



# Scotchkote™

## 323/323i Liquid Epoxy Coatings

### Data Sheet and Application Instructions


#### Product Description

3M™ Scotchkote 323/323i Liquid Epoxy Coatings are two-part systems designed to protect steel pipe and other metal surfaces from the harsh affects of corrosion.

#### Intended Uses

- As a patch material.
- As a girthweld coating.
- As an internal lining
- As a stand alone coating for pipe rehabilitation.
- In a wide variety of other field applications where corrosion protection of metal is required.

#### Product Features

- No solvents needed.
- High build, up to 45 mils/1150 microns in one application.
- Applicable by cartridge, brush, roller or plural component spray.
- Excellent adhesion.
- 100% solids.
- Can be applied to a substrate as cold as 41°F/5°C.
- Meets the requirements of AWWA C210, - 97 clause 4.3.4.1.
- Certified to ANSI/NSF Standard 61, Drinking Water System Components. 

#### Chemical Resistance

Scotchkote 323/323i are resistant to damage by acids and bases in the pH range of 2 to 14. It is also resistant to hydrocarbons such as crude oil, motor oil, gasoline and many solvents. Testing is suggested if the coating is to be used in continual contact with oxidizing agents such as sodium hypochlorite (bleach) and aggressive solvents such as methyl ethyl ketone (MEK).

#### Scotchkote 323/323i Coverage per kit size

| Kit             | Pounds | Assumes no waste               |        |         |
|-----------------|--------|--------------------------------|--------|---------|
|                 |        | Coverage in square feet @ mils |        |         |
|                 | Total  | 10                             | 20     | 30 mils |
| 50 ml           | 0.15   | 2                              | 1      | 0.7     |
| Quart           | 2.082  | 30                             | 15     | 10      |
| Gallon          | 8.378  | 120                            | 60     | 40      |
| 5 gal x 3       | 152.1  | 2160                           | 1080   | 720     |
| 55-gal-drum x 3 | 1690.4 | 24,000                         | 12,000 | 8,000   |

#### General Application Steps

1. Remove oil, grease and loosely adhering deposits.
2. Abrasive blast clean the surface to NACE No. 2/SSPC-SP10, ISO 8501:1, Grade SA 2 1/2 near-white metal. On small areas no greater than 1/2 sq. in., roughening the adjoining coating with a medium grit sandpaper is suitable.
3. Apply Scotchkote 323/323i at a minimum thickness of 25 mils/635mm.
4. Allow to cure.
5. Visually or electrically inspect the coating for defects.
6. Repair all defects.

#### Properties

| Properties                                       | Value                                        |
|--------------------------------------------------|----------------------------------------------|
| Color                                            | Blue-Green                                   |
| Mix Ratio                                        | 2A : 1B by volume<br>70.8% : 29.2% by weight |
| Viscosity in cps @<br>• Brush Grade<br>72°F/22°C | 323<br>Part A: 154,000<br>Part B: 6,000      |
| • Spray Grade                                    | Part A: 90,000<br>Part B: 19,000             |
| Viscosity in cps @<br>• Brush Grade<br>72°F/22°C | 323i<br>Part A: 154,000<br>Part B: 3,500     |
| • Spray Grade                                    | Part A: 90,000<br>Part B: 9,500              |
| Shelf Life (unopened container)                  | 18 months                                    |
| Specific Gravity                                 | 1.35 mixed                                   |
| Coverage                                         | 142 sq ft/lb/mil<br>(0.74m²/kg/mm)           |
| Max Operating Temperature<br>• Wet<br>• Dry      | 203°F/95°C<br>250°F/121°C                    |
| Minimum Coating Thickness                        | 25 mils/635mm recommended                    |

#### Number of Quarts Needed per Weld

| Pipe Diameter (inches) | Total Length to coat (cut backs + overlaps) |          |           |           |
|------------------------|---------------------------------------------|----------|-----------|-----------|
|                        | 6"/15 cm                                    | 8"/20 cm | 10"/25 cm | 12"/30 cm |
| 6                      | 0.06                                        | 0.08     | 0.10      | 0.13      |
| 12                     | 0.13                                        | 0.17     | 0.21      | 0.25      |
| 20                     | 0.21                                        | 0.28     | 0.35      | 0.42      |
| 24                     | 0.25                                        | 0.33     | 0.42      | 0.50      |
| 30                     | 0.31                                        | 0.42     | 0.52      | 0.63      |
| 36                     | 0.38                                        | 0.50     | 0.63      | 0.75      |
| 42                     | 0.44                                        | 0.59     | 0.73      | 0.88      |
| 48                     | 0.50                                        | 0.67     | 0.84      | 1.00      |

## Typical Test Properties

| Property                                                                                                             | Test Description                                                                                  | Typical Value                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shyodu Gel Time<br>(approximate pot life)                                                                            | 200 gm mass                                                                                       | 75°F / 24°C 20 min<br>104°F / 40°C 11 min                                                                                                                                                     |
| Dry to Touch Time                                                                                                    | ASTM D1640<br>clause 7.5.2                                                                        | 41°F / 5°C 7 hrs<br>75°F / 24°C 1 hr 45 min<br>122°F / 50°C 26 min                                                                                                                            |
| Approximate Back Fill Time<br>(For additional information<br>see chart below)                                        | ASTM D1640<br>clause 7.7.1                                                                        | 41°F / 5°C 8 hrs<br>75°F / 24°C 2 hr 39 min<br>122°F / 50°C 39 min                                                                                                                            |
| Cathodic Disbondment<br>(steel grit blasted plates laboratory applied;<br>results may vary depending on blast media) | CSA Z245.20-02<br>clause 12.8                                                                     | 149°F / 65°C, 3.5V, 24 hrs 4.9 mmr<br>149°F / 65°C, 1.5V, 48 hrs 5.5 mmr<br>149°F / 65°C, 1.5V, 28 days 7.5 mmr<br>176°F / 80°C, 1.5V, 14 days 6.4 mmr<br>176°F / 80°C, 1.5V, 28 days 6.6 mmr |
| Adhesion of Coating                                                                                                  | CSA Z245.20-02<br>clause 12.14                                                                    | 203°F / 95°C 24 hrs Rating 1<br>167°F / 75°C 48 hrs Rating 1<br>167°F / 75°C 28 days Rating 1                                                                                                 |
| Flexibility                                                                                                          | CSA Z245.20-02<br>clause 12.11                                                                    | 68°F / 20°C 0.7 °/PD<br>32°F / 0°C 0.7 °/PD                                                                                                                                                   |
| Abrasion Resistance                                                                                                  | ASTM D4060-95<br>CS-17 wheels<br>1000 g load<br>5000 cycles<br>wheels resurfaced every 500 cycles | 0.325 g loss                                                                                                                                                                                  |
| Impact Strength                                                                                                      | ASTM G14                                                                                          | 323 = 73.6 inch-lbs (8.3 Joules) at 75°F / 24°C<br>323i = 60.9 inch-lbs (6.8 Joules) at 75°F / 24°C                                                                                           |
| Impact Resistance                                                                                                    | CSA Z245 20-98<br>Clause 12.12                                                                    | See Chart Below                                                                                                                                                                               |

Impact value is the last Joule where three impacts have passed

| Panel Number | Test Temperature | Joule Value | Holiday detection voltage | Average DFT (mils) |
|--------------|------------------|-------------|---------------------------|--------------------|
| 1            | -40°F/-40°C      | 1.5         | 2500                      | 30.4               |
| 2            | -22°F/-30°C      | 1.0         | 2500                      | 24.5               |
| 3            | 14°F/-10°C       | 1.5         | 2500                      | 27.2               |
| 4            | 32°F/0°C         | 1.5         | 2500                      | 25.0               |
| 5            | 68°F/20°C        | 2.75        | 2500                      | 26.9               |
| 6            | 122°F/50°C       | 2.5         | 2500                      | 27.7               |
| 7            | 149°F/65°C       | 4.0         | 2500                      | 27.0               |
| 8            | 176°F/80°C       | 3.5         | 2500                      | 26.3               |

### Shore D Hardness vs. Time and Temperature

| Time      | 10°C (50°F) | 20°C (68°F) | 30°C (86°F) | 40°C (104°F) |
|-----------|-------------|-------------|-------------|--------------|
| 1 hour    | --          | --          | --          | --           |
| 1.5 hours | --          | --          | --          | 72           |
| 2 hours   | --          | --          | --          | 76           |
| 2.5 hours | --          | --          | 72          | 79           |
| 3 hours   | --          | 72          | 76          | 79           |
| 3.5 hours | --          | 73          | 78          | 79           |
| 4 hours   | --          | 75          | 80          | 79           |
| 4.5 hours | --          | 76          | 81          | 80           |
| 5 hours   | --          | 77          | 82          | 82           |
| 5.5 hours | --          | 79          | 82          | 82           |
| 6 hours   | --          | 80          | 82          | 81           |
| 6.5 hours | --          | 81          | 83          | 81           |
| 7 hours   | 72          | 82          | 83          | 82           |
| 7.5 hours | 73          | 82          | 83          | 81           |
| 8 hours   | 73          | 83          | 84          | 83           |
| 9 hours   | 74          | 83          | 83          | 81           |
| 17 hours  | 82          | 85          | 84          | 84           |
| 3 days    | 85          | 85          | 85          | 85           |

### Repair of Fusion Bonded Epoxy Coating

Scotchkote™ coating requiring limited repair (scrapes, scars, coating imperfections or other minor defects) should be cleaned to remove dirt, scale and damaged coating by sanding or other suitable means. Feather the adjacent coating and remove all dust by wiping. Next, the coating should be applied to a minimum thickness of 25 mils/635 µm. The freshly coated area should be allowed to properly cure prior to handling and storage. Cure can be accelerated with heat.

### Surface Preparation for 323/323i Brush Grade and 323/323i Spray Grade

Coating performance is dependent on the cleanliness of the substrate surface receiving the coating. This surface must be clean, dry, free of loose rust and scale paint, etc. Remove all oils, grease and other contaminants with a suitable solvent. Metal should be blast cleaned in accordance with NACE No. 2/SSPC-SP10, ISO 8501:1, Grade 2 1/2 to a near-white finish using a suitable abrasive.

To prevent the formation of rust or oxide, coat as soon as possible after cleaning. For maximum protection, the coating must have direct contact with the metal surface.

### 323/323i Brush Grade Application Instructions

1. Mix separate parts A and B.
2. Pour part B into part A. Scotchkote 323/323i have a mix ratio of 2A to 1B by volume.
3. Thoroughly mix combined parts into a uniform color.

### Pot Life (Approximate)

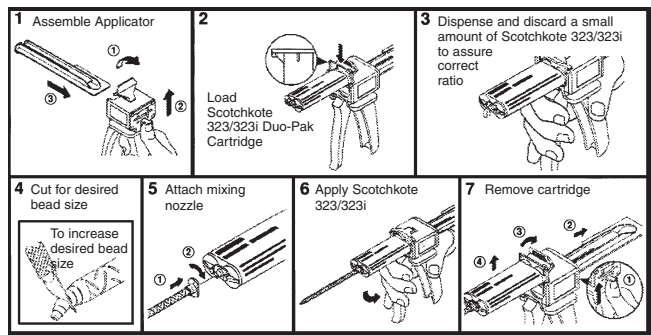
| 200 gm mass  |            |
|--------------|------------|
| 75°F (24°C)  | 20 minutes |
| 104°F (40°C) | 11 minutes |

### Recommendations

- Prepare only the quantity of coating that can be applied in this period of time within the pot life.
- A 1/4"/6mm nap roller is suggested.
- For speed of application, and to extend the working life of the product, pour mixed product directly to the top of the substrate/pipe, then spread the mixture down around pipe to the desired thickness.

Using a brush or roller, apply Scotchkote 323/323i to a minimum thickness of 25 mils/635 µm or as specified. Overlap the pipe coating no less than 1"/25 mm. Allow coating to properly cure before handling.

### Scotchkote 323/323i Patch Compound Applicator



### Multiple Coats

Scotchkote 323/323i have been formulated to achieve a coating thickness of up to 45 mils/1150 microns in one coat. If additional thickness is required, apply the additional coats within three hours of the initial coat. This coating may be applied in any thickness consistent with producing an acceptable surface finish.

### Circumferential Weld - Fusion Bonded Epoxy Coating

The welded joint must be clean; free of mud, oil, grease, and other foreign contaminants. The exposed metal in the weld zone must be blast cleaned in accordance with NACE No. 2/SSPC-SP10, ISO 8501:1, Grade 2 1/2 to a near-white finish using a suitable abrasive. The adjacent fusion-bonded coating should be brush blasted to clean and roughen the surface for a distance of 2"/50 mm back from the weld zone.

### Helpful Spray Information

- Suggested tip size of 625.
- Tip pressure approximately 2,200 psi/15.2 MPa.
- Preheat Part A to 150°F / 66°C.
- Preheat Part B to 120°F / 49°C.
- Mix ratio of pumps is 2:1.

### Equipment Clean-Up

MEK or toluene may be used to clean spray equipment, rollers and brushes. Utilize proper safety guidelines.

## Handling and Safety Precautions

Read all Health Hazard, Precautionary, and First Aid statements found in the Material Safety Data Sheet, and/or product label prior to handling or use.

## Ordering Information/Customer Service

For ordering information, technical information, product information or to request a copy of the Material Safety Data Sheet:

Phone: 800/722-6721 or 512/984-1038

Fax: 877/601-1305 or 512/984-6296

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