



Thurmalox® 218 Primer/219 Topcoat Coating Under Insulation (CUI) System Wet/Dry Thermal Cycling to 450°F Apply Directly to Hot Steel

Description

Thurmalox 218 Primer/219 Topcoat System is a VOC compliant, high build, modified silicone coating formulated for the protection of metal surfaces under insulation exposed to temperatures from ambient to 450°F (232°C). This coating system is specifically formulated to be applied directly to surfaces operating between ambient temperature and up to 350°F (177°C). Thurmalox 218/219 performs exceptionally in continuous CUI immersion of hot and/or boiling water. The system has excellent resistance to continuous and/or rapid wet-dry-wet thermal cycling to 450°F (232°C). It is tough, durable and has excellent resistance to damage during transportation, storage, erection and insulation applications.

Recommended Uses

- Insulated hot equipment and piping
- Insulated equipment exposed to severe thermal shock to 450°F (232°C)
- Equipment under insulation exposed to wet-dry-wet cyclic conditions from ambient to 450°F (232°C)

Features

- Apply directly to metal surfaces as hot as 350°F (177°C)
- Coat hot equipment without being shut down
- Maintains greater flexibility at elevated temperatures as compared to conventional epoxy systems.
- Re-insulate after 24 hours
- High solids, high build
- Excellent thermal cycling resistance
- VOC compliant system

Surface Preparation - Carbon Steel

1. To ensure optimum long-term coating system performance, surfaces must be clean, dry and free from dirt, oil, grease, salts, welding flux, mill scale, rust, oxides, old paint, corrosion products or other foreign matter.
2. Remove all surface imperfections that will induce premature coating system failure. Chip or scrape off weld splatter. Grind down sharp and rough edges, gouges, and pits.
3. Abrasive blast surface per specification SSPC-SP 10, "Near-White Blast Cleaning", or per NACE Standard No. 2 to a profile depth of 1.5 - 2.0 mils. Abrasive used in blasting should be selected carefully from materials of mesh size required to produce the desired anchor pattern.

Application Guidelines

Surface temperature must be at least 5°F (3°C) above dew point.

Insulated Carbon and Stainless Steel*

Primer: Thurmalox 218	5.0-6.0 mils (125-150 microns)
Topcoat: Thurmalox 219	5.0-6.0 mils (125-150 microns)
Total dry film thickness	10.0-12.0 mils (250-300 microns)

Surface Preparation - Stainless Steel

1. Surfaces must be clean and dry. Remove all oil, grease, soil, drawing and cutting compounds, and other foreign matter by methods outlined in Steel Structures Painting Council Specification SSPC-SP 1, "Solvent Cleaning", using Dampney 170 Cleaning Solvent.
2. DO NOT USE CHLORINATED SOLVENTS ON STAINLESS STEEL SURFACES.
3. For large surface areas blast with "Starblast XL"™ to achieve a surface profile of 1.5-2.5 mils.
4. For small surface areas, power sand following SSPC-SP 11, "Power Tool Cleaning", using 16 or 24 grit aluminum oxide coated abrasive fiber disc attached to a rubber pad backer.

*Starblast is a Dupont registered trademark

Application Guidelines

Surface temperature must be at least 5°F (3°C) above dew point.

Uninsulated Stainless and Carbon Steel*

Primer: Thurmalox 218	5.0-6.0 mils (125-150 microns)
2 nd coat: Thurmalox 219	5.0-6.0 mils (125-150 microns)
Topcoat: Thurmalox 217	1.5-2.0 mils (35-50 microns)

Mixing

Thurmalox 218 Primer and Thurmalox 219 Topcoat are two component coatings consisting of a Part A and Part B that must be mixed together before use. The mix ratio for Thurmalox 218 is 4:1 and that of Thurmalox 219 is 2:1 by volume. The individual component should be mixed

Bulletin 218/219

separately to disperse pigment uniformly. Add Part B to Part A and mix thoroughly with a low-speed power mixer for a minimum of 3 minutes or until mixed coating is completely blended and of uniform color.

Application Equipment

Thurmalox 218/219 coatings may be applied by brush, roller, airless spray or conventional spray. **Brush/Roller:** Extra care should be taken to measure and hold film thickness when applied by brush and roller. This method should only be used when spray method is not available. **Brush:** Use a medium china bristle with steel shank and wooden handle. Do not use synthetic-bristled brushes. **Roller:** Use a wooden handled roller with a 1/2" phenolic cored lambs wool roller attached. Roll coating out thoroughly, maintaining a continuous wet edge and uniform appearing paint film.

Conventional Spray:

Spray gun	DeVilbiss JGA402 or equal
Fluid tip	EF
Air Cap	704
Fluid hose*	3/8" ID
Air hose	5/16" ID
Atomizing pressure	60 psi

Provide material pot with agitator, regulators for fluid and air pressure, and oil and moisture traps in supply line.

*Smaller hose diam. or length over 25 ft. may require increased pressure.

Airless Spray:

Spray gun	Graco 205-591, 208-663
Fluid tips*	163-610, 163-315
Pump	Graco Bulldog 30:1
Fluid hose	3/8" to 1/2" ID
Air pressure to pump	100 psi
Pump operating pressure	80-90 psi

*Use Reverse-A-Clean® tips for fast, easy clean out.

Procedures for Application to Hot Surfaces

1. Flush spray equipment with Dampney 162 Thinner before use.
2. Thinning of Thurmalox 218/219 coatings is not normally required for spray application.
3. Dampney 162 Thinner is a high flash point (102°F), slow evaporating solvent formulated especially for application to hot surfaces.
4. **WARNING!** DO NOT use any other solvents to thin Thurmalox 218/219 coatings. A fire hazard may result from use of solvents with low auto ignition temperatures when applying Thurmalox 218/219 coatings to hot surfaces, and rapid solvent evaporation can cause dry spray and poor film characteristics.
5. Use Dampney 162 Thinner cautiously. Addition of a small amount of thinner will cause a great reduction in coating viscosity. Excessive thinning will cause runs or sags.

For conventional spray use adequate air pressure and volume to obtain proper atomization. Be aware that procedures for applying coatings to hot surfaces are somewhat different from those normally used for application to ambient temperature surfaces.

The following factors should be taken into consideration:

- a) Heat radiating from the surface and/or strong winds will promote dry spray.
- b) To avoid dry spray, always apply coatings perpendicular to hot surfaces without reaching.
- c) Perpendicular spraying will also minimize overspray and lap marks.

On each pass of the spray gun a thinner than normal paint film must be applied to facilitate the heat-accelerated escape of solvents without leaving pinholes.

Note: Thurmalox 218 will take on an amber tone at 250°F (121°C). This is normal.

Thinning

Only thin Thurmalox 218/219 coatings with Dampney 162 Thinner. Do not thin beyond federal, state and/or local VOC emission regulations. Note: Use of other thinners not approved by Dampney may hinder product performance and void product warranty.

Cure Time 200°F (93°C) 50% RH

Thurmalox 218/219 Coating System will cure within 8 hours. Allow 4 hours dry time between coats with a maximum recoat time of 5 days. A temperature of 200°F (93°C) must be achieved for the coating system to withstand hot/boiling water. Higher application temperature will reduce cure time.

Cleanup

Thoroughly flush spray equipment and hoses immediately after use with Dampney 162 Thinner. Dismantle spray equipment and clean parts, brushes and rollers with Dampney 162 Thinner.

Storage

Store in a cool, dry place with temperature between 50°F and 100°F (10°C and 38°C). Keep container closed when not in use.

Precautionary Information

WARNING: Flammable Liquid and Vapor

Keep away from heat, sparks and flame. Vapors may cause flash fire. Do not breathe vapors or spray mist. Avoid contact with eyes, skin and clothing. Use with adequate ventilation during mixing and application. Wear an appropriate, properly fitted organic vapor cartridge-type respirator (NIOSH approved) during and after application unless air monitoring demonstrates vapor/mist levels are below applicable limits. Follow respirator manufacturer's directions for respirator use. Wash thoroughly after handling. Wear protective gloves, chemical safety goggles and impervious protective clothing. Use skin cream. In confined spaces it is required to use a positive pressure supplied-air respirator (NIOSH approved). Use explosion-proof lights and electrical equipment. Use only nonsparking tools and equipment. Wear conductive and nonsparking footwear. Make certain all electrical equipment is grounded. Observe all safety precautions and follow procedures described in OSHA regulations. See Material Safety Data Sheet (MSDS) for complete precautionary and disposal information.

If instructions and warnings cannot be strictly followed, do not use this product.

FOR INDUSTRIAL USE ONLY

TECHNICAL DATA

Characteristics	Thurmalox 218 Primer	Thumalox 219 Topcoat
Generic Type	Modified Silicone	Modified Silicone
Mix Ratio by volume	4:1	2:1
Color	Light Gray	Black
Temperature resistance**		
Continuous	450°F (232°C)	450°F (232°C)
Intermittent	500°F (260°C)	500°F (260°C)
Percent (%) Solids by volume	61	58
Dry film thickness per coat	5.0 – 6.0 mils (125 – 150 microns)	5.0 - 6.0 mils (125 - 150 microns)
Wet film thickness per coat	8.0 – 10.0 mils (200 – 250 microns)	8.0 - 10.0 mils (200 - 250 microns)
Theoretical coverage	1000 mil. sq. ft. per gallon 24 sq. m. @ 25 microns per liter	937 mil. sq. ft. per gallon 22 sq. m. @ 25 microns per liter
Application temp. @ 50% RH	Ambient 50°F-350°F (10°C-177°C)	Ambient 50°F-350°F (10°C-177°C)
*Cure time @ 50% RH		
To recoat (minimum)	4 hours	4 hours
To recoat (maximum)	5 days	5 days
To re-insulate	24 hours	24 hours
Weight per gallon	11.1 lb (5.0 kg)	14.6 lb (6.6 kg)
Pot life	2 hours	2 hours
Shelf life	1 year	1 year
Volatile organic compounds	2.5 lb./gal. (300 g./l.)	2.8 lb./gal. (336 g./l.)

* A temperature of 200°F (93°C) must be achieved for the coating system to withstand hot/boiling water.

** Note 218 will change to amber color at 250°F (121°C). This is normal.

TEST DATA

Test Data	Thumalox 218 Primer / 219 Topcoat
Boiling water immersion resistance	Cyclic immersion - 3 months - no effect
Ambient water immersion resistance	Cyclic immersion - 3 months - no effect
Thermal shock resistance	450°F (232°C) quenched into cold water 40 cycles in 6 hrs
Salt fog resistance	
Unscribed	ASTM B 117-95 5,000 hrs no effect
Scribed	ASTM B 117-95 5,000 hrs no undercutting at scribe
Hardness	ASTM D 3363-92A 6H
Adhesion	ASTM D 3359-95 5B
Splash and spill resistance	30% sulfuric acid excellent
	10% hydrochloric acid excellent
	85% phosphoric acid excellent
	5% acetic acid excellent
	5% sodium hydroxide excellent
	29% ammonium hydroxide excellent
	Methyl iso-butyl ketone excellent
	Iso-propyl alcohol excellent
	Mineral spirit excellent
	E E acetate excellent

WARRANTY: Dampney protective coating products are expressly warranted to meet applicable technical and quality specifications. The technical data contained herein are accurate at the date of issuance but are subject to change without prior notification. No warranty of current accuracy is hereby given or implied. User must contact Dampney to verify correctness before ordering. Dampney assumes no responsibility for coverage, performance or injuries resulting from handling or use and **LIABILITY, IF ANY, SHALL BE LIMITED TO PRODUCT REPLACEMENT.** In no event will Dampney be responsible for consequential damages, except insofar as mandated by law. Dampney **DISCLAIMS ALL OTHER WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**