper, or MBX<sup>®</sup> Bristle Blaster<sup>®</sup> or grit blasting.
- b) The adjacent coating shall be abraded for a minimum distance of 25 mm (1") to ensure inter-coat adhesion.



- 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 0°C (32°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-2831® Brush Grade Curing Table, Appendix D. The maximum preheat temperature shall not exceed 50°C (122°F).
  
- g) For some applications, post-heating may be required to achieve an adequate cure depending upon ambient temperature, pipe wall thickness, and other variables. The coating must not be allowed to freeze before an adequate cure is reached. Preheating and postheating may also be utilized if an accelerated cure time is required.
- h) Preheating shall be accomplished by either flame heating the surface with a propane torch prior to blasting, or by the use of an induction coil or catalytic infrared heater subsequent to blasting and prior to coating. Postheating shall only be done using an induction coil or catalytic infrared heater.

## **15.0 SPRAY GRADE COATING REPAIR**

### **15.1 Repair of Pinholes, Holidays, and Large Areas**

Repair of pinholes and holiday shall be accomplished by using SP-2831® Brush Grade in accordance with Sections 13.1. Repair of large areas shall be accomplished by using SP-2831® Brush Grade or Spray Grade in accordance with Sections 13.1, and 13.2 respectively.

## **16.0 RECOAT INTERVAL**

The following temperatures for recoat windows refer to substrate temperatures:

### **Spray Grade**

- 0°C (32° F) Maximum: 2 Hours
- 10°C (50 °F) Maximum: 1 Hour

### **Brush Grade**

- 0°C (32°F) Maximum: 3 Hours
- 10°C (50°F) Maximum: 1 Hour

Sweep blasting of the surface is required if the maximum re-coat interval is exceeded.

Small areas 930 sq. cm. (144 sq. in.) may be sanded using a medium grit (80-100) carborundum cloth. All dust from the sanding or blast roughening shall be removed from the surface prior to the application of the coating.



## 17.0 BACKFILLING

Mechanical stress, including backfilling, shall not be applied to the coating until it has been adequately cured as defined in Section 3.0.

## 18.0 HANDLING PROPERTIES

	<b>Brush Grade</b>	<b>Spray Grade</b>
Pot Life [100 gm (3.5 oz) mass @ 25°C (77° F)]	100 minutes	
Gel time [200 gm (7.0 oz) mass, Base 60°C (140° F), Hardener 25°C (77° F)]		4 min 45 sec
Touch Dry Time	1 hour	50 minutes
Dry Hard Time	3.5 hours	3 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 60°C (140° F), Hardener 25°C (77° F) and substrate at 25°C (77°F).

## 19.0 INSPECTION

The owner's appointed representative has the option to inspect the quality of all blasted surfaces prior to the application of SP-2831<sup>Ⓢ</sup>. Acceptance shall be given by said representative to the owner and contractor's representative.

During coating application, WFT measurements should be continuously taken to ensure the minimum film thickness specified. WFT measurements should be taken using SPC approved WFT gauges. When pipe has been preheated, accurate WFT measurements may be difficult for a fast curing coating.

After the SP-2831<sup>Ⓢ</sup> has cured to a dry-hard condition, the owner's representative and / or contractor's inspector shall measure the DFT with an approved, calibrated, magnetic gauge and / or electronic DFT gauge. The appointed inspector shall notify the applicator of his acceptance. Notification to the applicator of all inadequately coated sections should be made immediately.

Holiday testing of the finished coating film may be performed to ensure adequate corrosion protection. Inspection with a holiday detector shall not be attempted until the coating is hard dry (hard dry as determined when the coating does not indent when pressed with a thumbnail).



The maximum voltage used for this testing shall not exceed 125 volts per 25 microns (1.0 mil). The holiday testing of SP-2831<sup>®</sup> coating shall be carried out in accordance with NACE SP 0188.

Notification of all defects shall be made within a reasonable time frame from completion of the work to allow for all repairs within the allotted time frame for the project.

Where preheating is required to achieve an adequate cure, the contractor shall ensure that the coating has reached a Shore D hardness of 80 or greater.

In cold weather applications, the Shore D hardness shall be measured when the coating has cooled to 21°C ± 2°C. Additionally, the Shore D hardness shall be measured in accordance with ASTM D 2240-05. As a minimum of 3 mm (120 mils) is required for an accurate Shore D measurement, the manufacturer recommends that a thumbnail size area of coating be applied to this thickness during application of the coating. The manufacturer recommends that the Shore D hardness be measured on the first area coated and as a minimum, each hour thereafter of coating application.

## **20.0 MATERIALS**

SP-2831<sup>®</sup> containers shall be sealed when not in use.

No amount of SP-2831<sup>®</sup> shall be given, sold or exchanged without express written permission from SPC.

The acceptable shipping and storage temperature range for SP-2831<sup>®</sup> is 5°C (41°F) to 50°C (122°F).

SP-2831<sup>®</sup> 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.

## **21.0 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.

Please note that all parties handling SPC materials should 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**

<b>Coating Ratio:</b>	3:1, 2:1 & 4:1
<b>EQUIPMENT:</b>	<b>DESCRIPTION</b>
<b>Transfer pumps:</b>	1 – 5:1 ratio transfer pump for B side 1 – 10:1 ratio transfer pump for A side
<b>Solvent Flush Pump:</b>	23:1 or greater
<b>Proportioning Pump:</b>	56:1 or greater
<b>Displacement Pump For Hydra Cat:</b>	<b>3:1</b> 2 – #222-012 displacement cylinder for A side 1 – #222-017 displacement cylinder for B side <b>4:1</b> 2 – #222-012 displacement cylinder for A side 1 – #222-019 displacement cylinder for B side <b>2:1</b> 2 – #222-012 displacement cylinder for A side 1 – #222-012 displacement cylinder for B side
<b>Displacement Pump For XP:</b>	<b>3:1</b> 1 – 145cc displacement cylinder for A side 1 – 48cc displacement cylinder for B side <b>4:1</b> 1 – 145cc displacement cylinder for A side 1 – 36cc displacement cylinder for B side <b>2:1</b> 1 – 115cc displacement cylinder for A side 1 – 58cc displacement cylinder for B side
<b>Gauging:</b>	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			
<u>COLOUR CHART</u>			
Match Base & Hardener Based on Colour Coded Dots Below. Mixing Ratio By Volume: 3 Parts Base to 1 Part Hardener.			
<u>SIZE</u>	<u>COLOUR</u>	<u>VOLUME</u>	
		<u>BASE</u>	<u>HARDENER</u>
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-2831® Curing Table**

<b>SUBSTRATE TEMPERATURE</b>	<b>DRY HARD CURING TIME</b>	
	<b>Brush Grade</b>	<b>Spray Grade</b>
50°C (122°F)	40 Minutes	35 Minutes
25°C (77°F)	3 Hours	3.5 Hours
20°C (68°F)	4.5 Hours	4 Hours
15°C (59°F)	5.5 Hours	5 Hours
10°C (50°F)	8 Hours	7 Hours
5°C (41°F)	10 Hours	8 Hours
0°C (32°F)	18 Hours	16 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: 60°C (140°F)  
Hardener: 25°C (95°F)

Dry Film Thickness: .63 mm (25 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.