THE MAINTENANCE SOLUTOR
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439 High-solid amine-cured epoxy tanks lining

Product Data

• High - build epoxy tank lining.
• High - solids.
• Low VOC

Typical Uses

Industrial - Tank lining for fuel storage or transport. Also suitable for industrial maintenance applications and municipal potable water. Coating for interior of steel fuel tanks, pipelines and hopper cars.

Marine - Ballast tanks; industrial fuel, crude oil tanks and interior areas such as cargo holds.

Khemix 439 white, off-white and ivory conform to FDA regulations as lining for contact with dry foods or for potable water tanks.

Qualifications

USDA – Incidental food contact
FDA – Direct food contact
APIRP1631 – Underground Tanks
MSC/COMSCINST 4750-2 – Saltwater ballast, sanitation, petroleum cargo
DOD-P-23236 Type I
DOD-P-23236 Type IV

Physical Data

Finish	Matte	
Color	White, off-white, ivory, RT-1805 blue	
Components	2	
Curing mechanism	Solvent release, chemical reaction between components and moisture from atmosphere	
Volume solids (ASTM D2697 modified)	86% ± 3%	
Dry film thickness per coat	3-5 mils (75-125 microns)	
Coats	2	
Total minimum DFT	6-10 mils (150-250 microns)	
DOD-P-23236	8 mils (200 microns)	
Fuel tanks	6 mils (150 microns)	
Potable water and Ballast tanks	8 mils (200 microns)	
Theoretical coverage	ft^2/gal	m^2/L
1 mil (25 microns)	1379	33.8
4 mils (100 microns)	345	8.5
VOC	lb/gal	g/L
mixed	1.81	217
mixed/thinned (1¾ pt/gal)	2.28	237

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Temperature resistance	Wet		Dry	
	°F	°C	°F	°C
continuous	120	49	200	93
Flash point(SETA)	°F		°C	
khemix495 cure	110		43	
Khemix 439 resin	108		42	
Khemix 065	78		25	
Khemix 012	2		-17	

Chemical Resistance

The following is a representative list of chemicals to which Khemix 439 may be exposed as a lining. Contact your Alspec representative for recommendations concerning specific requirements.

Aliphatic hydrocarbons
Aromatic 100, 150
Aviation Gasolines
Castor oil
40-60% Caustic (140°F, 60°C)
Crude oil (to 120°F, 49°C)
Diesel fuel
Gasoline, unleaded
Jet fuel
Kerosene
Lube oil
Mineral oil
Oxygenated salt water
Palm Oil (to 160°F, 71°C)
Potable water
Sea water
Toluene
Water
Xylene

Surface Preparation

Coating performance is proportional to the degree of surface preparation. Surface must be clean, dry, undamaged and free of all contaminants prior to coating.

Welds should be continuous with no overlapping steel surfaces or rough edges. Remove all weld spatter.

Steel – Abrasive blast to SSPC-SP10. Blast to achieve an anchor profile of 1 to 2 mils (25 to 50 microns) as determined with a Keane – Tator Surface Profile Comparator, Testex Tape or similar device. Remove abrasive residue or dust from surface.

Apply the first coat of Khemix 439 as soon as possible to prevent blasted surfaces from rusting. Surface must be dry and free of contamination. Spot blast in needed.

Concrete – Clean concrete surface. Abrasive blast (ASTM D4259) or acid etch (ASTM D4260) to remove all previous coatings, chalk and surface glaze or laitance. Fill small holes or voids in cast concrete wall or overhead surfaces with Nu-Klad 114A filler compound before applying Khemix 439. Apply Khemix 439 within 7 days after application of Nu-Klad 114A.

Adhere to all application instructions, precautions, conditions and limitations to obtain the maximum performance. For conditions outside the requirement or limitations described, contact your Alspec representative.

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Environmental Conditions

Temperature	°F	°C
Air	32 to 122	0 to 50
Surface	32 to 140	0 to 60
Material		
Optimum workability	70 to 80	21 to 27

Surface temperature must be least 5°F (3°C) above dew point to prevent condensation during surface preparation and between coat. At freezing temperatures surfaces must be free of ice.

Relative humidity – 40 to 85 percent. Curing mechanism of this product requires moisture for proper and complete cure. If relative humidity is below 40 percent, suitable means should be employed to raise moisture level.

Application Data

Applied over	Prepared steel or concrete			
Surface preparation				
steel	Abrasive blast SSPC-SP10			
concrete	ASTM D4259 or 4260			
Method	Airless or conventional spray			
Mixing ratio (by volume)	4 parts resin to 1 part cure			
Pot life/Induction time	°F/°C			
	90/32	70/21	50/10	32/0
Induction time (mins)	15	30	60	60
Pot life (hrs)	4	10	24	24

NR = Not Recommended

Environmental conditions		
Temperature	°F	°C
air	32 to 122	0 to 50
surface	32 to 140	0 to 60
material	70 to 80	21 to 27
Relative humidity	40-85%	

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation during surface preparation and between coats. At freezing temperatures surface must be free of ice.

Drying time (ASTM D1640)(hours)	°F/°C			
	120/49	70/21	50/10	32/0
through	6	14	72	110
recoat				
minimum	8	16	48	96
maximum(weeks)	1	3	5	8

If maximum recoat time exceeded, roughen surface.

Cure for immersion service (days)	°F/°C			
	120/49	70/21	50/10	32/0
	2	7	14	NR
Thinner	Khemix 065			

Use Amercoat 7 thinner when applying in confined spaces.

Cleaner	Thinner or Khemix 012

GOLDEN ASIA AWARD FOR EXCELLENCE

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Topcoats

Khemix 439 may be top coated with epoxies, vinyls, acrylics, chlorinated rubbers or other topcoats when used in industrial or marine maintenance systems.

Application Equipment

The following is a guide; suitable equipment from other manufacturers may be used. Changes in pressure, hose and tip size may be needed for proper spray characteristics.

Airless spray – Standard equipment, having a 30:1 pump ratio or larger, with a 0.019-0.023 inch tip.

Conventional spray – Industrial equipment such as DeVilbiss MBC or JGA or Binks BBR spray gun and a pressure material pot with mechanical agitator. A moisture and oil trap in the main air supply line and separate regulators for air and fluid pressure are recommended.

Power mixer – Such as Jiffy mixer powered by air or explosion – proof electric motor. Normal propeller-type mixing head is satisfactory.

Application Procedure

Khemix 439 is packaged in the correct proportions of resin and cure which must be mixed together before use.

1. Flush equipment with thinner or Khemix 012 before use.
2. Stir each component separately, then add all the cure (clear) to resin (pigmented). Mix together thoroughly, scraping sides and bottom of container. Mixer with an explosion-proof motor is recommended.
3. Allow an induction period per induction time chart.
4. Thin only as required for workability. Up to 20 percent Khemix 065 per gallon of Khemix 439 may be needed depending upon temperature and equipment capabilities.
5. Stir during application to maintain homogeneity.
6. Apply a wet coat in even, parallel passes; overlap 50 percent to avoid holidays, bare areas or pinholes. If required, cross spray at right angles.
7. Recommended dry film thickness per coat is 3 to 5 mils. Do not exceed 7 mils dry film thickness per coat; otherwise, curing will be impaired and performance may be affected.
8. Should puddling or sagging occur due to excessive buildup, brush out evenly over adjacent areas.
9. Allow first coat of Khemix 439 to dry in accordance with drying time, and apply second coat following the above procedure.
10. After allowing minimum dry time for Khemix 439 system, check film thickness with a nondestructive gauge, such as Mikrotest or Elcometer. If less than specified thickness, apply additional material as needed.

Note: Because of high solids content, film thickness builds rapidly. Check thickness frequently and if too thick use smaller spray gun tip or add more thinner.

11. If a test for film continuity is required, check for bare areas, pinholes or holidays with a nondestructive holiday detector such as Tinker-Rasor Model M-1. Apply additional Khemix 439 to areas requiring touch-up.
12. Clean all equipment with thinner or Khemix 012 immediately after use.

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Drying and Curing

The curing process requires evaporation of solvents, reaction of curing agent with moisture in the air and chemical reaction between the components, and is dependent upon time, temperature, relative humidity and proper ventilation.

To ensure proper cure, relative humidity must be above 40 percent. If film thickness is greater than recommended, a longer drying time is required. At low temperatures, dry film thickness should be in the 3 to 4 mil range for the first coat to achieve good drying properties. However, in no instance should film thickness per coat exceed 7 mils; otherwise, curing will be impaired. Ventilation with clean air is required between coats and during curing period following final coat.

Repair

For repair of damaged, imperfect or thin areas, additional Khemix 439 should be applied in accordance with the above schedule to ensure proper adhesion. If maximum recoat time has been exceeded, roughen surface prior to recoating.

Safety Precautuons

Read each component's material safety data sheet before use. Mixed material has hazards of each component. Safety precautions must be strictly followed during storage, handling and use.

CAUTION – Improper use and handling of this product can be hazardous to health and cause fire or explosion. Do not use this product without first taking all appropriate safety measures to prevent property damage and injuries. These measures may include, without limitation: implementation of proper ventilation, use of proper lamps, wearing of proper protective clothing and masks, tenting and proper separation of application areas. Consult your supervisor. Proper ventilation and protective measures must be provided during application and drying to keep spray mists and vapor concentrations within safe limits and to protect against toxic hazards. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces, such as tanks interiors and buildings.

This product is to be used by those knowledgeable about proper application methods. Alspec makes no recommendation about the types of safety measures that may need to be adopted because these depend on application environment and space, of which Alspec is unaware and over which it has no control.

If you do not fully understand these warnings and instructions or if you cannot strictly comply with them, do not use the product.

Note: Consult Code of Federal Regulations Title 29, labor, parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable federal, state and local regulations on safe practices in coating operations.

This product is for industrial use only. Not for residential use.

Shipping Data

Packaging unit	1 gal	5 gal
cure	1-qt can	1-gal can
resin	1-gal can	5-gal can
Shipping weight(approx)	lb	kg
1-gal unit		
cure	1.9	0.8

resin	12.6	5.7
5-gal unit		
cure	9.1	4.1
resin	61.3	27.9

Shelf life when stored indoors at 40 to 100°F (4 to 38°C)
1 year from shipment dote

Numerical values are subject to normal manufacturing tolerances, colour and testing variances. Allow for application losses and surface irregularities.
This mixed product is nonphotochemically reactive as defined by the south Coast Air Quality Management District's Rule 102 or equivalent regulations.

Warranty

Alspec warrants its products to be free from defects in material and workmanship. Alspec's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Alspec's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming product. Any claim under this Warranty must be made by Buyer's to Alspec 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 delivery date, whichever is earlier. Buyer's failure to notify Alspec of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.
Alspec makes no other warranties concerning the product. No other warranties, whether express, implied, or statutory. No other warranties, whether express, implied, or statutory, such as warranties of merchantability or fitness for a particular purpose, shall apply. In no event shall Alspec be liable for consequential or incidental damages.
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