

# ChemLINE<sup>®</sup> 784/31

## Superior Chemical Resistance High Temperature Resistance

### Description

ChemLine<sup>®</sup> 784/31 delivers significantly improved product performance and anti-corrosion resistance. ChemLine<sup>®</sup> 784/31 is formulated with new, patented breakthrough polymer technology, designed and engineered with 28 functional groups per molecule. This translates into 784 crosslinks versus four (4) for high temperature epoxies.

### ChemLine<sup>®</sup> 784/31's Higher Cross-Link Density Means:

- Higher Chemical Resistance
- Higher Temperature Resistance
- Higher Reactivity at Lower Temperature
- Higher Resistance to Absorption
- Higher Toughness

ChemLine<sup>®</sup> 784/31 is heat force cured. When cured, ChemLine<sup>®</sup> 784/31's high functionality delivers an extremely dense cross-linked molecular structure. Unlike other coatings, ChemLine<sup>®</sup> 784/31 cross-links 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.

### Industry Applications

- **Chemical Processing** - Tanks, Reactor Vessels, Hazardous Waste Hauling, etc.
- **Paper & Pulp** - Digesters, Black Liquor Tanks, Bleaching, etc.
- **Steel** - Pickling Tanks, Acid Storage, Acid Waste, Neutralization, etc.
- **Mining** - Acid Tanks, Scrubbers, etc.

### Product Highlights

- Superior bond strength and adhesion
- Maximum product flexibility, product cycling
- Repairable
- Very low VOC - 108 grams/liter
- Can be applied to pitted and/or corroded steel
- Steam cleanable
- Complies with FDA 21CFR 175.300
- Non-permeable for product purity

### More Chemical Resistance than:

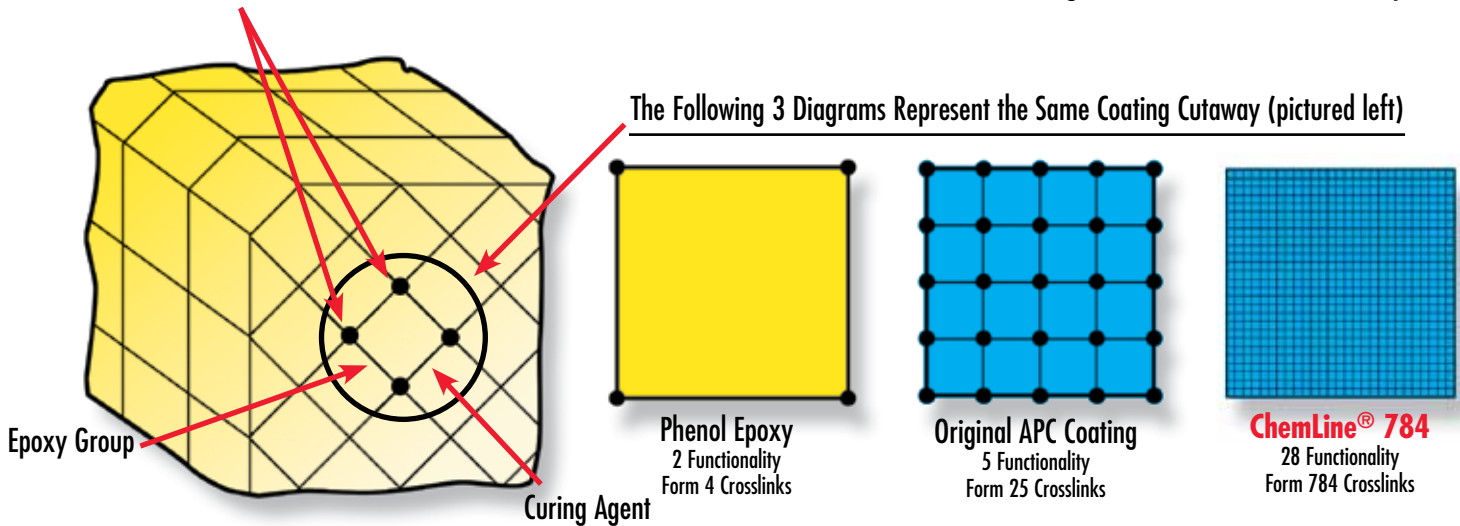
- Stainless Steel
- Phenol Epoxies
- Vinylesters
- Phenolic

### ChemLine<sup>®</sup> 784/31 Provides Superior Resistance To:

- Acids, Alkalis and Solvents
- Thermal Shock -40°F to 400°F (-40°C to +204°C)
- Flex Stressing
- Wear and Abrasion
- Product Absorption
- Impact
- Under-Creep Corrosion
- Dry Heat Resistance to 500°F (260°C)

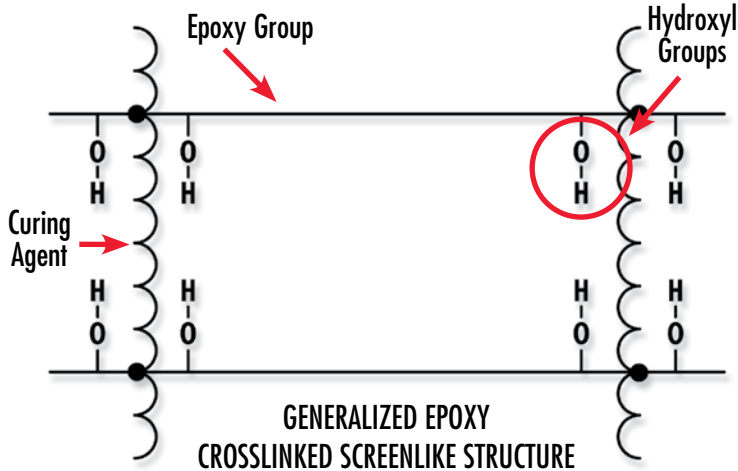
# The Technology; Epoxies, Vinylesters and ChemLine® 784/31 Form 3 Dimensional Screen-Like Structures when Cured

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



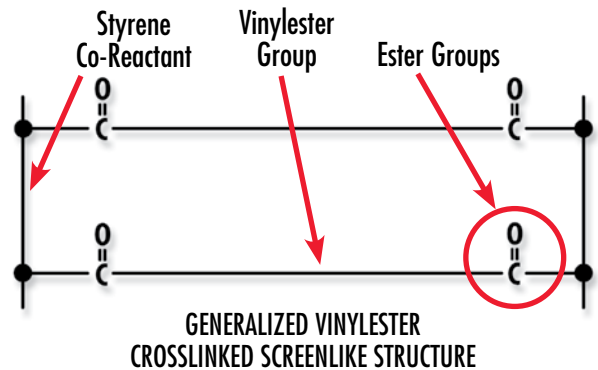
## Problems with Epoxies

- Only 2 functionality
- Large opening between epoxy groups allowing penetration
- High concentration of Hydroxyl (OH) groups allowing attack by acids and solvents



## Problems with Vinylesters

- Only 2 functionality
- Slightly smaller opening between vinylester groups than epoxies, still allows penetration
- High concentration of Ester ( $\text{O}^{\ominus}$ ) groups allowing attack by solvents and alkalis



## ChemLINE® 784/31

- 28 functionality forming 784 crosslinks
- Almost no opening between groups
- No Hydroxyl groups
- No Ester groups
- Crosslinking through Ether (C-O-C) groups only. Ether bonds one of the strongest bonds in chemistry. Ether bonds give flexibility with chemical resistance.

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## Physical Properties

- Bend Test (3/4" Diam.) (ASTM D522-88) \_\_\_\_\_ 270°
- Impact Test (ASTM D2794) \_\_\_\_\_ 140 in. lbs
- Pull Off Strength (ASTM D4541) \_\_\_\_\_ 2800-3100 p.s.i.
- Hardness Test (Barcol) (ASTM D2583) \_\_\_\_\_ 75-80
- 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%

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## Typical Properties

- Color (Normal) \_\_\_\_\_ Gray/Red
- V.O.C. Level \_\_\_\_\_ 108 grams/L (0.9 lbs. /gal).
- Lead/Chromate Content \_\_\_\_\_ Zero
- Pot Life \_\_\_\_\_ 120 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./gal. @12 mils  
(2.9 m<sup>2</sup>/L @ 300 microns)
- Recommended DFT \_\_\_\_\_ Average; Steel: 300 microns (12 mils)
- Shelf Life \_\_\_\_\_ 12 months

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## 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® 784/31 system.

### Surface Preparation

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

### 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 in 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, Toluene, Xylene

### Limitations

Apply when the air and surface temperatures are above 60°F (15°C). Surface temperatures must be at least 5°F (-15°C) above the dew point. Relative humidity must be kept at 50% or lower. For optimum application properties, bring material to 70-90°F (21-32°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, 1/4" by 6' whip hose, with a maximum of 100 linear feet. This coating is a low VOC compliant material. If shop conditions require a viscosity adjustment, thin with Xylene or Toluene.

### Cure Time And Temperature

Forced Hot Air - electrically heated air or propane or natural gas combustion heated air only.  
6 hours at minimum 250°F (122°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<sup>®</sup> 784/31



## **A History of Performance**

For more than two decades ChemLine<sup>®</sup> coatings have withstood the tremendous stresses and extremes of chemical attack and abrasive wear. ChemLine<sup>®</sup> 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<sup>®</sup> 784/31 represents a quantum leap in chemical resistant polymer coatings.

## **Add to Your Profits — Specify ChemLine<sup>®</sup> 784/31**

For the full story on ChemLine<sup>®</sup>, contact APC or click onto our web site at [www.adv-polymer.com](http://www.adv-polymer.com) for the most versatile, technologically advanced and cost effective protection available.

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



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