

# 3M™ Scotchkote™ Liquid Epoxy Coating 327

## Hand Application Guide for External Protection of Steel Pipes

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**Product Description** 3M Scotchkote Liquid Epoxy Coating 327 is a two part liquid epoxy coating designed to protect steel pipe and other metal surfaces from corrosion.

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**Handling and Safety** Consult with the appropriate safety officer for the PPE requirements for your particular situation.

Additional information on exposure controls & personal protection is covered in the product's Safety Data Sheet.

**Storage** Keep in original container at 40°-100°F/4°-38°C in temperature controlled storage. Protect containers from damage during storage and transportation.

**Disposal of Coating Containers** Dispose of waste product material in a facility permitted to accept chemical waste. Since regulations vary, consult applicable regulations or authorities before disposal. Allow mixed material to harden before disposal.

Follow applicable regulations for disposal of spilled material. Refer to SDS in Further Accidental Release Measures section.

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### Manufacturer's Qualified Application Procedure per CSA Z245.30

*Product qualified to meet FC1& FC3 Coating systems as described in CSA Z245.30*

*This MQAP is applicable to product manufactured after 1/1/2014.*

### Tools, consumables, and equipment required to apply the coating system

\*Proper calibration and working condition of all tools and equipment is expected to be validated prior to use.

- 1) Heating Sources:
  - a) induction heating coils
  - b) infrared heaters
  - c) indirect heating
  - d) direct flame
    - i) Liquid or gas propane only
- 2) Compressed Air
  - a) Filter and oil separator capable of providing clean air as visually inspected using a blotter test
  - b) Desiccant air dryer capable of drying the compressed air supply

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- 3) Inspection: refer to [Companies QA/QC procedures and inspection requirements]
- 4) Steel Surface Preparation
  - a) Dry abrasive blasting equipment able to produce > 90 psi at the nozzle
  - b) Blast media capable of producing an anchor profile of 2.5 – 4.5 mils and surface cleanliness of at least near white metal finish per NACE No.2 /SSPC SP-10, or ISO 8501-1
- 5) Mixing
  - a) Variable speed power drill and mixing paddle.
    - i) Spiral mixer 75 mm (3" in diameter) is suggested
    - ii) Variable compressed air or electric drill is required
  - b) Manual mixing stick
- 6) Cleaning
  - a) Rags, brushes, short nap rollers and utility knife
    - i) Short nap (5mm) roller & short bristle brush
  - b) Non-Oily solvents such as; Methyl Ethyl Ketone, Xylene, Ethanol, Isopropyl Alcohol, and Acetone
  - c) Masking tape
- 7) Repair
  - a) 80 or 120 grit sand paper
  - b) Clean lint free dry cloth

#### **Surface preparation of the steel**



- 1) Blasting media: Angular abrasives allowed in the jurisdiction where the work is being conducted that can produce an angular anchor profile of 2.5-4.5 mils and a surface cleanliness of at least near white metal finish per NACE No.2/SSPC SP-10, or ISO 8501-1 SA 2 ½
- 2) Soluble salts to be removed using agreed upon cleaning method
- 3) Maintain the surface at the specified dew point (see surface preheat)
- 4) Brush blast the factory applied coating on the overlap areas using a feathering technique removing the gloss from the factory applied coating. Overlap the factory applied coating at least 2" unless otherwise specified.

#### **Compatibility with other 3M Anti-Corrosion Coatings**

3M Scotchkote Coating 323, 327, 328, 6233P, 6352HF, & 6352 are all compatible. Other coating systems may be compatible. However, you will need to determine which coating is suitable for your intended application. Please consult with 3M for more information.

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**Preheat Methods Prior to Coating Application**

- 1) Induction heating (Preferred method).
- 2) Infrared heaters
- 3) Indirect heating or direct flame



**Surface temperature range during surface preparation, application, and cure**

- 1) Preheat temperature is; 45°-195°F/10°-90°C and always at least 5°F/3°C above the measured Dew Point up until the material is applied.
  - a) Preheating shall not damage the mainline coating or the coating being repaired;
  - b) or raise the temperature of the pipe above 300°F/150°C
- 2) Drying Properties Guide for Scotchkote Coating 327

Ambient Air Temperature	Pot Life	Dry To Touch Time	Back Fill Time	Recoat Window
40°F/5°C	40 minutes	5-6 hours	8-10 hours	5 hours
60°F/16°C	25 minutes	2-3 hours	3-5 hours	2.5 hours
75°F/23°C	15 minutes	1-2 hours	2-3 hours	1.5 hours
85°F/29°C	8 minutes	40-50 minutes	1-2 hours	30 minutes
100°F/38°C	5 minutes	20-40 minutes	30-40 minutes	15 minutes
120°F/49°C	3 minutes	10-20 minutes	20-30 minutes	5 minutes

**Note\*** because of variations of temperature the above table only provides a reference, therefore the actual time to backfill shall be determined by a Shore D durometer test.

- 3) Post-curing Scotchkote Coating 327 may be required when the ambient conditions hinder the coating from reaching a Shore D hardness of 80. These conditions include but not limited to, temperatures below 45°F/10°C and high winds. Post curing may be required to achieve proper Shore D, apply induction heating, infrared heating, or indirect heating methods. Direct flame methods are not acceptable in this case. Raise the temperature of the coating, at the weld, to a maximum of 195 °F/90°C or as specified by the pipeline owner (company) at the time of application. Preheat temperatures shall not damage existing coating. After obtaining this temperature remove the heat source and allow coated area to air cool before inspecting shore D hardness

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#### **Ambient conditions**

- 1) Scotchkote Liquid Epoxy Coating 327 shall not be applied when the relative humidity exceeds 90% or when the steel surface to be coated is less than 5°F/3°C above the measured dew point

#### **Coating mixing and thinning procedures**

- 1) Thinning of the coating product is not allowed
- 2) Premix individual components prior to mixing parts A and B
- 3) Use variable speed power drill and mixing paddle
  - a) At time of mixing and application, coating material temperature shall be 50°-85°F/15°-30°C
  - b) Pour coating product B into coating product A and power mix for about one minute
    - i) Mixing speed should not create a vortex in the liquid
    - ii) Minimize entrapment of air.
  - c) The liquid epoxy coating needs to be one uniform color with no streaks before application
  - d) Immediately after mixing apply the properly mixed materials to the previously prepared steel surface
    - i) Upon completion of coating application, the remnant base material (Part A) shall be mixed with the hardener (Part B) container to solidify the waste.

#### **Coating Thickness** (*Note: \*\*The pipeline owners specification is the default requirement for allowable coating thickness*).

- 1) Mainline rehabilitation or girth welds; optimum thickness is 20-35 mils/508 - 890 µm targeting 25mils (635 µm) based on maximum operating temperature of 95C; Maximum allowable thickness is 70 mils/1778 µm consideration to a reduction flexibility should be made prior to coating outside of the optimum thickness range.
- 2) Horizontal Directional Drilling (HDD); 40-70 mils/1016 - 1778 µm targeting 55 mils/1397µm.

#### **Coating Application**

- 1) Validate surface is meeting the requirements of NACE No.2/SSPC SP-10, or ISO 8501-1 SA 2 ½ and the surface profile requirements
  - a) If flash rusting is observed, the steel surface shall be re-blasted before application
- 2) Pour mixed material onto the surface to receive coating and spread down and around the surface under the pipe; to meet desired requirements (i.e. CSA Z245.30, ISO 21809-3, etc).
- 3) Brush or other required technique to meet industry the desired industry standards (i.e. CSA Z245.30, ISO 21809-3, etc). Roll the coating onto the existing coating at 2"- 3" of overlap unless otherwise specified
  - a) Always remove application tool on the up-stroke to prevent pulling material down and off the surface
- 4) Where practical determine wet film thickness
- 5) Use a brush to smooth out obvious curtains, runs, sags, drips, and protuberances
  - a) Special attention is required to the bottom and weld surfaces
  - b) An additional application of coating increasing the film thickness on the bottom of the pipe or weld area may be required
- 6) Protect coating until moisture and other contaminants such as dust, insects and airborne particulates do not contaminate the finished coating
- 7) If used, remove masking tape when coating is dry to touch

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**Repair Methods**

1. Repair Method A (holidays or damaged areas less than 2 mm in diameter)
  - a) Remove oil, grease, and loosely adhering deposits from existing coating.
  - b) Abrade the coating surface with coarse sandpaper (80-120 grit) using a circular motion
  - c) Ensure that the surrounding coating is abraded (remove gloss) two inch beyond the defect on all sides
  - d) Ensure abraded surface is cleaned with non-contaminating method
  - e) With surface temperature between 45°F/7°C and 200°F/95°C, apply 3M Scotchkote Liquid Epoxy Coating 327 at minimum thickness of 20mils/500 microns and 40 mils/1000 microns for HDD applications.
  
2. Repair Method B (Damaged areas revealing bare metal up to 25 cm<sup>2</sup> /4 in<sup>2</sup> in size)
  - a) Remove oil, grease, and loosely adhering deposits
  - b) Abrasive blast as outlined in this application guide, or by power tool cleaning in accordance with SSPCSP 11 to remove dirt, scale, rust, damaged coating and any other foreign material to a bare metal condition and retain or produce the surface profile required.
  - c) Continue with the same steps “c”, “d” and “e” as in Method A
  
3. Repair Method C (Damaged areas revealing bare metal larger than 25 cm<sup>2</sup> in size)
  - a) Remove oil, grease, and loosely adhering deposits
  - b) Abrasive blast as outlined in this application guide
  - c) Continue with the same steps “c”, “d” and “e” as in Method A

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**Holiday Detection**

Test coating using high voltage holiday detector per CSA Z245.30 (125 volt/mil or 5 volts/micron Do not exceed maximum)

**Document References: 3M™ Scotchkote™ Liquid Epoxy Coating 327 Product Data Sheet.**

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For further information or technical documents: [www.3m.com/corrosion](http://www.3m.com/corrosion)

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