Protal 7200 / 7900HT Air Cartridge Gun (1000 ml)

Recommended Application Procedures

For Projects up to 500 sqft

Step 1

Surface Preparation

Prepare the surface by removing all loose scale, rust or any other foreign matter in accordance with SSPC SP-10 “Abrasive Blasting”. Refer to the Protal Application Specification Guide for additional information.

All personnel shall be trained by a Denso representative prior to application of Protal 7200 / 7900HT air cartridges.

Step 2

Attach Air Supply

Attach the air supply hose to the air gun. Minimum 14 CFM air compressor is required. The air supply pressure should be 90 - 110psi (0.6 - 0.7 MPa).

Note: *Air must be well conditioned to remove moisture from the air stream.*

Step 3

Regulate Air Pressure

Adjust the atomizing air pressure dial to #4 to #5. This may vary depending on the product temperature.

Note: *Yellow markings are to highlight specific areas and do not appear on the actual gun.*

Note: *When spraying with a right angle tip, it may require an increase in air pressure.*

Step 4

Adjust Fluid Pressure

Adjust the fluid pressure dial to #2 to #3 by scrolling up on the side wheel shaped dial, near the trigger. This may vary depending on the product temperature.

Note: *Yellow markings are to highlight specific areas and do not appear on the actual gun.*

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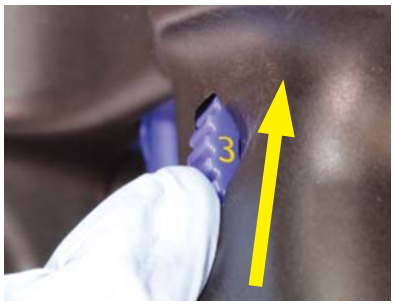

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Protal 7200 / 7900HT Air Cartridge Gun (1000 ml)
Recommended Application Procedures

Step 5

Heat Cartridge

Using a 1000 watt microwave with a turntable, heat the cartridge to 120˚F (49˚C) to 130˚F (54˚C). Flip cartridge half way through the heating process to maintain an even temperature throughout the cartridge. Verify temperature with an infrared temp-gun by checking the Part A (Larger tube) at multiple locations.

Note: *1 minute will heat the cartridge approximately 20˚F (-6 ˚C).*

Step 6

Shake Cartridge

Cartridge shall be shaken by one of the two following methods:

Preferred Method - Clamp cartridge in paint shaker, with end cap up, and shake for approximately 30 seconds.

Alternate Method - By hand, shake cartridge well, with the end cap facing up, for approximately 30 seconds.

After shaking the cartridge, recheck the temperature of the "Part A" (Large tube) to verify it has reached 130˚F (54˚C) to 140˚F (60 ˚C).

Step 7

Attach Mixing Tip

Remove cartridge end cap by unscrewing and pulling up. Push the static mixing tip over the cartridge outlet, ensuring the 2 legs are properly seated and screw the nozzle cap to tighten and lock in place before installing into the gun.

Step 8

Insert Cartridge & Attach Air Hose

Hold the air cartridge gun in an upright position (away from yourself and others) before installing the cartridge. Insert the cartridge, making sure it fits securely by snapping it into place. Connect the "quick lock adapter" on the air hose firmly onto the static mixing tip.

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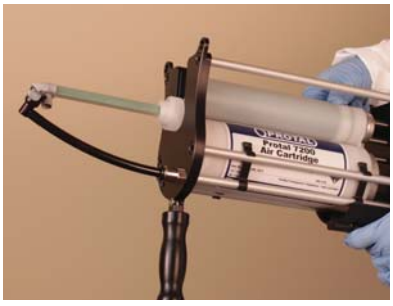

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Recommended Application Procedures

Step 9

Purge cartridge and mixing tip by first pulling the trigger half-way, just long enough to fill the static mixing tip with material. Continue purging away from the substrate by pulling trigger back completely. Purge for a few seconds until one uniform color is achieved.

Purge Cartridge

Step 10

Without stopping, begin spray application. Prior to stopping, move away from the substrate and then release the trigger.

Note: *Any time the spray application is stopped, the cartridge shall be purged prior to beginning the next application.*

Note: *It is recommended to stop spraying with approximately ½" (12.5 mm) material in the cartridge to eliminate potentially unmixed product.*

Spray Cartridge

Step 11

Press the red button to retract the ejector plates from the cartridge. Disconnect quick lock coupling on air hose from mixing tip air inlet. Partially-used cartridges may be reused by removing and discarding the mixing tip, wipe clean and resealing the cartridge with the original plug and nut assembly. Be sure to re-align the plug according to the A and B compounds.

Note: *Refer to the Protal 7200 SDS (Parts A and B) and applicable regulations or authorities for waste disposal.*

Remove Cartridge From Gun

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Protal 7200
Brush Application Specifications

1.0 Scope

1.1 This specification covers the external surface preparation and coating of pipeline applications such as weld joints, special pipe sections, fittings and fabrication.

2.0 Material and Storage

2.1 Material shall be Denso Protal 7200 coating system as manufactured by Denso North America, 9747 Whithorn Drive, Houston, TX 77095 (Tel) 281-821-3355 (Fax) 281-821-0304 or 90 Ironside Crescent Unit 12, Toronto, Ontario, Canada M1X1M3 (Tel) 416-291-3435 (Fax) 416-291-0898. E-mail: info@densona.com.

2.2 Material shall meet the physical properties of the attached product data sheet.

2.3 Storage: Material shall be stored in a warm, dry place between 40°F (4°C) to 105°F (41°C). Care shall be taken to insure the material is stored up right (arrows on boxes facing up). *Note: If the material is kept cold, it will become very viscous. Do not allow material to freeze.*

3.0 Equipment

3.1 For mixing, use strong wooden stir sticks or power drills with appropiate mixing paddle.

3.2 For application, use 4" (100 mm) wide brushes, Denso applicator pads or Protal 9" (225 mm) roller.

3.3 Wet film thickness gauges.

4.0 Surface Preparation

4.1 All contaminants shall be removed from the steel surface to be coated. Oil and grease should be removed in accordance with SSPC SP-1 using non-oily solvent cleaner (i.e., xylene, MEK, ethanol, etc.).

4.2 Material for abrasive cleaning shall be the appropriate blend of grit to produce an angular surface profile of 2.5 - 5 mils (0.063 - 0.125 mm).

4.3 All surfaces to be coated shall be grit blasted to a near-white finish (SSPC SP-10, NACE No. 2 or Sa 2 1/2). *Note: Near-white finish is interpreted to mean that all metal surfaces shall be blast cleaned to remove all dirt, mill scale, rust, corrosion products, oxides, paint and other foreign matter. Very light shadow, very light streaks or slight discolorations shall be acceptable; however, at least 95% of the surface shall have the uniform gray appearance of a white metal blast-cleaned surface as defined by Swedish Pictorial Surface Preparation Standard Sa 2 1/2 or SSPC VIS-1. In some instances where abrasive blasting is not permissible, the surface can be prepared to a near-white finish using SSPC SP-11. The key with this method is achieving the near white finish with a minimum 2.5 mil anchor profile. After cleaning, blow dry and/or wipe clean with an isopropyl alcohol, xylene or MEK soaked lint-free cloth.*

4.4 Edges of the existing coating shall be roughened by power brushing or by sweep blasting the coating for a distance of 1" (25 mm) minimum.

4.5 The Contractor shall check the surface profile depth by using a suitable surface profile gauge (Press-O-Film Gauge or equal).

4.6 Metal areas that develop flash rust due to exposure to rain or moisture shall be given a sweep blast to return them to their originally blasted condition.

5.0 Application

5.1 The surface shall have no condensation, precipitation or any other forms of contamination on the blasted surface prior to coating.

5.2 The substrate temperature range for application of Protal is 50°F (10°C) to 212°F (100°C). The substrate temperature must be a minimum of 5°F (3°C) above the dew point temperature before proceeding with the coating operation. Ambient temperature may be lower than 50°F (10°C) if the substrate is heated. Preheating may be accomplished with a propane torch or induction coil prior to abrasive blasting.

5.3 Protal shall be applied to the specified Dry Film Thickness (DFT) using a brush, Denso applicator pad or roller. Wet film measurements shall be performed to ensure close adherence to the thickness specification.

5.4 Mixing: Make sure the part A (Resin) and Part B (Hardener) components match in both material and size as specified on the containers. Mix the B component first, independent of the resin. Pour the contents into the part A (Resin) component. Mix at a slow speed so as not to create a vortex that could introduce air into the product until a uniform color is achieved making sure to scrape the bottom and sides of the container (approximately 2 minutes). No streaks shall be visible.

5.5 APPLICATION SHALL TAKE PLACE IMMEDIATELY AFTER MIXING. Apply the product onto the surface and spread down and around the surface in bands beginning from the leading edge of the material to as far under the pipe as can be reached. Overlap the bands and onto the existing coating a minimum of 1" (25 mm). Applicators shall use a brush to smooth out any obvious sags or rough edges, valleys, or drips. Special attention shall be given to weld buttons and bottom surfaces.

5.6 The thickness of Protal shall be checked periodically by wet film gauge to achieve the minimum and maximum wet film thickness specified. After the Protal has cured, the owner's representative and/or contractor's inspector should measure the film thickness by magnetic gauge and notify the applicator of their acceptance. Notification to the applicator of any inadequately coated sections must be made immediately.

5.7 Over-coating, when necessary, shall take place within 2 hours at 80°F (27°C). If recoat window has lapsed, the surface shall be roughed prior to application of the topcoat using 80 grit sand paper or by sweep blasting.

6.0 Inspection/Testing for Backfill

6.1 The finished coating shall be smooth and free of runs, sags and/or holidays. All surfaces shall have the required minimum/maximum DFT. In general, the surface of the coating shall be no rougher than the base or substrate material.

6.2 After the Protal has cured to a hard cure condition, the owner's representative and/or contractor's inspector should measure the film thickness by magnetic gauge and notify the applicator of their acceptance.

6.3 For most applications, backfill can be accomplished when the coating reaches a Shore D of 70. The "thumb nail test" can also be used. The thumb nail test is defined by when one can no longer make a permanent indention in the coating using one's thumb nail.

6.4 An acceptable field test to check to see if the coating has a full chemical cure, a solvent such as Xylene, MEK or Toluene can be rubbed on to the coating. If the gloss/sheen is removed the coating is not fully cured.

6.5 Holiday detection shall be performed on all coated areas. Detection voltage should be based on specified nominal pipe coating thickness and calculated in accordance with the NACE SPO188 Standard.

6.6 Denso and/or the owner's representative immediately upon completion of the work shall make final inspection of the completed application. Notification of all defects must be made within a reasonable time frame from completion of the work to allow for all repairs within the allowed time frame for the project.

6.7 Recoating: If a second coat is required and passes the cure test as described in section 6.3, the surfaces shall be roughened by sweep blasting. If the coating is soft, no surface preparation is required.

7.0 Repairs

7.1 Pinhole repairs may be repaired by using Protal Repair Cartridge. Areas shall be roughened a minimum 1 in. around holiday using Carborundum cloth or 80 grit sandpaper and wiped clean with a cloth or brush prior to patching.

7.2 Areas larger than 0.15 sq. in. (0.3 sq. cm.), but less than 1.0 sq. ft. (100 sq. cm.) shall be repaired using a Protal Repair Cartridge. The surface to be coated shall be clean and dry prior to applying the coating. Surfaces below 40°F (4°C) shall be pre-heated in accordance with Section 5.2. Areas requiring repair shall be prepared with a surface grinder or by grit blasting prior to application of the coating. All edges of the surrounding area should be feathered prior to performing the repair.

7.3 Refer to "7200 Accelerated Cure Specifications for Repairs" for additional information.

8.0 Safety Precautions

8.1 Follow the guidelines detailed in the Safety Data Sheets (SDS).

8.2 Keep containers closed when not in use. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations.

8.3 Always refer to project specifications as they may supercede Denso specifications.

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PRODUCT DATA SHEET

PROTAL 7200 REPAIR CARTRIDGE

Fast Cure Epoxy Repair Coating

Description

Protal 7200 Repair Cartridges are specially formulated for patching and repairing damaged FBE and other liquid coated pipelines. The repair cartridges are packaged in 2-component tubes that are applied with a dispensing gun (sold separately). Two convenient sizes (400 ml and 50 ml) are available.

Uses

Repair coating for damaged FBE and other liquid coated pipelines. Also used as coating of cadweld areas.

Features

- Excellent adhesion (compliments FBE coated pipe)
- Fast cure
- High build (up to 70 mils / 1778 microns in one coat)
- High abrasion resistance for drilling applications
- Can be used as an abrasion resistant coating (ARO)
- Does not shield cathodic protection
- Meets AWWA C-210-92 specifications
- Outstanding self-leveling characteristics
- CSA Z 245.30-14 compliant

Application

Surface shall be roughened approximately 1" (25 mm) around all repair areas using a Carborundum cloth or 60 to 80 grit sandpaper and than remove the remaing dust with a clean, dry cloth, brush or clean compressed air. Material can be applied by injecting material into a small container and mixing until a uniform color is achieved or utilizing the Protal Static Mixing Tip. Material can then be brush applied to specified mil thickness (minimum 20 mils / 508 microns). Cure times are dependent on temperature and will be extended at cooler temperatures.

*Please refer to "Protal 7200 Accelerated Cure Specifications for Repairs" to achieve a 5 minute cure time.

Protal 7200 Repair Cartridge (400 ml)

Protal Cartridge Gun 3:1 (400 ml)
Sold Separately

Protal Cartridge Gun 3:1 (50 ml)
Sold Separately

Protal 7200 Repair Cartridge (50 ml)

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Protal 7200 Repair Cartridge

Technical Data

Properties	Value
Solids Content	100%
Mixed Material - (Mixed) @ 77°F (25°C)	
Specific Gravity	1.63
Viscosity	170,000 cps
Color	Green
Mixing Ratio (A/B) by Volume	3 Parts Base: 1 Part Hardener
Cure Times	
Pot Life @ 77°F (25°C)	14 - 17 Minutes
Pot Life @ 97°F (36°C)	7 - 8 Minutes
Handling Time @ 77°F (25°C)	2.5 - 3 Hours
Handling Time @ 117°F (47°C)	1 Hour
Handling Time @ 157°F (69°C)	20 Minutes
Recoat Window	
@ 57°F (14°C)	5 Hours
@ 77°F (25°C)	2 Hours
@ 97°F (36°C)	1 Hour
Theoretical Coverage	14 ft^2 (1.3 m^2) /30 mils/liter
Thickness - Weld Joints / FBE Repairs	
Minimum/Maximum	20/70 mils (508/1178 microns)
Recommended	25 - 30 mils (635 - 762 microns)
Thickness - Bore Pipe	
Minimum/Maximum	40/70 mils (1016/1178 microns)
Recommended	45 - 60 mils (1143 - 1524 microns)
Holiday Detection	Refer to NACE SPO188
Cathodic Disbondment Test (ASTM G95)	
28 Days @ 77°F (25°C)	3 mm
28 Days @ 150°F (65°C)	4 mm
28 Days @ 185°F (85°C)	6 mm
28 Days @ 203°F (95°C)	6 mm
Hardness (ASTM D-2240-02)	Shore D 85 +/-2
Impact Resistance (ASTM G14-04) @ 32°F (0°C)	70.6 in-lbs.
Tabor Abrasion (ASTM 4060-07)	
-1000 cycles, CS-17 wheels, 1000 g. load	1,270 cycles per mil
Gouge Resistance (Partech Test - 40 kg load)	15.4 mils (391 microns)
Dielectic Strength (ASTM D-149)	450 V/mil (17,716 V/mm)
Adhesion to Steel (ASTM D-4541-02)	3,956 psi (27.3 MPa)
Adhesion to FBE (ASTM D-4541-02)	2,579 psi (17.8 MPa)
Service Temperature	-40°F to 203°F (-40°C to 95°C)
Application Temperature	-30°F to 212°F (-34°C to 100°C)

Note: If temperature falls below 50°F (10°C), surface must be preheated and maintained throughtout the cure process.

STORAGE: Minimum 24 months when stored in original containers @ 40°F (4°C) to 105°F (41°C). On job site where temperatures are below 50°F (10°C) product should be kept warm to mix properly (65°F to 85°F optimal).

CLEANING: Clean equipment with MEK or equivalent solvent cleaner.

HEALTH AND SAFETY: Apply under well ventilated conditions. Wear suitable protective clothing and glasses. See material safety data sheets.

PACKAGING: 400 ml and 50 ml dual cartridges.

Dispensing guns and static mixing tips (400ml or 50ml) sold seperately.

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PRODUCT DATA SHEET

PROTAL 7200

Fast Cure, High Build Pipeline Coating

Description

Protal 7200 is a VOC free, 100% solids, 2 part epoxy coating specially formulated to compliment FBE coated pipe. It is a high build liquid coating that is brush or spray applied (referred to as Protal 7250 in Canada) in one coat in the field or shop. It cures very fast to allow quick handling and backfill times.

Uses

On-site protection of girth welds, tie-ins, welds for boring applications, repairs to FBE, push-rack applications, station piping, fittings and fabrication. Also used for main line pipe coating, sacrificial coating for directional drill (ARO) and road bore pipe, and rehabilitation of existing pipelines.

Features

- Fast touch dry and set times
- High temperature resistance up to 203°F (95°C)
- High build (up to 70 mils / 1778 microns in one coat)
- Excellent adhesion (compliments FBE coated pipe)
- High abrasion resistance for drilling applications
- Can be used as an abrasion resistant coating (ARO)
- Safe and environmentally friendly
- Does not shield cathodic protection
- Can be applied with brush, roller or spray
- Available in a variety of packaging options
- Meets AWWA C-210-92 specifications
- Outstanding self-leveling characteristics
- CSA Z 245.30-14 compliant

Application

Brush: Prepare surfaces by grit blasting to a clean near-white finish, SSPC-SP 10 / NACE No. 2. Appropriate angular grit shall be used to achieve a 2.5 to 5 mil (63 to 127 microns) anchor profile. Initially stir the base and hardener. Add the hardener to base and mix at a slow speed until a constant color is achieved making sure all sides of container are scraped. Apply mixed material onto surface and brush, trowel or roll to required mil thickness. A wet-film thickness gauge shall be used to measure mil thickness. If surface temperature falls below 50°F (10°C), surface should be preheated to achieve faster cure. Preheat may be achieved with a propane torch or induction coil. Resin and hardener component shall be kept warm, at a minimum of 60°F (15°C), to mix easily.

Spray: Prepare surfaces by grit blasting to a clean near-white finish, SSPC-SP 10 / NACE No. 2. Appropriate angular grit shall be used to achieve a 2.5 to 5 mil (63 to 127 microns) anchor profile. The equipment shall be a XP70 Plural Component Sprayer designed to mix and atomize 100% solids epoxies. Please refer to the Protal 7200 Plural Spray Application Specification for equipment details. Part A should be heated to 140°F - 160°F (60°C - 71°C) and Part B heated to 100°F - 110°F (38°C - 43°C). Hose bundle shall be set at 140°F - 150°F (60°C - 65°C). A wet on wet spray technique should be used to achieve a minimum thickness of 20 mils (508 microns). The coating thickness should be measured using a wet-film thickness gauge. The equipment settings are only guidelines and may vary based on equipment.

All application personnel shall be trained by a Denso representative prior to application of Protal 7200. Spray application personnel shall be trained in the proper spray pump operational procedures by the specific spray pump manufacturer's representative.

For complete application instructions please refer to the Protal 7200 Application Specifications.

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Protal 7200

Technical Data

Properties	Value
Solids Content	100%
Mixed Material - (Mixed) @ 77°F (25°C)	
Specific Gravity	1.63
Viscosity	170,000 cps
Color	Green
Mixing Ratio (A/B) by Volume	3 Parts Base: 1 Part Hardener
Cure Times	
Pot Life @ 77°F (25°C)	14 - 17 Minutes
Pot Life @ 97°F (36°C)	7 - 8 Minutes
Handling Time @ 77°F (25°C) Shore D 70 min.	2.5 - 3 Hours
Handling Time @ 117°F (47°C) Shore D 70 min.	1 Hour
Handling Time @ 157°F (69°C) Shore D 70 min.	20 Minutes
Recoat Window	
@ 57°F (14°C)	5 Hours
@ 77°F (25°C)	2 Hours
@ 97°F (36°C)	1 Hour
Theoretical Coverage	14 ft^2 (1.3 m^2)/30 mils/liter
Thickness - Weld Joints / FBE Repairs	
Minimum/Maximum	20/70 mils (508/1778 microns)
Recommended	25 - 30 mils (635 - 762 microns)
Thickness - Bore Pipe	
Minimum/Maximum	40/70 mils (1016/1778 microns)
Recommended	45 - 60 mils (1143 - 1524 microns)
Holiday Detection	Refer to NACE SPO188
Cathodic Disbondment Test (ASTM G95)	
28 Days @ 77°F (25°C)	3 mm
28 Days @ 150°F (65°C)	4 mm
28 Days @ 185°F (85°C)	6 mm
28 Days @ 203°F (95°C)	6 mm
Hardness (ASTM D-2240-02)	Shore D 85 +/-2
Impact Resistance (ASTM G14-04) @ 32°F (0°C)	70.6 in-lbs.
Tabor Abrasion (ASTM 4060-07)	
-1000 cycles, CS-17 wheels, 1000 g. load	1,270 cycles per mil (93 mg)
-5000 cycles, CS-17 wheels, 1000 g. load	1,612 cycles per mil (338 mg)
Gouge Resistance (Partech Test - 40 kg load)	15.4 mils (391 microns)
Dielectic Strength (ASTM D-149)	450 V/mil (17,716 V/mm)
Adhesion to Steel (ASTM D-4541-02)	3,956 psi (27.3 MPa)
Adhesion to FBE (ASTM D-4541-02)	2,579 psi (17.8 MPa)
Service Temperature	-40°F to 203°F (-40°C to 95°C)
Application Temperature	-30°F to 212°F (-34°C to 100°C)

Note: If temperature falls below 50°F (10°C), surface must be preheated and maintained throughtout the cure process.

STORAGE: Minimum 24 months when stored in original containers @ 40°F (4°C) to 105°F (41°C). On job site where temperatures are below 50°F (10°C) product should be kept warm to mix properly (65°F to 85°F optimal). Do not allow material to freeze.

CLEANING: Clean equipment with Xylene, MEK, Acetone or equivalent solvent cleaner.

HEALTH AND SAFETY: Wear protective clothing and ensure adequate ventilation. Avoid contact with skin and eyes. See material safety data sheet for further information.

PACKAGING: 1, 1.5, 1.75 and 2 liter kits and 75 liter & 800 liter kits standard. Dual cartridge repair tubes (50 ml, 400 ml & 1000 ml) and dispensing guns available for small repair areas.

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