

485 Multi-Purpose Epoxy

Product Data/

Application Instructions

- Multi-purpose high build epoxy
- High solids high build epoxy intermediate
- Primer for durable systems with wide range of topcoats, including polyurethanes and acrylics
- Ballast water tanklining
- High build anti-corrosive coating for ship hulls
- Excellent shop primer for corrosive service
- Suitable for immersion service
- Outstanding chemical and weather resistance
- Excellent adhesion to inorganic zinc silicate
- Easy application
- Contains no lead or chromate pigments
- Low VOC
- Wide film build range
- Compatible with a variety of substrates and surface preparations

Khemix 485 is a high-performance epoxy coating forming a tough, abrasion-resistant, durable film. It adheres strongly to bare steel, coated steel and inorganic zinc silicate primed surfaces on new construction, repair and field maintenance projects. **Khemix 485** will also adhere to intact painted surfaces and tight rust and may be used to repair itself or inorganic zinc silicate primers. **Khemix 485** provides an excellent barrier to corrosion; its inhibitive pigment version (485PA) affords corrosion inhibition at damaged areas. It has good chemical resistance, making it suitable for use in aggressive environments. **Khemix 485** is userfriendly and can be applied by a variety of methods to produce a smooth, fast-drying film. It is suitable for immersion in both salt and fresh water at temperatures up to 140°F, continuous and can be used as a tank lining for alkaline and salt solutions, petroleum fuels, and certain chemicals. **Khemix 485** may also be applied over aluminum, stainless steel, galvanizing, concrete and previously coated surfaces in addition to carbon steel.

Typical Uses

- Decks, hulls and superstructures of ships, barges and work boats.
- Piers, offshore platforms and related structures.
- Tank exteriors in oil refineries, paper mills, chemical processing facilities and waste water treatment plants.
- Tank lining.
- Industrial structural steel, machinery and piping.

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Physical Data

Finish	Flat			
Color	Khemix standard colors			
Khemix 485	See color card			
Khemix 485 PA	Oxide red, buff			
Inhibitive pigment				
Components	2			
485 / 485PA				
Curing mechanism	Solvent release and chemical reaction between components			
Volume solids (ASTM D2697 modified)	68% ± 3%			
485 / 485PA				
Dry film thickness per coat	4 to 8 mils (100 to 200 microns)			
485 / 485PA	6 to 14 mils (150 to 350 microns)			
with 880 glassflake				
Coats	1 or 2			
Theoretical coverage	ft ² /gal	m ² /L		
485 / 485PA				
1 mil (25 microns)	1090	26.7		
4 mils (100 microns)	272	6.6		
<i>485 with 880 at 6 mils (150 microns) will be 185 ft² per gallon.</i>				
VOC	lb/gal	g/L		
(EPA method 24)				
485 mixed	2.3	276		
485 mixed/thinned	2.6	311		
Temperature	Wet		Dry	
	°F	°C	°F	°C
continuous	140	60	200	93
intermittent	175	79	250	121
Flash point (SETA)	°F		°C	
485 cure	118		48	
485 resin	128		53	
K065				
K012				

Qualifications

Military Sealift Command	Underwater hulls, topside and salt water ballast tank service.
NAVSEA	Chapter 631 for aluminum hull use
USDA	Incidental Food Contact
MIL-P-23236B Type IV	Dedicated Sea Water Ballast only.
Class 2	
Grade B	

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Typical Properties

Physical

Abrasion (ASTM D4060) 1 kg load/1000 cycles CS-17 wheel	108 mg weight loss
Adhesion, Elcometer (ASTM D4541)	>1000 psi

Performance

Salt spray – 1 coat @ 6 mils 5000 hours exposure	
face corrosion (ASTM B117)	None
face blistering (ASTM B117)	None
Humidity (condensation) (ASTM D4585) 3000 hours exposure	
face corrosion	None
Steam cleanable	Yes
Chemical resistance – Condition after 1 year immersion	
caustic 30%, 50% up to 140°F	Excellent
fuel (MSC recipe)	Excellent
salt water	Excellent
DI water up to 140°F	Excellent

Khemix 485 Chemical Resistance Guide

Environment	Splash and Spillage	Fumes and Weather
Acidic	F	G
Alkaline	E	E
Solvents	E	E
Salt solutions		
Acidic	G	VG
Neutral	E	E
Alkaline	E	E
Water	E	E

F-Fair G-Good E-Excellent VG-Very Good

This chart shows typical resistance of Khemix 485 . Contact your Khemix representative for your specific requirements.

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Applied over substrates	Steel, concrete, masonry block, aluminum, galvanizing, coated surfaces
Primer/s	See Systems Table
Method	Airless, conventional spray, brush or roller
Mixing ratio (by volume)	1 part resin to 1 part cure
485 / 485PA	1-gal 880 per mixed 2-gal 485
485 with 880 glassflake	5 gal 880 per mixed 10-gal 485
Pot life (hours)	
°F/°C	90/32 70/21 50/10
485 / 485PA	1 1/2 3 5
485 with 880 glassflake	1 1/2 2 1/2 4

Environmental conditions

Temperature	°F	°C
air and surface	32 to 120	0 to 49

Surface temperatures must be at least 5°F (3°C) above dew point to prevent condensation.

Drying time (ASTM D1640) @ 6 mils, DFT (hours)

	°F/°C			
	90/32	70/21	50/10	32/0
touch	1	2	3	6
through 1	0	16	24	168
with 880 glassflake	12	18	26	192

Topcoat or recoat time

minimum	6	8	10	72
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Addition of 861 Accelerator does not change dry-to-touch or dry-through times but does accelerate cure for service.

Topcoat or recoat time

(days) (maximum)	°F/°C		
	90/32	70/21	50/10

Product			
450 Series	14	30	42
485			

non-immersion	No maximum – Clean surface required
immersion	6 months – high pressure water wash and roughen surface if exceeded

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Drying times are dependent on air and surface temperatures as well as film thickness, ventilation and relative humidity. Maximum recoating time is highly dependent upon actual surface temperatures - not simply ambient air temperatures. Surface temperatures should be monitored, especially with sun-exposed or otherwise heated surfaces. Higher surface temperatures shorten the maximum recoat window.

Time before service @ 8 mils (hours) °F/°C

485	90/32	70/21	50/10	32/0
immersion				
ambient	24	48	72	240
hot	72	168	336	NR
non-immersion	12	24	36	168

Equipment cleaner Thinner

Adhere to all application instructions, precautions, conditions and limitations to obtain the maximum performance. When used over recommended primers, refer to Application Instructions for the specific primer being used for surface preparation data and application and drying procedures. For conditions outside the requirements or limitations described, contact your representative.

Surface Preparation

Coating performance is in general, proportional to the degree of surface preparation. Abrasive blasting is usually the most effective and economical method. When this is impossible or impractical, **Khemix 485** can be applied over mechanically cleaned surfaces. All surfaces must be clean, dry and free of all contaminants, including salt deposits.

Steel – Remove all loose rust, dirt, grease or other contaminants by one of the following depending on the degree of cleanliness required: SSPC-SP2, 3, 6 or 7. For more severe service and immersion, clean to SSPC-SP10. SSPC-SP12 (WJ- 2L) is also acceptable over a previously blasted surface. The maximum soluble salt content for saltwater immersion should be 3 µg/cm². For freshwater immersion, the limit is 2 µg/cm².

For atmospheric exposure, it can be as high as 10 µg/cm². The choice of surface preparation will depend on the system selected and end-use service conditions.

Blast to achieve a dense, angular anchor profile of 1-2 mils (25-50 microns) as indicated by a Keane-Tator Surface Profile Comparator or Testex Tape. Increase coating thickness if profile greater than 3 mils.

Aluminum- Remove oil, grease or soap film with neutral detergent or emulsion cleaner or blast lightly with fine abrasive.

Galvanizing- Remove oil or soap film with neutral detergent or emulsion cleaner, then use zinc treatment such as **Khemix 163** or equivalent or blast lightly with fine abrasive.

Concrete-Acid etching (ASTM D4260) or abrasive blast (ASTM D4259) new concrete cured a minimum of 14 days.

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Aged coatings – All surfaces must be clean, dry, tightly bonded and free of all loose paint, corrosion products or chalky residue. Clean by low pressure water cleaning (1000 psi, min.), SSPC-SP1, 2, 3 or 7. **Khemix 485** is compatible over most types of properly applied and tightly adhering coatings. However, a test patch is recommended to confirm compatibility.

Repair – Prepare damaged areas to original surface preparation specifications, feathering edges of intact coating. Thoroughly remove dust or abrasive residue before touch up.

Application Equipment

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

Airless spray – Standard equipment such as Graco Bulldog or larger with a 0.15- to 0.021- in. (0.38 to 0.53 mm) fluid tip.

Conventional spray – Industrial equipment such as DeVilbiss MBC or JGA spray gun with 78 or 765 air cap and “E” fluid tip, or Binks No. 18 or 62 gun with a 66 x 63PB nozzle set up. Separate air and fluid pressure regulators, and a moisture and oil trap in the main air supply line are recommended.

Power mixer - Jiffy Mixer powered by an air or explosion-proof electric motor

Brush – Natural bristle. Maintain wet edge.

Roller – Use industrial roller. Level any air bubbles with bristle brush.

Application Procedure

Khemix 485 consists of two components which must be mixed together before use. It is packaged in the proper portions in 2- or 10-gallon units.

1. Flush equipment with thinner or **Khemix 012** before use.
2. Stir each component thoroughly, then combine resin and cure and mix until uniform.
3. Thin only if necessary for workability. Use **Khemix 065** when faster drying desired
Use only Khemix recommended thinners.
4. Do not mix more material than will be used within life. Pot life is shortened by higher temperatures.
5. For conventional spray, use adequate air pressure and volume to ensure proper atomization.
6. Apply a wet coat in even, parallel passes; overlap each pass 50 percent. If required, cross-spray at right angles to avoid holidays, bare areas and pinholes.

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Note: When applying directly over inorganic zincs or zinc-rich primers, a mist coat/full coat technique may be required to minimize bubbling. This will depend the age of the primer, surface roughness, and environmental conditions during application and curing.

7. When applying antifouling coatings, apply first antifouling coat while **Khemix 485** is still soft to thumb pressure. Failure to apply antifouling while **Khemix 485** still soft may result in poor adhesion between coatings and eventual delamination of the antifouling.
8. Normal recommended dry film thickness per coat is to 6 mils for 485. However, if greater thickness is applied in local areas because of overlapping, no runs or sags will normally occur at a dry film thickness up to 10 mils for 485. Total dry film thickness in two coats must not exceed 16 mils for 485.
9. A wet film thickness of 6 mils (150 microns) normally provides 4 mils (100 microns) of dry film.
10. When using brush or roller application method, additional coats may be required to achieve proper film thickness.
11. When a pinhole-free film is required, check film continuity of material with a nondestructive holiday detector such as Tinker and Razor Model M-1. Apply additional **Khemix 485** to areas requiring touch up.
12. Clean all equipment with thinner or **Khemix 012** immediately after use.

Safety Precautions

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 solvent 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 tank interiors and buildings

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

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

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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.

Limitation of Liability

Khemix liability on any claim of and kind, including claims based upon 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 part thereof which give rise to the claim. **In no event shall Khemix be liable for consequential or incidental damages**

Due to Khemix's policy of continuous product improvement, the information contained in this Product Data/Application Instructions sheet is subject to change without notice. It is the Buyer's responsibility to check that this issue is current prior to using the product.

Shipping Data

Packaging	2- and 10-gal units	
485	lb	kg
Shipping weight (approx.)		
485 or 485PA 2-gal unit		
cure 1 gal in 1-gal can	12	5.6
resin 1 gal in 1-gal can	13	6.0
485 5-gal unit		
cure 5 gal in 5-gal can	61	27.7
resin 5 gal in 5-gal can	60	27.3

Shelf life when stored indoors at 40 to 100°F (4 to 38°C)

cure, resin and paste 1 year from shipment date

Numerical values are subject to normal manufacturing tolerances, color and testing variances. Allow for application losses and surface irregularities. See application instructions for complete information and safety precautions. The mixed product is photochemically reactive as defined by the South Coast Air Quality Management District's Rule 102 or equivalent regulations.