

3M™ Scotchkote™ Liquid Epoxy Coating 323+

Hand Application Guide for External Protection of Steel Pipes

Product Description 3M™ Scotchkote™ Liquid Epoxy Coating 323+ is a two part liquid epoxy coating designed to protect steel pipe and other metal surfaces from corrosion. 3M™ Scotchkote™ Liquid Epoxy Coating 323+ is shipped in premeasured kit; 2 parts of A (base) to 1 part of B (activator). The individual parts A and B are available separately.

Safety, Handling and Storage Consult with the appropriate safety officer for the PPE requirements for particular situation.

Additional information on exposure controls and personal protection is provided in the Product Safety Data Sheets

Keep in original container at 40°F (4°C) - 100°F (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 MSDS in Further Accidental Release Measures section.

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 09/01/2017

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

- 3) Inspection: Refer to companies QA/QC procedures & 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 51 μm – 114 μm (2.0 mils – 4.5 mils) and surface cleanliness of at least near white metal finish per NACE No.2 /SSPC SP-10, or ISO 8501-1 SA 2½.
- 5) Mixing
 - a) Variable speed power drill and mixing paddle.
 - i) Spiral mixer 75 mm (3 inches) 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) ¼ inch (6 mm) Short nap 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: dry grit abrasives, preferably glass beads, steel grit, sand or equivalent media that can produce an angular anchor profile of 51 μm –114 μm (2.0 mils-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) Visible oil and grease contamination to be removed by means of non-oily solvents or other agreed upon cleaning method.
- 3) Soluble salts to be removed using agreed upon cleaning method
- 4) No moisture on the surface coming from snow, ice, rain or condensation
- 5) 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 5 cm – 7.6 cm (2 inches -3 inches) unless otherwise specified.

Compatibility with other 3M Anti-Corrosion Coatings

The coatings shown below are all compatible. Other coating systems may be compatible. Consult with 3M for more information.

- 3M™ Scotchkote™ Liquid Epoxy Coating 323+
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- 3M™ Scotchkote™ Liquid Epoxy Coating 328
- 3M™ Scotchkote™ Fusion-Bonded Epoxy Coating 6233P
- 3M™ Scotchkote™ Fusion-Bonded Epoxy Coating 226N

- 3M™ Scotchkote™ Fusion-Bonded Epoxy Coating 6352
- 3M™ Scotchkote™ Fusion-Bonded Epoxy Coating 6352HF

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

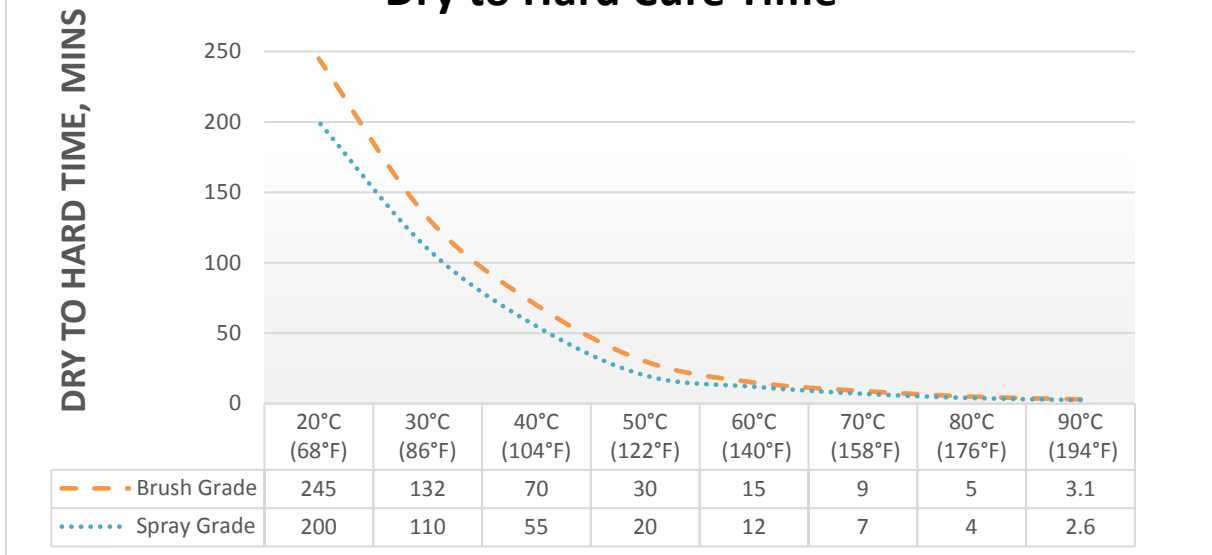
- 1) Pipe preheat temperature is; 10°C-90°C (50°F-194°F) and always at least 3°C (5°F) above the measured dew point
 - a) Preheating shall not damage the mainline coating or the coating being repaired or
 - b) Raise the temperature of the pipe above 150°C (302°F)
- 2) Drying property guide for Scotchkote 323+

Product Temperature	Pot Life	Dry To Touch Time	Back Fill Time	Recoat Window
5°C (40°F)	40 minutes	2-3 hours	11-13 hours	5 hours
15°C (59°F)	22 minutes	1-2 hours	5-7 hours	4 hours
25°C (77°F)	15 minutes	45-105 mins	3.5-4.5 hours	3 hours
35°C (95°F)	11 minutes	30-50 minutes	2-3 hours	2 hours
45°C (113°F)	8 minutes	20-40 minutes	90 - 150 minutes	1 hour

Note* because of variations of temperature the above table provides a reference, therefore the actual time to backfill shall be determined by a Shore D durometer test. Shore D value should be at least 80.

- 3) Post-curing Scotchkote Coating 323+ may be required when the ambient conditions hinder the coating from reaching a Shore D hardness of 80. These conditions may include but are not limited to, temperatures below 10°C (50°F) 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 90 °C (194 °F). After obtaining this temperature remove the heat source and allow coated area to air cool before inspecting shore D hardness.

3M™ Scotchkote™ Liquid Epoxy Coating 323+ Dry to Hard Cure Time



Ambient conditions

- 1) Scotchkote Coating 323+ shall not be applied when the relative humidity exceeds 90% or when the steel surface to be coated is less than 3°C (5°F) 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 15°C-30°C (59°F-86°F)
 - 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 actions which induce entrapment of air; including moving the mixer top to bottom motion and over mixing.
 - 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

- 1) Mainline rehabilitation or girthwelds; optimum thickness is 508 µm - 1016 µm (20-40 mils) targeting 635 µm (25mils) based on maximum allowable operating temperature of 95°C (203°F). Maximum allowable thickness is 70 mils (1778 µm). Consideration for reduced flexibility should be made prior to coating outside the optimal thickness range. Refer to the table above for recommended recoat window, if additional thickness is required.
- 2) Horizontal Directional Drilling applications (HDD): 1016–1778 µm (40–70 mils) targeting 1397 µm (55 mils).

*Note: The pipeline owners specification is the default requirement for the allowable thickness

Coating Application

- 3) 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
 - If flash rusting is observed, the steel surface shall be re-blasted before application
- 4) Using masking tape or other means to define coating overlap area
- 5) Pour mixed material onto the surface to receive coating and spread down and around the surface under the pipe.
- 6) Brush or roll the coating onto the existing coating at 5.1 cm–7.6 cm (2 inches–3 inches) of overlap unless otherwise specified
 - Always remove application tool on the up-stroke to prevent pulling material down and off the surface
- 7) Where practical determine wet film thickness
- 8) Use a brush to smooth out obvious curtains, runs, sags, drips, and protuberances
 - Special attention is required to the bottom and weld surfaces
 - An additional application of coating increasing the film thickness on the bottom of the pipe or weld area may be required
- 9) Protect coating until moisture and other contaminants such as dust, insects and airborne particulates do not contaminate the finished coating
- 10) If used, remove masking tape when coating is dry to touch

Repair Methods

1. Repair Method A – Holidays or damaged areas less than 2 mm (0.08 inches) in diameter
 - a) Remove oil, grease, and loosely adhering deposits
 - 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 inches beyond the defect on all sides.
 - d) Ensure abraded surface is cleaned of any sanding debris with compress air or a lint free cloth
 - e) With surface temperature between 10°C (45°F) and 95°C (203°F), brush apply 3M Scotchkote Coating 323+ to a minimum thickness of approximately:
 - i) Standard single layer coating applications: 508 µm (20 mils).
 - ii) Horizontal Directional Drilling applications: 1016 µm (40 mils) .
 2. Repair Method B – Damaged areas revealing bare metal up to 25 cm² (4in²) in
 - 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 SSPC SP 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 cm² (4in²) in
 - 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 Z245.20 (125 volt/mil or 5 volts/ μm)]

Document References

3M™ Scotchkote™ Liquid Epoxy Coating 323+ Product Data Sheet.

Customer Service

For ordering technical or product information, call:

1-800-722-6721 in the United States

1-800-265-1840 in Canada

For further information or technical documents:

www.3m.com/corrosion

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