Dampney® Protective Coatings

Thurmalox® 225HD
High Build, Air Dry, High Temperature
VOC Compliant Coating

Description
Thurmalox 225HD is a modified silicone coating system used for the protection of carbon and stainless steel surfaces from atmospheric corrosion and corrosion under insulation. It is intended to cover steel surfaces with deep blast profiles therefore eliminating the problem of uncoated peaks and pinpoint rusting. Thurmalox 225HD may be top-coated with itself, Thurmalox 230/230C Series or Thurmalox 260/260C Series.

Recommended Uses
Applications where (1) the benefits and features of Thurmalox 225HD are needed and (2) where federal, state, and/or local authorities require high temperature coatings to be compliant with reduced VOC (volatile organic compound) emissions regulations.

- Hot process equipment in refineries, chemical manufacturing and power generation facilities
- Insulated surfaces from -320°F (-196°C) to 1000°F (538°C).

Features
- High build self-priming formulation
- Two component formulation offers increased film hardness reducing mechanical damage during shipping and handling
- Easy to apply by brush, roller or spray
- Protects thermally insulated austenitic stainless steel from chloride induced stress corrosion cracking
- Withstands temperature of 1000°F (538°C)
- Suitable for cryogenic service down to -320°F (-196°C)
- Complies with SCAQMD Rule 1113 as a High Temperature Industrial Maintenance Coating
- Complies with BAAQMD Rule 3 as a High Temperature Coating
- Complies with NACE SPO198 SS-4, SS-5, CS-4 and CS-6
- Qualifies as an inert multi-polymeric matrix coating

Not Recommended For
- Interiors of breechings
- Interiors of scrubbers

Performance Testing Data
High Temperature Test: ASTM 2485 Method B 1000°F (538°C) 100% Pass

Abrasion Resistance: ASTM D4060 (Heat Cured)
(CS-17 wheel, 500 gm load, 1000 cycles). 320mg loss

Abrasion Resistance: ASTM D4060 (Air Dried)
(CS-17 wheel, 500 gm load, 1000 cycles). 370mg loss

Adhesion: (Air Dried) (ASTM D 4541 Adhesion Elcometer) 500 psi

Flexibility: ASTM D 522 Mandrel Bend Test
Heat Cured: 6.0 mils DFT-13 % elongation
Ambient Cure: 6.0 mils DFT- 22 % elongation

Salt Fog resistance: ASTM B 117 (6 mils DFT)
Heat Cured: no rust, blisters, cracking & delamination and no undercutting – 1500 hours
Ambient Cure: no rust, blisters, cracking & delamination and no undercutting – 1000 hours

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, drawing and cutting compounds, visible and non-visible contaminants and other foreign matter by methods outlined in Steel Structures Painting Council Specification SSPC-SP- 1, “Solvent Cleaning”.
2. Remove all surface imperfections that will induce premature coating system failure. Grind off weld splatter and grind down sharp and rough welds, edges, gouges, slivers and pits in accordance to NACE SPO178.
3. Abrasive blast surface per specification SSPC-SP-10, “Near-White Metal Blast Cleaning”, or per NACE Standard No. 2 to a surface profile depth of 1.5 - 3.0 mils (38-75µm), depending on the coating system to be applied. Abrasive used in blasting should be selected carefully from materials of mesh type and size required to produce the desired sharp anchor profile.
4. If abrasive blasting is not permitted, prepare surface by power tool cleaning per SSPC-SP-11, “Power-Tool Cleaning to Bare Metal”. Use an MBX Bristle Blaster or other types of power-tools to attain a

sharp angular surface profile of 1.5-3.0 mils (38-75µm).

Surface Preparation - Stainless Steel

1. To ensure optimum long-term coating system performance, surfaces must be clean, dry and free from dirt, oil, grease, salts, welding flux, oxides, old paint, corrosion products, drawing and cutting compounds, visible and non-visible contaminants and other foreign matter by methods outlined in Steel Structures Painting Council Specification SSPC-SP- 1, "Solvent Cleaning".
   ***Note:** **DO NOT USE CHLORINATED SOLVENTS ON STAINLESS STEEL SURFACES.**
2. Remove all surface imperfections that will induce premature coating system failure. Grind off weld splatter and grind down sharp and rough welds, edges, gouges, slivers and pits in accordance to NACE SPO178.
3. For optimum adhesion, abrasive blasting as per SSPC-SP-16 or NACE 4 is suggested using garnet, aluminum oxide or other blast media suitable for stainless steel. A sharp angular surface profile depth of 1.5-3.0 mils (38-75µm) is required.
4. If abrasive blasting is not permitted, prepare surface by power tool cleaning per SSPC-SP-11, "Power-Tool Cleaning to Bare Metal". Use an MBX Bristle Blaster or other types of power-tools to attain a sharp angular surface profile of 1.5-3.0 mils (38-75µm).

Mixing

Thurmalox 225HD has a 9:1 mix ratio by volume consisting of a Part A and Part B which must be mixed together before use. The individual components must be first mixed separately to disperse the pigments uniformly and remove any components of the liquid coating that may have settled on the bottom of the cans. 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 a uniform color and homogeneous consistency. Do not open containers until ready to use. Keep lid on container when not in use.

Dry Time at 70°F (21°C) 50% RH

Thurmalox 225HD will air dry, tack and thumb print free within 4-6 hours. A temperature of 350°F (149°C) for 30 minutes minimum must be achieved to cure Thurmalox 225HD before it can be put into wet-dry thermal cycling and cryogenic services. Allow 24-48 hours at the stated dry time of 50°F/10°C - 75°F/24°C and 50% RH prior to shipping and handling. Institute protective measures when shipping and handling surfaces coated with Thurmalox 225HD. Do not use chains for tie-downs, instead use nylon straps and rubber padding which are less damaging to the coating system. Avoid mechanical abrasion during shipping and handling. As with any newly applied coating system expect some degree of coating damage when shipped and handled that will require touch-up painting prior to placing equipment in service. Higher temperatures will reduce tack free, recoat and shipping times. Higher film thickness, inadequate ventilation and cooler temperatures will require longer cure times and could cause premature failure of the coating system. Allow one hour solvent flash off period before heat curing or placing into service. Optimum film properties require a heat cure of 350°F (177°C) for 30 minutes. Equipment protected with the Thurmalox 225HD in the air-dried state will heat cure when placed into service.

Pot Life

After mixing, Thurmalox 225HD must be used within 8 hours at 75°F (24°C). Increased temperatures will shorten pot life, while cooler temperatures will extend pot life.

Application Guidelines

Apply only when air, product and surface temperatures are above 50°F (10°C) and surface temperature is at least 5°F (3°C) above dew point. The relative humidity during application and curing should not exceed 85%. Thurmalox 225HD can be applied by brush, roller, airless spray or conventional spray. During application of the recommended coating systems allow for proper curing between coats. During spray application, hold gun at the required distance from the surface and at right angles without arching while spraying. Overlap each pass 50% to achieve a uniform finish. During brush and roller application, any settled pigment on the bottom of the can should be reincorporated back into suspension of the liquid coating, prior to being applied to the surface. Stripe coating by brush should be used to coat difficult to coat areas, edges and weld seams prior to the first full coat application. If the surface to be coated is pitted, work the coating into the porosity of the surface without allowing the coating to puddle. Stripe coat material should be thinned approximately 20% by volume with the recommended thinner #180. During application of Thurmalox 225HD ventilate area with high volume of air. Always utilize and follow good painting practices. Follow dry time instruction before placing in service.

Application Equipment

Thurmalox 225HD may be applied by conventional spray, airless spray, roller or brush. Do not apply Thurmalox 225HD in heavier films than specified since blistering or cracking may occur. For conventional spray provide material pot with regulators for fluid and air pressure and oil and moisture traps in supply line. Smaller diameter hose may require increased pressure.

Conventional Spray (Preferred spray method)**:**

Spray gun	DeVilbiss MBC-510
Air Cap	704
Fluid Needle	JGA-402-FF

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Fluid tip	FF
Fluid hose*	3/8” ID
Air hose	5/16” ID
Atomizing pressure*	40-50 psi

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

Airless Spray:

Spray gun	Graco 205-591, 208-663
Pump	Graco 30:1 or Greater
Fluid tips*	.017 - .021
Fluid hose	3/8” ID with a 1/4” ID whip
Air pressure to pump*	40-60 psi

*Use Reverse-A-Clean® tips for fast, easy clean out. The above recommended air pressures are a guide and should be altered based on the operational condition of the spray pump and ambient climatic conditions. The minimum amount of air pressure should be used that is required to produce a proper spray fan.

Brush:

Do not use synthetic bristle brushes. Using a natural bristle brush apply the coating is smooth even strokes, overlapping the brush strokes.

Roller: Use solvent resistant 1/2” (12 mm) nap roller cover with phenolic core. Do not flood surface with coating. Roll out excess coating on a suitable, screened surface. Then roll out thoroughly, maintaining a continuous wet edge and uniform appearing paint film. Care should be taken during roller application to ensure the required wet film thickness is being achieved. With roller application additional coats may be needed in order to achieve the recommended dry film thickness.

Recommended Systems

Carbon and Stainless Steel (insulated):

1st Coat: Thurmalox 225HD	4.0-5.0 mils DFT
2nd Coat: Thurmalox 225HD	4.0-5.0 mils DFT
Total System	8.0-10.0 mils DFT

Carbon and Stainless Steel (uninsulated):

1st Coat: Thurmalox 225HD	4.0-5.0 mils DFT
2nd Coat: Thurmalox 230C or 260C	2.0-3.0 mils DFT
Total System	6.0-8.0 mils DFT

Note: Additional Thurmalox coating systems can be applied over Thurmalox 225HD as a finish coating such as Thurmalox 200/200C and 280/280C series. Please consult Dampney for additional topcoat recommendations. When extreme cyclic (fast thermal cycling) conditions are present, consult Dampney Technical Service.

Thinning

Only thin Thurmalox 225HD with Dampney 180 thinner a maximum of 5% by volume. Dampney 180 thinner can be used if encountering dry spray and for other application related conditions. Do not thin beyond federal, state and/or local VOC (volatile organic compound) emission regulations. Note: Use of other thinner not approved by Dampney may hinder product performance and void product warranty, whether expressed or implied.

Cleanup

Thoroughly flush spray equipment and hose 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 temperatures 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 only 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 application 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 non-sparking tools and equipment. Wear conductive and non-sparking footwear. Make certain that all electrical equipment is grounded. Observe all safety precautions and follow procedures described in OSHA regulations. See SAFETY DATA SHEET (SDS) for complete precautionary and disposal information.

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

FOR INDUSTRIAL USE ONLY.

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Replaces issue of 0620

Technical Data

Characteristics	Thurmalox 225HD		
Generic Type	Modified Silicone Co-Polymer		
Mix Ratio	9:1 by volume		
Color	Light Gray		
Number of Components	2		
Pot Life	8 Hours @ 75°F (24°C)		
Percent (%) Volume Solids	50% (+/-2%)		
Dry Film Thickness per coat	4.0-5.0 mils (100 – 125 microns)		
Wet Film Thickness per coat	8.0-10.0 mils (200 – 250 microns)		
Theoretical Coverage at 5.0 mils (125 microns) DFT	160 sq. ft./gallon (3.94 m^2/liter)		
**Application Temp Range @ 50% RH (air and surface)	50°F to 200°F (10°C to 93°C)		
Flash Point	81°F (27.2°C)		
Drying Times @ 50% RH Air-Dry (air and surface)	50°F/10°C	75°F/24°C	94°F/34°C
Touch	6 hours	4 hours	3 hours
Handle	12 hours	8 hours	6 hours
Recoat	48 hours	24 hours	12 hours
*Full Cure	7 days	7 days	7 days
Temperature resistance			
Continuous	-320°F - 1000°F (-196°C - 538°C)		
Intermittent	1200°F (649°C)		
Weight per gallon			
Thurmalox 225HD (Part A)	14.3 lb (6.5 kg.)		
Thurmalox 2252 (Part B)	7.1 lb (3.2 kg.)		
Dampney 180 (thinning)	7.5 lb (3.4 kg.)		
Dampney 170 (stainless steel cleaning)	8.0 lb (3.6 kg.)		
Dampney 162 (cleaning equipment)	6.8 lb (3.1 kg.)		
Shelf Life	1 Year (when stored properly in original unopened containers, indoors and out of the weather)		
Volatile Organic Content (mixed)	3.5 lb/gal. (420 g/l)		

*High Humidity, temperature and coating thickness will affect drying and curing times and could result in solvent entrapment and premature coating failure. Thurmalox 225HD must be air dried for a minimum of 7 days at 75°F(24°C) (air and surface) before insulating.

** For application to surface temperatures ranging from 201°F (94°C) up to 400°F (200°C) please refer to the Thurmalox 225HD Hot Application Procedure.

Warranty: Dampney protective coating products are expressly warranted to meet application 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.