

# 3M™ Scotchkote™

## Liquid Epoxy Coatings 323/323i

### Data Sheet and Application Instructions

#### Product Description

3M™ Scotchkote™ Liquid Epoxy Coatings 323/323i 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, HSS or plural component spray.
- Excellent adhesion.
- 100% solids.
- VOC for Parts A and B as mixed 12 g/L
- 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).

#### 3M™ Scotchkote™ 323/323i Coverage per kit size (Assumes no waste)

| Kit             | lbs of material | Coverage in square feet @ mils |          |          |
|-----------------|-----------------|--------------------------------|----------|----------|
|                 | Total           | 25 mils                        | 28 mils  | 30 mils  |
| 50 ml           | 0.15            | 0.85                           | 0.76     | 0.71     |
| 450 ml          | 1.34            | 7.63                           | 6.81     | 6.36     |
| Quart           | 2.10            | 11.90                          | 10.60    | 9.90     |
| Gallon          | 8.70            | 47.70                          | 42.60    | 39.70    |
| 5-gal x 3       | 152.10          | 865.80                         | 773.00   | 721.50   |
| 55-gal drum x 3 | 1,690.40        | 9,621.80                       | 8,590.90 | 8,018.10 |

#### Number of U.S. Quarts/.95 L 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        |

\*Assumes no waste. Based on a coating thickness of 25 mils.

#### General Application Steps

For use as a joint coating, a refurbishing coating or as a pipe coating:

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.
3. Ensure the abraded surface is cleaned of abrading debris with the use of an air blast or a clean lint free cloth.
4. Within four hours of blasting as per the above cleaning process and with the metal above 41°F/5°C and a minimum of 5°F/3°C above the dew point, apply Scotchkote 323/323i at a minimum thickness of 635 microns or 25 mils.
5. Allow to cure.



6. Visually or electrically inspect the coating for defects.
7. Repair all defects using Scotchkote 323/323i as a repair material.

**For use as a repair material in the field where scratches or other holidays may have occurred.**

1. Remove oil, grease and loosely adhering deposits.
2. Abrade the FBE surface with medium grit sandpaper (approx 80 grit). Powered rotary sanders and sweep blasting are also acceptable means of performing this task as well. Ensure that the surrounding FBE is roughened for 10 mm on all sides of the holiday. An anchor pattern of 40 to 100 microns is preferred on the steel substrate.

3. Ensure the abraded surface is cleaned of abrading debris with the use of an air blast or a clean lint free cloth.
4. With the metal above 41°F/5°C and a minimum of 5°F/3°C above the dew point, apply Scotchkote 323/323i at a minimum thickness of 635 microns or 25 mils.

#### Properties

| Property                           | Value                                                          |                                  |
|------------------------------------|----------------------------------------------------------------|----------------------------------|
| Color                              | Blue-Green                                                     |                                  |
| Mix Ratio                          | 2A : 1B by volume<br>70.8% : 29.2% by weight                   |                                  |
| Viscosity in cps @                 | 323                                                            | 323i                             |
| • Brush Grade<br>72°F/22°C         | Part A: 154,000<br>Part B: 6,000                               | Part A: 154,000<br>Part B: 3,500 |
| • Spray Grade<br>72°F/22°C         | Part A: 90,000<br>Part B: 19,000                               | Part A: 90,000<br>Part B: 9,500  |
| Shelf Life<br>(unopened container) | 24 months                                                      |                                  |
| Specific Gravity                   | 1.35 mixed                                                     |                                  |
| Coverage                           | 142 ft <sup>2</sup> /(lb/mil)<br>(0.74m <sup>2</sup> /(kg/mm)) |                                  |
| Max Operating Temperature          |                                                                |                                  |
| • Wet                              | 203°F/95°C                                                     |                                  |
| • Dry                              | 250°F/121°C                                                    |                                  |
| Minimum Coating Thickness          | 25 mils/635 microns recommended                                |                                  |

#### Typical Test Properties

| Property                                                                                                             | Test Description                                                                                     | Typical Value                                                                                                   |                                                   |                                                     |
|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|
| Shyodu Gel Time<br>(approximate pot life)                                                                            | 200 gm mass                                                                                          | 75°F / 24°C<br>104°F / 40°C                                                                                     | 18 Min<br>11 min                                  |                                                     |
| Dry to Touch Time                                                                                                    | ASTM D1640<br>clause 7.5.2                                                                           | 41°F / 5°C<br>75°F / 24°C<br>122°F / 50°C                                                                       | 7 hrs<br>1 hr 45 Min<br>26 min                    |                                                     |
| Approximate Back Fill Time<br>(For additional information see chart below)                                           | ASTM D1640<br>clause 7.7.1                                                                           | 41°F / 5°C<br>75°F / 24°C<br>122°F / 50°C                                                                       | 8 hrs<br>2 hr 39 min<br>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,<br>149°F / 65°C, 1.5V,<br>149°F / 65°C, 1.5V,<br>176°F / 80°C, 1.5V,<br>176°F / 80°C, 1.5V, | 24 hrs<br>48 hrs<br>28 days<br>14 days<br>28 days | 4.9 mmr<br>5.5 mmr<br>7.5 mmr<br>6.4 mmr<br>6.6 mmr |
| Adhesion of Coating                                                                                                  | CSA Z245.20-02<br>clause 12.14                                                                       | 203°F / 95°C<br>167°F / 75°C<br>167°F / 75°C                                                                    | 24 hrs<br>48 hrs<br>28 days                       | Rating 1<br>Rating 1<br>Rating 1                    |
| Flexibility                                                                                                          | CSA Z245.20-02<br>clause 12.11                                                                       | 68°F / 20°C 0.7<br>32°F / 0°C 0.7                                                                               | %PD<br>%PD                                        |                                                     |
| Abrasion Resistance                                                                                                  | ASTM D4060-95<br>CS-17 wheels<br>1000 g load<br>5000 cycles<br>wheels resurfaced<br>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 Resistance

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           |

## Scotchkote 323/323i Brush Grade Mixing Instructions

1. Mix parts A and B separately.
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)

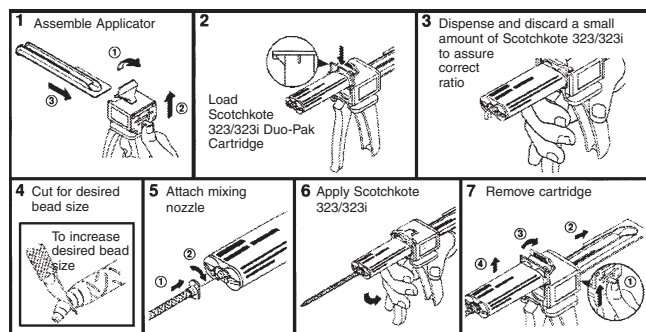
| Based on 7-ounce (200-gram) samples |            |
|-------------------------------------|------------|
| 75°F (24°C)                         | 20 minutes |
| 104°F (40°C)                        | 11 minutes |

## Recommendations

- Prepare only the quantity of coating that can be applied in this period of time within the pot life.
- A 1/4" (6 mm) nap, lint-free 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 pull the mixture down around pipe in one direction with brush.
- Because of the high viscosity of this product, we suggest mixing parts A & B together at temperatures above 68°F (20°C).

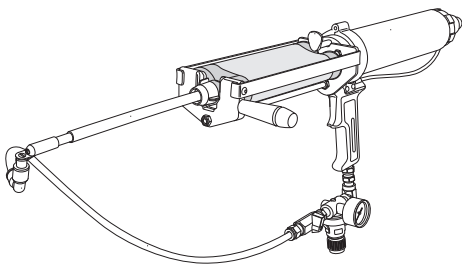
Using a brush or roller, apply Scotchkote 323/323i to a minimum thickness of 25 mils (635 µm) or as specified. Overlap the pipe coating no less than 1" (25 mm). Allow coating to properly cure before handling.

## 3M™ Scotchkote™ 323/323i Patch Compound Applicator



## 3M™ Scotchkote™ Spray System HSS-450

The application of Scotchkote 323/323i has been simplified using the 3M™ Scotchkote™ Spray System HSS-450. The HSS-450 system utilizes a dual-cartridge setup along with unique application equipment designed specifically to spray apply Scotchkote 323/323i.



### Handling and Safety Precautions

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

### Important Notice

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For more information and additional literature on the Scotchkote HSS-450 system, please visit our web site at [www.3M.com/corrosion2010](http://www.3M.com/corrosion2010) or contact our Customer Service Center at 1-800-722-6721.

### 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 four hours of the initial coat. This coating may be applied in any thickness consistent with producing an acceptable surface finish.

### Helpful Plural Component 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.

### Ordering Information/Customer Service

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

Phone: 800/722-6721 or 512/984-9393

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



### Corrosion Protection Department

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80-6111-8345-2-M