

3M™ Scotchkote™ Liquid Coatings

Coating of Buried Steel with Plural-Component Applied Coatings

Application Specification

1.0 Scope

- 1.1 This specification defines the application requirements of Scotchkote™ plural-component coating materials applied to steel substrates for buried service.
- 1.2 The coating materials described in this specification can be applied in either a shop or field environment.

The below ground parts to be considered are as follows:

- Piping and Components such as elbows and tees
- Girth welds/field joints
- Valves
- Steel sump tanks
- Slip bore/directional piping
- Other parts as directed by the end user

2.0 Definitions

- 2.1 PART – All below grade service steel that is to be coated under the direction of this specification.
- 2.2 APPLICATOR – the Company selected by the END USER to apply multi-component coatings to the internal and external surfaces of PARTS.
- 2.3 MANUFACTURER – the Company responsible for the chemical formulation and characteristics of the multi-component coatings applied to PARTS.
- 2.4 INSPECTOR – The company or person selected by the END USER to ensure quality control of the work and adherence to this specification, where applicable.
- 2.5 END USER – Pipeline or part owner.

3.0 Additional Requirements

- 3.1 All specifications and standards mentioned in this document form part of this specification. The applicator shall ensure that a copy of this specification is kept at the coating site and shall ensure that his workers fully understand each specification and standards listed below.

- 3.2 The following standards (latest issue) shall be a part of this specification:

Society of Protective Coatings (SSPC)

SSPC-SP1	Solvent Cleaning
NACE No. 2 SSPC-SP10	Near-White Metal Blast Cleaning
SSPC-VIS-1-89	Pictorial Surface Preparation Standard

NACE International

RP0287-87	NACE Standard Recommended Practice for Field Measurement of Abrasive Blast Cleaned Surfaces Using Replica Tape
RP0490-01	Holiday Detection of Fusion-Bonded Epoxy External Pipeline Coatings of 250 to 760 µm (10 to 30 mils)

4.0 Surface Preparation

- 4.1 Prior to commencement of work, all parts shall be visually inspected.
- 4.2 Rough welds and other sharp projections shall be ground smooth by the end user or as designated by the inspector.
- 4.3 All surfaces to be coated shall be abrasive blast cleaned. Prior to abrasive blast cleaning, remove all contaminants such as salt, dirt, and accumulations of grease and oil in accordance with SSPC-SP1 using cleaning agents approved by the end user.
 - 4.3.1 Applicator shall perform tests to determine existence of salts.
- 4.4 Prior to abrasive blasting, the steel surface shall be dry and warmed to a temperature at least 3° C (5°F) above the dew point to prevent oxidation of the part after cleaning. The applicator shall use a contact thermometer, psychrometer, and psychrometric charts, or equipment that provides equivalent accuracy, to monitor these environmental requirements.
- 4.5 Nameplates, valve stems, rotating equipment, threads, bolts, adjacent coatings etc., shall be protected from blasting and coating by suitable masking materials.



- 4.6 All coating compressor units shall have adequate separators, filters, and drains to ensure contaminants such as oil and water are not deposited onto the steel surface. Accumulations of oil and moisture shall be removed by regular purging.
- 4.7 For bare steel application, the abrasive blast medium shall be selected on the basis of cleanliness, hardness and the ability to produce an angular anchor pattern profile averaging 0.075 mm (3.0 mils) – 0.10 mm (4.0 mils). Individual measurements shall not be less than 0.065 mm (2.5 mils). Profile measurements shall be taken with replica tape and spring micrometer in accordance with NACE RP0287-87.
- 4.8 The part shall be abrasive blasted in accordance with the NACE No. 2 or SSPC-SP10 specification, and the applicator shall ensure this surface finish is attained by regular checks with the SSPC-VIS-1-89 Standard.
- 4.9 When over-coating existing coating material, such as fusion bond epoxy in such applications as field joint or abrasion resistant overcoat work, the existing coating shall be sweep blasted to remove the gloss and provide a roughened surface suitable for over-coating. This process should remove approximately 1 mil of coating.
- 4.10 Existing coating shall be feathered 4 cm (1.5 in.) to 8 cm (3 in.) when coating adjacent bare steel, such as girth welds.
- 4.11 Profile measurements shall be taken, as a minimum, at the start of each shift, after a shut down to refill blasting pots, after every hour of continuous blasting.
- 4.12 Cleaned surfaces shall be dry air blasted to remove dust and debris, and shall be coated before any rust blooming occurs, and prior to the end of the working day. Any cleaned steel showing rust stains or left uncoated overnight shall be re-blasted prior to coating.
- 5.4 The steel surface temperature shall be at least 3°C (5°F) higher than the dew point temperature. The relative humidity and the steel surface temperature shall not be higher than the recommended maximum. The applicator shall use a contact thermometer, a psychrometer and psychrometric charts, or equipment that provides equivalent accuracy, to monitor these environmental requirements.
- 5.5 Application shall be done in such a manner so as to keep sags and runs to a minimum, provide adequate cover in angles and crevices, and to provide a smooth uniform coat.
- 5.6 If several coats are required to achieve the specified coating thickness, a maximum of 3 hours are suggested in between applying each additional coat. If the recommended maximum recoat time has been exceeded, each coat shall be abraded prior to applying an additional coat.

6.0 Quality Control, Inspection and Testing, Acceptance

6.1 Coating Thickness

6.1.1 The coating thickness shall be measured using a wet film thickness gauge. As a minimum, the applicator shall obtain readings according to the following schedule:

- Piping – at four quadrants (i.e. 12, 3, 6 and 9 o'clock positions) at approximately 1 – 1.5m (3.3 - 5ft) intervals along each pipe length.
- Girth welds – at four quadrants at each girth weld.
- Valves and tanks – at ten representative, random locations.
- Other parts – as determined by the end user so as to obtain representative thickness data.

6.2 Visual

6.2.1 The coating shall be inspected for, and be free of, the following conditions:

- Pinholes
- Missed or skipped areas
- Roughness
- Blistering, cracking, delamination

6.2.2 Runs and sags shall be kept to a minimum.

5.0 Coating Application

- 5.1 The coating shall be applied following the guidelines in Appendix 2:
- 5.2 Thinning is not allowed.
- 5.3 The coating thickness shall be as specified in Appendix 1. The applicator shall measure and record coating thickness using a thickness gauge that is acceptable to the end user/inspector.

6.3 Holiday Testing

- 6.3.1 The applicator shall test each part completely for coating integrity per RPO490-01 based on the minimum measured acceptable thickness. A low voltage (60 to 100 volts) wet sponge holiday detector may be used on nuts and bolts and restricted areas. Holiday detection equipment shall be checked and calibrated before production begins and recalibrated at the start of each shift. Operations of the holiday detector shall be controlled so that the travel rate does not exceed 300mm per second (1 foot per second). The equipment shall not remain stationary on the coating while the power is on.
- 6.3.2 Holiday testing shall take place after the coating has exceeded 80% of its hardness value.
- 6.3.3 All holidays and defects shall be plainly marked immediately after detection and shall be repaired in accordance with this specification.
- 6.3.4 To minimize possible coating damage due to repeated holiday testing, APPLICATOR shall limit the number of passes over a coated area with the holiday detector.

7.0 Coating Repairs

- 7.1 Either the spray grade material that the PART was coated with or the patch/brush grade materials specified for repair.
- 7.2 Remove the defect, or defective coating, to sound coating or to bare steel by abrading the repair area with coarse sandpaper or a power sander.
- 7.3 If, after defect removal, more than 160 cm² (25 in.²) of bare steel is exposed, prepare entire exposed surface as per Section 6.0 of this specification.
- 7.4 Abrade the surrounding coating for a distance of 4 cm (1.5 in.) radially to ensure proper inter-coat adhesion. Except for microscopic holidays, feather the edges of the original coating.
- 7.5 Prior to patching, remove all loose particles and dust with dry compressed air or a clean, dry cloth.
- 7.6 Recoat the prepared surfaces to the specified dry film thickness, lapping at least 2.5 cm (1 in.) over the surrounding coating.
- 7.6.1 Holiday testing shall take place after the coating has exceeded 80% of its hardness value.
- 7.7 Holiday test the repair at the same voltage as used for the original coating.

8.0 Handling

- 8.1 Parts shall be handled at all times in such a manner to prevent damage to the coating or the part.
- 8.2 Transporting vehicles shall be free from debris, nail heads, or any other protrusions that may damage the part. The applicator shall ensure sufficient and proper dunnage is used to protect the coated part.

Appendix 1: Minimum Thickness

Product	Thickness
Scotchkote 323 Spray Grade	25 mil minimum
Scotchkote 323 Brush Grade	25 mil minimum
Scotchkote 352HT Spray Grade	25 mil minimum
Scotchkote 352HT when used as an ARO (Abrasion Resistant Overcoat)	30 - 40 mils

Appendix 2:

3M™ Scotchkote™ 352HT Spray Application

- Plural component spray setup of 3:1 by volume for Part A:Part B
- Whip hose of 8-12 feet, max 15 feet/4.6 meters
- Recommended tip size of 27 ml minimum, with a fan size appropriate for your application
- Fluid pressures of 2,500-3,500 psi with Part A and Part B within 250 psi of each other
- Preheat Part A to approximately 155°F/68°C. This may be changed to get acceptable spray pattern and pressure equalization.
- Part B does not need to be heated.
- Heated hose bundle set at a minimum temperature of 110°F/43°C

3M™ Scotchkote™ 323 Spray Application

- Plural component spray setup of 2:1 by volume for Part A:Part B
- Whip hose of 10-15 feet
- Recommended tip size of 625 or a tip size appropriate for your application
- Fluid pressures of 2,500-3,500 psi with Part A and Part B within 250 psi of each other
- Preheat Part A to approximately 155°F/68°C. This may be changed to get acceptable spray pattern.
- Heated hose bundle set at 120°F/49°C to 150°F/66°C

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.

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