

PRODUCT DESCRIPTION

ChemShield 1839 is a thick-film, internally-reinforced, 100% solids, glass flake filled, AHC (Advanced Hybrid Cycloaliphatic) High Functionality Phenolic Novolac internal lining. ChemShield 1839 is designed for chemical storage tanks in chemical plants, and other areas requiring exceptional chemical resistance in immersion conditions.

ChemShield 1839 is specifically designed to resist high concentration sulfuric acid and other inorganic acids. ChemShield 1839 is spray-applied from 30–125 mils DFT depending on the extent of corrosion. ChemShield 1839 is a two-component system; Resin and Hardener.

ChemShield 1839 is available in 4 versions based on sag resistance (ASTM D4400).

- 1839-000: For horizontal surfaces
- 1839-030: ≤ 30 mils on vertical surfaces per coat
- 1839-060: ≤ 60 mils on vertical surfaces per coat
- 1839-125: ≤ 125 mils on vertical surfaces per coat

PERFORMANCE FEATURES

- Thermal shock resistance.
- Superior resistance to a broad range of acids, alkalis, and solvents.
- Resistant to 98% sulfuric acid.
- Superior bonding qualities
- Can be applied up to 125 mils in one multi-pass coat.

RECOMMENDED USE

Some industries ChemShield 1839 is used in:

- Chemical Processing: tanks, vessels, hazardous waste, secondary containment, chemical plant floors.
- Paper & Pulp: digestors, black liquor tanks, bleaching.
- Mining: acid tanks, scrubbers
- Power Generation: FGD systems, ducts, and stacks

LIQUID PHASE TYPICAL PHYSICAL PROPERTIES

Property	Value	Test Method
Mix Ratio (By Volume):	2 Parts Resin (Part A) : 1 Part Hardener (Part B)	-
Solids (By Volume):	100%	ASTM D3960
Theoretical Flash Point:	Part A: 373°F Part B: 219°F	-
Mixed Density:	10.8 - 11.4 (depending on product version)	ASTM D1475

Product Version	Mixed Viscosity (@ 77°F / 50% RH)	Test Method
1839-000	10000-15000 cps	ASTM D2196
1839-030	30000-45000 cps	ASTM D2196
1839-060	40000-60000 cps	ASTM D2196
1839-125	65000-85000 cps	ASTM D2196

SOLID PHASE PHYSICAL PROPERTIES

Property	Value	Test Method
Color:	Neutral (NU2A) ¹	ASTM D1544
Finish:	35-45 GU (Eggshell)	ASTM D523
Elongation:	8-10%	ASTM D638
Hardness (7 Days @ 77°F ambient):	72 (Shore D)	ASTM D2240
Abrasion Resistance:	110mg loss (CS-17, 1,000 gm, 1,000 cycles)	ASTM D4060
Bond Strength (Concrete):	Should be applied to a properly prepared & primed substrate	ASTM D4541
Bond Strength (Ferrous Metal, 2 mil Blasted Profile):	>1,000 PSI	ASTM D4541
Impact Resistance (in./lbs):	Direct: 52 in./lbs.	ASTM D4541

¹Can be colored with ColorMeld 7250 (Part C) color packs or purchased pre-pigmented.
See section: "ChemShield 1839 Colors" on page 2.

CHEMSHIELD 1839 COLORS

Using Pre-Pigmented Kits (For Plural Component Spray)

Standard Colors:

- Tile Red (RD3A)
- Mayan Blue (BU2A)
- Battleship Gray (GY4B)

Contact your Wolverine Coatings Corporation representative for special colors.

Using ColorMeld 7250 Colorant with ChemShield 1839 NU2A (Neutral Base)

ColorMeld 7250 is the only recommended colorant for ChemShield 1839.

Refer to "Tank Lining Color Chart-PCC" for color selection.

CURE SCHEDULE

Temp./Humid.	Pot Life	Gel Time (110 mL) ASTM D2471	Minimum Re-Coat Time ASTM D4541	Maximum Re-Coat Time ASTM D4541	To Touch ASTM D5895	² Return to Service ASTM D5895
50°F/50% RH	30 min.	65-75 min.	14 hours	48 hours	14-18 hours	72 hours
77°F/50% RH	20 min.	26-30 min.	4 hours	48 hours	2.5-3.5 hours	48 hours
95°F/50% RH	10 min.	15-25 min.	2 hours	24 hours	2-3 hours	24 hours

²Depends on specific chemical and application. Full chemical resistance at 7 days (77°F / 50% Relative Humidity).
Contact your Wolverine Coatings Corporation representative for specific cargo

GENERAL APPLICATION PARAMETERS

Please contact a Wolverine Coatings Corporation representative before specifying or applying ChemShield 1839.

ChemShield 1839 can be used in a large array of circumstances ranging from as low as 12 mils per coat to a thickness of 125 mils dependent upon the exact service scenario of the project.

ChemShield 1839 is most commonly applied in two 25-30 mil coats in most heavy industrial applications. However, some extreme environments and/or highly aggressive cargos may require higher product thickness and/or additional coats. Some situations will require less.

ChemShield 1839-060 and 1839-125 versions allow applicators to apply more product in a single application. In cases where a single coat is applicable, spark testing (ASTM D5162) must be done to insure no pinholes or holidays are present.

Application under the recommended thickness may affect surface appearance. Please consult your Wolverine Coatings Corporation representative for situations that may fall outside of the standard applications.

Product Version	Minimum (dft)	Maximum (dft)	Typical Per Coat (dft)
ChemShield 1839-000 ³	12 mils (133.6 SqFt/Gal)	30 mils (53.4 SqFt/Gal)	20 mils (80.2 SqFt/Gal)
ChemShield 1839-030	20 mils (80.2 SqFt/Gal)	35 mils (45.8 SqFt/Gal) ⁴	20-30 mils (53-80 SqFt/Gal)
ChemShield 1839-060	40 mils (40 SqFt/Gal)	70 mils (22.9 SqFt/Gal) ⁴	40-60 mils (26-40 SqFt/Gal)
ChemShield 1839-125	80 mils (20 SqFt/Gal)	140 mils (11.5 SqFt/Gal) ⁴	80-125 mils (13-20 SqFt/Gal)

³For horizontal surfaces only

⁴Max sag resistance at 77°F / 50% Relative Humidity - ASTM D4400

CONDITIONS DURING APPLICATION & SURFACE PREPARATION

The temperature of the substrate should be at a minimum of 50°F and rising during the cure and at least 5°F above the dew point of the air temperature and relative humidity measured in the vicinity of the substrate. Do not apply if relative humidity is greater than 85%. The coating should not be exposed to water, oil, chemicals or mechanical stress until fully cured.

Concrete:

A suitable Wolverine Coatings Corporation primer must be applied first. Please refer to the Technical Information Bulletin "Preparing Concrete to Receive Coatings or Linings" for the recommended ICRI Concrete Surface Profile in accordance to the desired coating system film thickness. All spalls, cracks, joints, bug holes, or any other surface imperfections should be patched prior to the application of ChemShield 1839 on concrete.

Ferrous Metal:

Immersion

All surfaces to be cleaned in accordance with AMPP SSPC SP 5/NACE 1 White Metal Blast cleaning to achieve a sharp surface profile of 3.0 - 5.0 mils. All weld seams should be ground flush and all weld splatter should be removed.

Non-Immersion (Dry Environment)

All surfaces to be cleaned in accordance with AMPP SSPC-SP 10/NACE 2 Near White Abrasive Blast clean to achieve a sharp surface profile of 3.0 – 5.0 mils.

Ferrous Metal Abrasive Table	
Polymer Coating Thickness	Preferred Abrasive Blast Profile
10 - 30 mils	2 - 3 mil profile
30 - 60 mils	3 - 4 mil profile
60 - 100 mils	3 - 5 mil profile
100 - 125 mils	3 - 5 mil profile

Stainless Steel:

All surfaces to be cleaned in accordance with AMPP SSPC-SP-17 Thorough Abrasive Blast cleaning to achieve a sharp surface profile of 3.0 - 5.0 mils. All weld seams should be ground flush and all weld splatter should be removed.

APPLICATION METHOD

Spray Application

Vertical or horizontal concrete & steel surfaces can be coated via airless spray application. For rough surfaces, back rolling may be required to ensure pits or valleys are properly coated.

For interior tank linings, it is recommended to wet stripe the properly prepared weld seams with a brush and work the material into any pits prior to spraying the first coat of ChemShield 1839. It is recommended to use different / contrasting colors for the first and second coat, to ensure sections aren't missed during the second application.

Squeegee, Roller, and Brush Application

Horizontal concrete floor surfaces can be coated via squeegee, roller, and brush application.

See Technical Information Bulletin: "Guide for Applying Polymer Coatings or Linings with a Squeegee, Roller, and Brush".

APPLICATION DATA

Mixing Ratio By Volume (All Versions):	
ChemShield 1839 NU2A (Neutral Base)	2 Parts Resin (Part A) : 1 Part Hardener (Part B)
ChemShield 1839 NU2A + ColorMeld 7250	2 Parts Resin (Part A) : 1 Part Hardener (Part B) : 0.125 Parts Colorant (Part C)
ChemShield 1839 (Pre-Pigmented)	2 Parts Resin (Part A) : 1 Part Hardener (Part B)

Airless Spray Guide		
<i>The information below are suggested theoretical starting points. Consult with your Wolverine Coatings Representative and spray equipment manufacturer prior to airless spray applications.</i>		
Product Version	Tip Size	Hose Length
1839-000	531 - 543	3/8 inch hose - 1/2 inch hose <100 ft.
1839-030, 1839-060, 1839-125	531 - 543	3/8 inch hose <50 ft. 1/2 inch hose <100 ft.
<i>Ensure to remove spray pump manifold filter prior to spraying ChemShield 1839</i>		
<i>1/4 inch diameter airless hose is not recommended for any application of ChemShield 1839</i>		

The recommended airless equipment is a Graco King Contractor pump or equivalent of either a 56:1, 60:1 or 70:1 ratio in size. A 45:1 King Contractor pump or equivalent can be used on applications using the ChemShield 1839-000, 1839-030, and 1839-060 up to 50 linear from pump to gun. Moving forward Graco will produce 45:1, 60:1, and 70:1 pneumatic Contractor Pumps.

The recommended cleaner to be used is Acetone or MEK (Methyl Ethyl Ketone).

MIXING INSTRUCTIONS FOR PRE-PIGMENTED KITS

Consult WCC Technical Information Bulletin: "Mixing Guide" before installation.
Refer to WCC Video: "Mixing Tutorial - Resinous Material" for in depth, step-by-step mixing instructions.

For 3-Quart Kits and 3-Gallon Kits, Premix Part "A" and Part "B" immediately before use. Pour Part "B" into the Part "A" container and slowly begin mixing with a low-speed drill and steel or polyethylene spiral mixing paddle. Slowly increase speed and mix for 2 minutes. Take caution to avoid whipping air into the material. Scrape the sides, bottom, and corners of the mixing container with a solvent-resistant spatula to incorporate material on container walls and corners, then mix for one minute. Once mixed, pour material into a transfer container and scrape the remaining material out of the mixing container into the transfer container, then mix for one minute. Apply mixed material as soon as possible.

For 15-Gallon kits & 157.5-Gallon kits, Premix Part "A" and Part "B" immediately before use. Measure Part "A" into a clean container that will accommodate the mix. Next, pour Part "B" into the container while avoiding spillage on the sides of the container. Begin slowly mixing with a low-speed mixer and steel or polyethylene spiral mixing paddle. Slowly increase speed and mix for 3 to 4 minutes. Take caution to avoid whipping air into the material. Apply mixed material as soon as possible.

MIXING INSTRUCTIONS FOR NEUTRAL KITS WITH COLORMELD 7250

For 3-Quart Kits and 3-Gallon Kits, Premix Part "A", Part "B", and Part "C" immediately before use. While under agitation, slowly add the ColorMeld 7250 (Part C) into the Resin (Part A) container. Use a solvent resistant spatula to empty entire ColorMeld container into the Resin. Mix for 2-3 minutes, or until ColorMeld is thoroughly incorporated in the Resin. Pour Part "B" into the pigmented Part "A" container and slowly begin mixing with a low-speed drill and steel or polyethylene spiral mixing paddle. Slowly increase speed and mix for 2 minutes. Take caution to avoid whipping air into the material. Scrape the sides, bottom, and corners of the mixing container with a solvent-resistant spatula to incorporate material on container walls and corners, then mix for one minute. Once mixed, pour material into a transfer container and scrape the remaining material out of the mixing container into the transfer container, then mix for one minute. Apply mixed material as soon as possible.

For 15-Gallon kits & 157.5-Gallon kits, Premix Part "A", Part "B", and Part "C" immediately before use. Pour Part "A" into a clean container that will accommodate the mix. While under agitation, slowly add the measured ColorMeld (Part C) into the Resin (Part A) container. Empty entire measured amount of ColorMeld into the Resin. Mix for 2-3 minutes, or until ColorMeld is thoroughly incorporated in the Resin. Next, pour Part "B" into the container while avoiding spillage on the sides of the container. Begin slowly mixing with a low-speed mixer and steel or polyethylene spiral mixing paddle. Slowly increase speed and mix for 3 to 4 minutes. Take caution to avoid whipping air into the material. Apply mixed material as soon as possible.

CHEMICAL RESISTANCE

Summarized; for more chemical resistance information, call your Wolverine Coatings Corporation representative. Films cured for 7 (seven) days at 77°F are unaffected after 1 (one) year immersion at ambient temperatures.

IS - Immersion Service SC - Secondary Containment SS - Spash & Spill NR - Not Recommended NT - Not Tested					
Chemical Type	Chemical	IS	SC	SS	Notes
Acids, Inorganic	10% Hydrochloric	✓	✓	✓	
	37% Hydrochloric	✓	✓	✓	
	10% Nitric	✓	✓	✓	Turns coating orange over time
	50% Phosphoric	✓	✓	✓	
	37% Sulfuric	✓	✓	✓	
	98% Sulfuric	✓	✓	✓	Turns coating & cargo pink over time
Acids, Organic	10% Acetic	NR	✓	✓	
	10% Citric	✓	✓	✓	
	10% Lactic	✓	✓	✓	
	85% Oleic	✓	✓	✓	
Alkalis	10% Ammonium Hydroxide	✓	✓	✓	
	50% Sodium Hydroxide	✓	✓	✓	
Solvents	Ethylene Glycol	✓	✓	✓	
	Isopropanol	✓	✓	✓	
	Methanol	NR	✓	✓	
	d-Limonene	✓	✓	✓	
	Jet Fuel A	✓	✓	✓	
	Gasoline	✓	✓	✓	
	Mineral Spirits	✓	✓	✓	
	Xylene	✓	✓	✓	
	Methyl Ethyl Ketone (MEK)	NR	✓	✓	
Methoxy propyl acetate (PMA)	✓	✓	✓		

PACKAGING SIZE

Kit Size	Resin (Part A)	Hardener (Part B)
3-Quart Kit (3Q):	2 Quarts in a slack filled 1-Gallon Can <i>Approx. Shipping Weight: 5.9 lbs.</i>	1 Quart in a 1-Quart Can <i>Approx. Shipping Weight: 3.0 lbs.</i>
3-Gallon Kit (3G):	2 Gallons in a slack filled 3.5-Gallon Pail <i>Approx. Shipping Weight: 23.3 lbs.</i>	1 Gallon in a 1-Gallon Can <i>Approx. Shipping Weight: 11.3 lbs.</i>
15-Gallon Kit (15G):	10 Gallons in two 5-Gallon Pails <i>Approx. Shipping Weight: 55.0 lbs. per container</i>	5 Gallons in a 5-Gallon Pail <i>Approx. Shipping Weight: 56.2 lbs.</i>
157.5-Gallon Kit (157.5G):	105 Gallons in two 52.5-Gallon Drums <i>Approx. Shipping Weight: 569.0 lbs. per container</i>	52.5 Gallons in a 52.5-Gallon Drum <i>Approx. Shipping Weight: 581.3 lbs.</i>

WOLVERINE COATINGS COMPANION PRODUCTS

Consult with your Wolverine Coatings representative to confirm companion products for your specific application.

- ColorMeld 7250 Colorant
- BondTite 1101 Primer
- FlashPatch 1221 Fast Curing Repair Putty
- IntegraFlex 1921 Horizontal Joint Filler
- IntegraFlex 1922 Vertical Joint Filler

LIMITATIONS

- Do not apply over a wet surface.
- Touchups or repairs of an existing coating are never aesthetically perfect.
- Phenolic novolacs have limited ultraviolet resistance which causes them to chalk, lose gloss, and / or discolor over time.

STORAGE

This product must be stored in accordance with local, state, and federal regulations. Containers should be kept in a dry, cool, well-ventilated space and away from sources of heat and ignition. Containers should be stored at 50° F to 95° F. Containers must be kept tightly closed. Shelf life under these conditions is one (1) year.

SHIPPING

Part A: DOT Non-Regulated, Class 55

Part B: DOT UN3066, Paint Related Material, Corrosive, 8, PGIII, Class 55

HANDLING

Consult WCC TIB: "Epoxy Resin Systems Safe Handling Guide" before use. Handle with care. Stir well before use. Special Concerns: This product contains a Resorcinol based chemical that requires special attention when handling. Proper PPE must be used when handling. Please consult the Wolverine Coatings Safety Data Sheet for specific instructions.

HEALTH & SAFETY

Prior to commencing work, carefully read and follow all Safety Data Sheets (SDS) along with any instruction manuals for product and equipment used for the application of material. Ensure all jobsite, local, state, and federal safety regulations are followed as they are the responsibility of the installation company, general contractor, engineering, EPC firm and/or facility owner. Reference industry standard AMPP Paint Application Guide No. 10 Guide to Safety and Health Requirements for Industrial Painting Projects.

REFERENCES

WCC Color Chart "Tank Lining Color Chart-PCC" | WCC Technical Information Bulletin "Preparing Concrete to Receive Coatings or Linings" | AMPP SSPC SP 5/NACE 1 White Metal Blast | AMPP SSPC-SP-10/NACE 2 Near White Abrasive Blast | AMPP SSPC-SP-17 Through Abrasive Blast | WCC Technical Information Bulletin "Guide for Applying Polymer Coatings or Linings with a Squeegee, Roller, and Brush" | WCC Technical Information Bulletin "Mixing Guide" | WCC Video: "Mixing Tutorial - Resinous Material" | WCC Technical Information Bulletin "Epoxy Resin Systems Safe Handling Guide"

SAFETY

For your safety, all required personal protection equipment should be used when operating machinery or handling chemicals. Concrete dust is a source of silica particles and other hazardous materials that can cause silicosis and other illnesses. Proper safety equipment and methods are the responsibility of the installation company, general contractor, and/or facility owner. Prior to commencing work, carefully read and follow all SDS (formerly MSDS), Technical Data Sheets, and any instruction manuals for products and equipment used during installation. Following the safety regulations of job site, local, state, and federal authorities is the responsibility of the installation company, general contractor, and/or facility owner. This document does not purport to address all applicability and safety concerns, if any, associated with its use. It is the responsibility of the user to determine applicability of the information and products, and to establish appropriate safety practices.

WARRANTY

Wolverine Coatings Corporation warrants its products to be free from defects in material and workmanship. Wolverine Coatings Corporation's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Wolverine Coatings option, to either replacement of products not conforming to this Warranty or credit to the Buyer's account in the invoiced amount of the nonconforming products. Any claim under this warranty must be made by the Buyer to Wolverine Coatings in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the ship date, whichever is earlier. Buyer's failure to notify Wolverine Coatings of such nonconformance as required herein shall bar Buyer from recovery under this warranty.

Wolverine Coatings makes no other warranties about the product. No other warranties, whether expressed, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply.

Any recommendation or suggestion relating to the use of the products made by Wolverine Coatings, whether in its technical literature, or in response to specific inquiry or otherwise, is based on data believed to be reliable; however, the products and information are intended for use by Buyers having requisite skill and know-how in the industry, and therefore it is for the Buyer to satisfy itself of the suitability of the products for its own particular use and it shall be deemed that Buyer has done so, at its sole discretion and risk. Variation in environment, changes in procedure of use, or extrapolation of data may cause unsatisfactory results.

LIMITATION OF LIABILITY

Wolverine Coatings Corporation's liability on any claims based upon Wolverine Coatings Corporation's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or parts thereof which give rise to the claim. In no event shall Wolverine Coatings Corporation be liable for consequential or incidental damages.

LITERATURE REVISION - TDS: ChemShield 1839 - Rev. 241028

Published literature is subject to change without notice. Wolverine Coatings Corporation is constantly engaged in the testing of existing formulations, the development of new innovative technologies, and the evaluation of the latest practices. The latest literature should always be consulted at www.wolverinecoatings.com.



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