Physical Properties

- Bend Test (3/4" Diam.) (ASTM D522-88) _____ 270°
- Impact Test (ASTM D2794) _____ 130 in. lbs
- Pull Off Strength (ASTM D4541) _____ 2800-3100 p.s.i.
- Hardness Test (Barcol) (ASTM D2583) _____ 78-80
- Taber Abrasion (wgt. loss) _____ 3.92 mg/1000 cycles
  CS-17, 1000 g. load, 1000 cycles (ASTM D4060-90)
- Water Absorption (30 days @ 88°F (31°C)) (ASTM D570) _____ 0.89%

Typical Properties

- Color (Normal) _____ Gray/Red
- V.O.C. Level _____ 108 grams/L (0.9 lbs. /gal).
- Lead/Chromate Content _____ Zero
- Pot Life _____ 30 minutes @ 75°F (24°C)
- Viscosity Reduction _____ Reduce with Toluene or Xylene
- Flash Point _____ 127°F (53°C)
- Solids by Volume _____ 89.6% (± 3%)
- Solids by Weight _____ 95.5% (± 2%)
- Theoretical Coverage _____ 100 sq.ft./gallon @ 12 mills DFT
  (2.9 sq.m./L @ 300 microns DFT)
- Recommended DFT _____ Average; Steel: 12 mils (300 microns)
  Concrete: 20 mils (500 microns)
- Shelf Life _____ 12 months

Application Data

Note: The following application data is provided as a **general guide only**. Only full detailed application specifications are to be used during actual application of the ChemLine® 784/32 system.

Surface Preparation

Steel:

Abrasive blast to SSPC-SP10 (NACE #2, Sa 2.5) near white metal finish. 3-4 mil (75-100 micron) blast profile.

Concrete:

Abrasive blasting is the preferred method to ensure superior bonding. However, the concrete can be prepared by slurry blasting, hydroblasting, or scarifying. The profile of the prepared concrete should be similar to that of coarse sandpaper. Use ChemLine® Primer as first coat.

Mixing Instructions

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied.

(1) Thoroughly mix the contents of Part A with a power agitator until uniform consistency and color is obtained. Be sure that any solids that may have settled through storage have been put back into suspension.

(2) Slowly combine the contents of the activator with the previously mixed Part A.

(3) Thoroughly mix the two parts until a uniform consistency and color is obtained.

Clean Up Solvent

Acetone, Xylene, Toluene

Limitations

Apply when the air and surface temperatures are above 60°F (15°C). Relative humidity must be kept at 50% or lower. The substrate temperature should be at least 5°F (-15°C) above the dew point and rising. For optimum application properties bring material to 68-77°F (20-25°C) prior to mixing and application. Increased temperatures will result in shorter pot life.

Application

Airless spray equipment with minimum 45:1 pump ratio @ 80-100 lbs. To achieve 2500-3000 p.s.i. tip pressure; Reverse-A-Clean tip .019 to .023, with 3/8" fluid hose, and 1/4" by 6' whip hose. This coating is a low VOC compliant material. If shop conditions require a viscosity adjustment, thin with Toluene or Xylene.

Recoat Time (Per Coat)

Temp. °F (°C)	Overcoat Minimum	Overcoat Maximum
60 (16)	12 Hrs.	72 Hrs
68 (20)	8 Hrs.	72 Hrs
77 (25)	8 Hrs.	48 Hrs
86 (30)	6 Hrs.	48 Hrs

Cure Time And Temperature

When application of the complete coating system has been approved, the coating can be cured by either:

A) Ambient Cure @ 75°F (24°C)
   {Concrete Application}
   To walk on - 24 hours
   To drive on - 3 days
   For Full Chemical Resistance contact the APC technical department for required time and temperatures for specific chemicals.

Note: Some chemicals will discolor surface.

B) Forced Hot Air {Tank Applications} - electrically heated air or propane or natural gas combustion heated air only.
   6 hours at minimum 180°F (82°C).

All temperatures are substrate temperatures.
Contact APC for detailed heat cure requirements.

Handling Precautions

Solvents and chemicals are contained in this product. Consult the Material Safety Data Sheet for details. Adequate safety and health precautions should be taken during handling, application and drying of this product. The material should be applied under local, state, federal regulations and in accordance with OSHA and ANSI bulletins on safety requirements.

CHEMLINE® 784/32

ChemLINE® 784/32

A History of Performance

For more than a decade ChemLine® coatings have withstood the tremendous stresses and extremes of chemical attack and abrasive wear. ChemLine® has been proven worldwide under the most arduous operating conditions, from resisting the most aggressive chemicals to handling hot pipelines in sub-freezing temperatures, with a history of success. Based on this experience, the development of ChemLine® 784/32 represents a quantum leap in chemical resistant polymer coatings.

Add to Your Profits — Specify ChemLine® 784/32

For the full story on ChemLine®, contact APC or click onto our web site at www.adv-polymer.com for the most versatile, technologically advanced and cost effective protection available.

Product covered under one or more of the following patents or patents pending. 5,169,912 5,658,996 5,874,501

ADVANCED POLYMER COATINGS

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+01 440/937-5046 Fax
800/334-7193 Toll-Free in USA & Canada

www.adv-polymer.com

ChemLINE® 784/32

Superior Chemical Resistance
High Temperature Resistance

Description

ChemLine® 784/32 delivers significantly improved product performance and anti-corrosion resistance. ChemLine® 784/32 is formulated with new patented breakthrough high functionality oxirane polymer.

Designed and engineered with 28 functional groups per molecule, this bridged aromatic backbone structure when polymerized translates into 784 crosslinks.

ChemLine® 784/32's Higher Cross-Link Density Means:

- Higher Chemical Resistance
- Higher Toughness
- Higher Heat Resistance
- Higher Resistance to Abrasion

ChemLine® 784/32 is a high functionality, two component thermoset polymer coating. When cured, ChemLine® 784/32 high cross-link density is unlike other coatings. ChemLine® 784/32 cross-links predominately through an ether (carbon-oxygen-carbon) linkage. This eliminates high concentrations of hydroxyl groups (found in epoxies) and precludes formation of ester groups (found in vinylesters) which are subject to hydrolysis and acid attack.

ChemLine® 784/32 can be ambient cured over time or low temperature forced air cured for immediate service.

ChemLine® 784/32 Provides Superior Chemical Resistance to:

- 98% Sulfuric Acid
- 37% Hydrochloric Acid
- 50% Sodium Hydroxide
- Most acids, alkalies, and solvents
- Methanol
- Methylene Chloride
- Acetic Acid

ADVANCED POLYMER COATINGS

Product Highlights

Superior Corrosion Resistance, Exceptional Toughness

- Superior bonding qualities
- Applied to pitted and/or corroded steel
- Maximum versatility; product cycling
- Ambient or low temperature force cure
- Very low VOC - 108 grams/liter (0.9 lbs. per gallon)
- Non-permeable
- Steam cleanable
- Resists hydroblasting
- Repairable
- Sunlight resistant
- Complies with FDA 21 CFR 175.300 for food handling
- High impact resistance
- Dry heat resistance to 400° F (204° C)

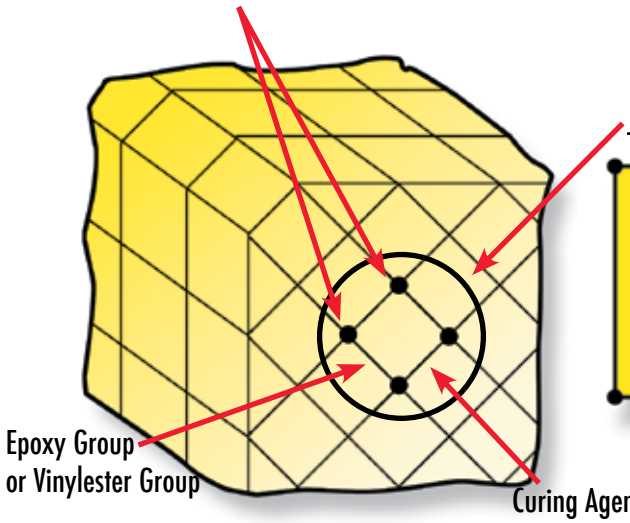
Industry Applications

- **Chemical Processing**
  Tanks, Vessels, Hazardous Waste, Secondary Containment, Chemical Plant Floors, etc.
- **Paper & Pulp**
  Digesters, Black Liquor Tanks, Bleaching, etc.
- **Mining**
  Acid Tanks, Scrubbers, etc.
- **High Technology**
  Clean Rooms, Floors, etc.
- **Power Generation**
  FGD Systems, Ducts and Stacks, etc.
- **Steel**
  Pickling Tanks, Acid Storage, Acid Waste Neutralization, etc.
- **Waste Water**
  Tanks, Clarifiers, Flocculation Basins, Neutralization Chambers, Concrete Containment, etc.

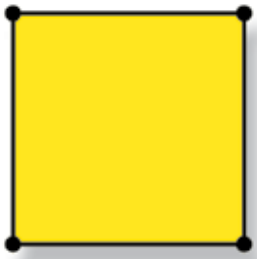
CHEMLINE® 784/32

The Technology; Epoxies, Vinylesters and ChemLine® 784/32 Form 3 Dimensional Screen-Like Structures when Cured

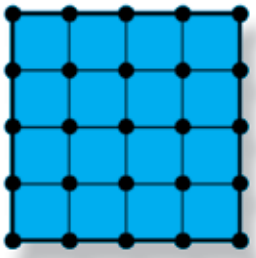
The Greater the Distance Between the Crosslinks, the Greater the Permeation Causing Chemical Attack and Absorption



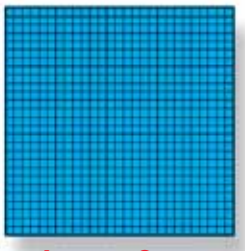
The Following 3 Diagrams Represent the Same Coating Cutaway (pictured left)



Epoxy/Vinylester
2 Functionality
Forms 4 Crosslinks



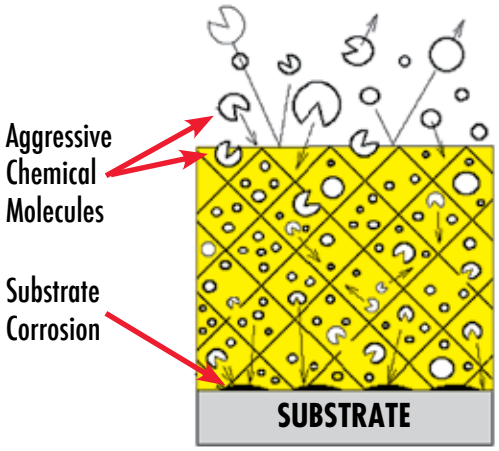
Original APC Coating
5 Functionality
Forms 25 Crosslinks



ChemLine® 784
28 Functionality
Forms 784 Crosslinks

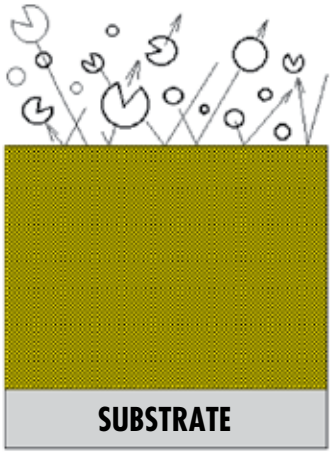
Problems with Epoxies and Vinylesters

Vinylester's and Epoxy's Open Screen Structure



AGGRESSIVE CHEMICAL MOLECULES PENETRATE INTO AND THROUGH THE POLYMER GROUPS ATTACKING BOTH THE INNER POLYMER STRUCTURE AND THE SUBSTRATE.

ChemLine 784's Closed Screen Structure



AGGRESSIVE CHEMICAL MOLECULES CANNOT PENETRATE THE HIGH DENSITY SURFACE. INNER POLYMER STRUCTURE AND SUBSTRATE PROTECTED FROM CHEMICAL ATTACK.

ChemLINE® 784/32

- **28 functionality forming 784 crosslinks**
- **Very small opening between groups**
- **Majority of crosslinks are through Ether (C-O-C) bonds. Ether bonds are one of the strongest bonds in chemistry. Ether bonds give flexibility with chemical resistance.**
- **No ester groups**

Superior Corrosion Resistance Performance

	ChemLine® 784/32	Phenol Epoxy	Vinylester	Stainless Steel
Acetaldehyde	A	L	N	A
Acetic Acid	A	N	N	A
Acrolein Acid	A	N	–	A
Acrylic Acid	A	N	N	A
Acrylonitrile	A	N	N	A
Ammonium Persulfate	A	A	A	L
Azabenzene	A	N	N	A
Benzene	A	A	N	A
Benzene Carboxylic Acid	A	A	N	A
Benzoyl Chloride	A	N	N	N
B-Methacrylic Acid	A	N	N	A
Bichromate of Soda	A	N	A	A
Bromine	A	N	N	A
Butanoic Acid	A	N	–	A
Butyric Aldehyde	A	N	A	A
Calcium Hydroxide	A	A	A	A
Calcium Hypochlorite	A	A	A	L
Caustic Potash	A	N	N	A
Carbolic Acid	A	N	N	A
Chlorine Water	A	N	A	N
Chlorosulfonic Acid	A	N	N	N
Chlorinated Acetone	A	N	N	L
Chloracetic Acid	A	N	N	L
Chromic Acid	A	N	A	N
Coal Tar Oil	A	N	A	A
Coconut Fatty Acid	A	A	A	A
Colamine	A	N	N	A
Cresol	A	N	–	A
Dichloromethane	A	N	N	A
Detergents	A	A	A	A
Diethyl Formamide	A	N	N	A
Diethylamine	A	N	N	A
Diethylene Chloride	A	N	N	L
Diethyl Ether	A	N	N	A
Dimethylamide Acetate	A	N	–	A
Disulphuric Acid	A	N	–	A
EDTA	A	N	A	A
Ethanolamine	A	N	N	A
Ethonic Acid Anhydride	A	N	–	A
Ethyl Acrylate	A	A	N	A
Fatty Acids	A	A	A	A
Fatty Acid, Palm	A	A	A	A
Ferric Chloride	A	N	A	N
Flaked Stearic Acid	A	N	A	A

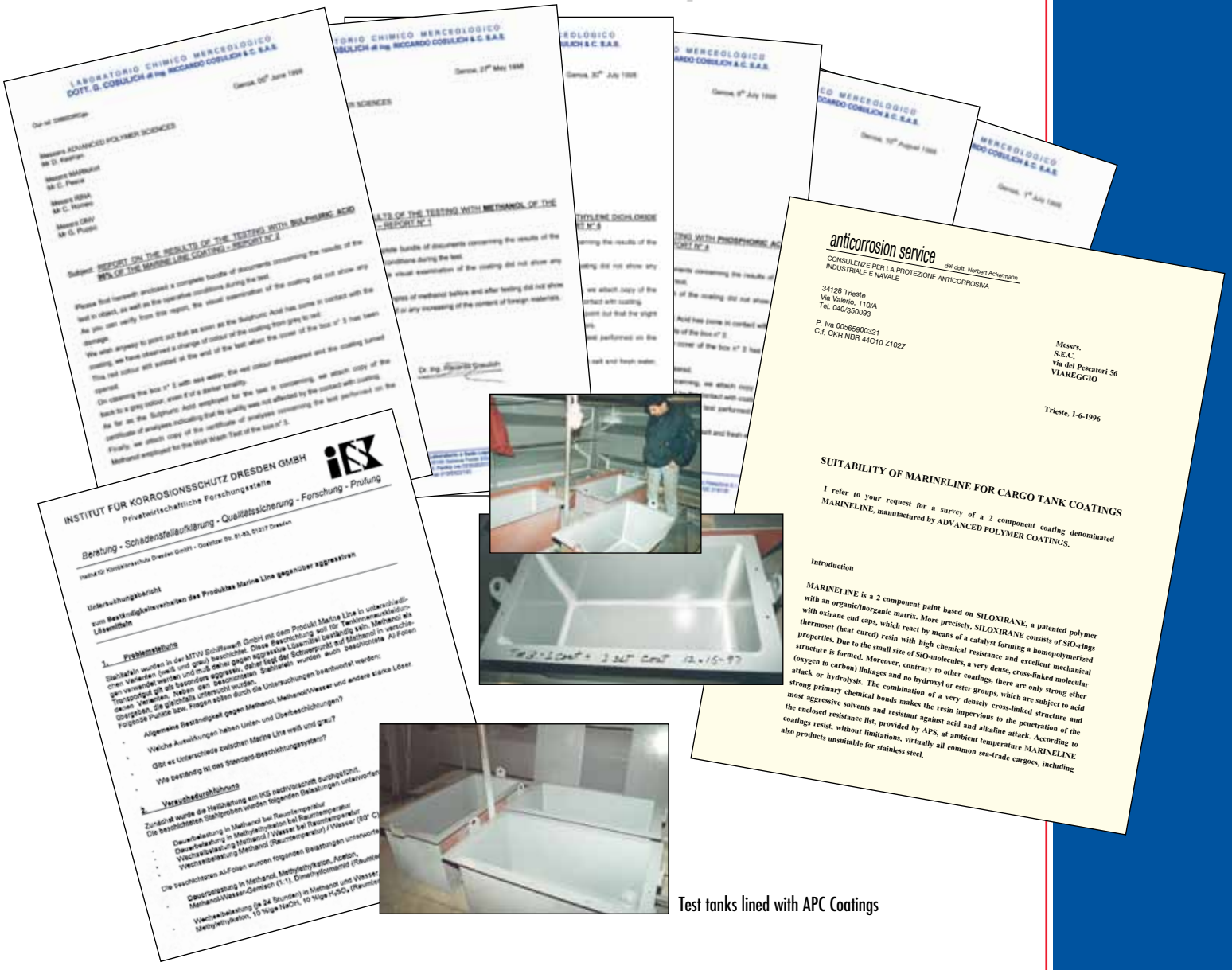
	ChemLine® 784/32	Phenol Epoxy	Vinylester	Stainless Steel
Fluoraboric Acid	A	N	–	N
Formaldehyde	A	A	A	A
Formamide	A	N	–	A
Formic Acid 10%	A	N	A	A
Green Liquor	A	N	A	L
Glycerol	A	N	N	A
Grape Juice	A	A	A	A
Grapefruit Juice	A	A	A	A
Grease Oil	A	A	A	A
Heptanoic Acid	A	A	–	A
Herring Oil	A	A	A	A
Hexahydroanaline	A	N	–	A
HMDA	A	N	–	A
Hydrazine	A	N	N	A
Hydrobromic Acid	A	N	A	N
Hydrochloric Acid	A	N	A	N
10% Hydrofluoric Acid	A	N	A	N
5-20% Hydrogen Chloride	A	N	–	N
20% Hydrogen Peroxide	A	N	A	A
10%-30% Hydrogen Sulfate	A	N	A	A
5%-12% Hypochlorite Bleach	A	N	A	N
Isobutanol	A	N	A	A
Isobutyric Acid	A	N	–	A
Isopropyl Amine	A	N	A	A
Javelle Water	A	N	A	N
Juices, Fruit	A	A	A	A
Lactic Acid	A	A	A	A
Lactonitrile	A	N	–	A
Latex	A	A	A	A
Liquified Ammonia	A	N	N	A
Liquid Pitch Oil	A	N	A	A
M-Phosphoric Acid	A	N	A	L
Maleic Anhydride	A	N	A	A
MCA	A	N	–	A
Methacrylonitrile	A	N	N	A
Methanamide	A	N	–	A
Methanol	A	N	N	A
MEK	A	L	N	A
Methylene Chloride	A	N	N	N
Monochloroacetic Acid	A	N	N	N
Monochloro Benzene	A	N	N	N
Naphtalene	A	N	A	A
Nitric Acid 1-20%	A	N	A	A
Nitro Benzene	A	A	N	A

	ChemLine® 784/32	Phenol Epoxy	Vinylester	Stainless Steel
Nitrogen Fertilizers	A	A	–	A
Norval Amine	A	N	N	A
Octanoic Acid	A	A	–	A
Orthonitro Benzene	A	N	N	N
Oleum	A	N	N	A
Olive Oil Fatty Acid	A	A	A	A
Palm Oil Fatty Acid	A	A	A	A
Perchloroethylene	A	N	N	A
Perchloric Acid	A	N	N	N
Phenol	A	N	N	A
Phosphoric Acid	A	N	A	N
Phthalic Anhydride	A	N	A	A
Piperzine	A	N	–	A
Polyethylene Polyamines	A	N	–	A
Potassium Hydroxide	A	A	L	L
Potassium Permanganate	A	A	A	L
Propionic Acid	A	N	N	A
Pyridine	A	N	N	A
Rubber Extender Oils	A	A	A	A
Rum	A	A	A	A
Sodium Carbonate	A	N	A	N
Sodium Dichromate	A	N	A	A
Sodium Hydroxide	A	A	A	L
Sodium Hypochlorite	A	N	A	N
Sodium Sulfide	A	A	N	N
Stannic Chloride	A	A	A	N
Stearic Acid	A	A	A	A
Spent Sulfuric Acid	A	N	N	A
Sulfur	A	N	N	A
Sulfuric Acid 1-70%	A	A	A	N
Sulfuric Acid 70-99%	A	N	N	L
Sulphurous Acid	A	N	N	A
Tall Oil	A	A	A	A
Tallow Acid	A	A	N	A
Tar Acid	A	N	A	A
Tetra Chloroacetic Acid	A	N	N	N
Tetra Hydrofurfuryl Alcohol	A	N	N	A
Toluene Diamine	A	N	N	A
Toluol	A	L	L	A
Valeraldehyde	A	N	–	A
Vinegar	A	N	A	A
Vitriol Oil 65%	A	N	A	A
Water, Acid	A	N	N	A
Xylenol	A	N	N	A

A = Good at ambient temperatures L = Limited Service N = Not recommended

Corrosion resistance data for Epoxy, Vinylester and Stainless Steel from published literature.

Worldwide Independent Test Laboratories Certify APC Coatings MarineLine® 784 and ChemLine® 784 Corrosion Resistance and Non-Absorption Qualities



Test tanks lined with APC Coatings

Resistance Comparison to the Top 131 Chemicals Manufactured