

# 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 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 784/31 crosslinks 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:

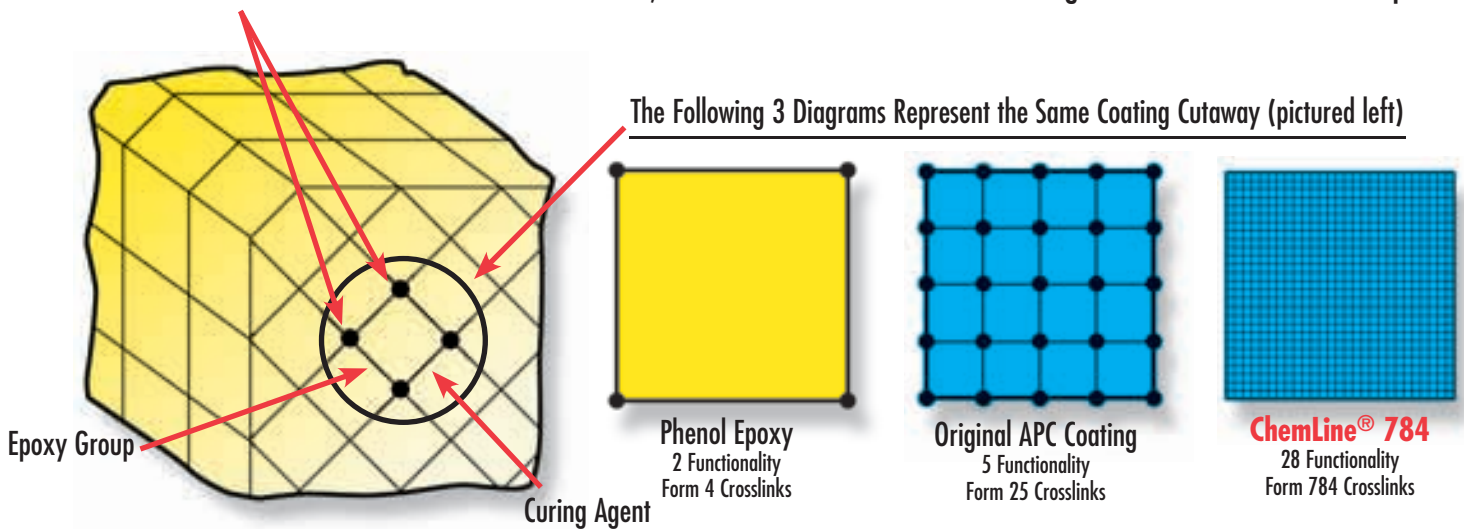
- Stainless Steel
- Phenol Epoxies
- Vinylesters
- Phenolic

### 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)

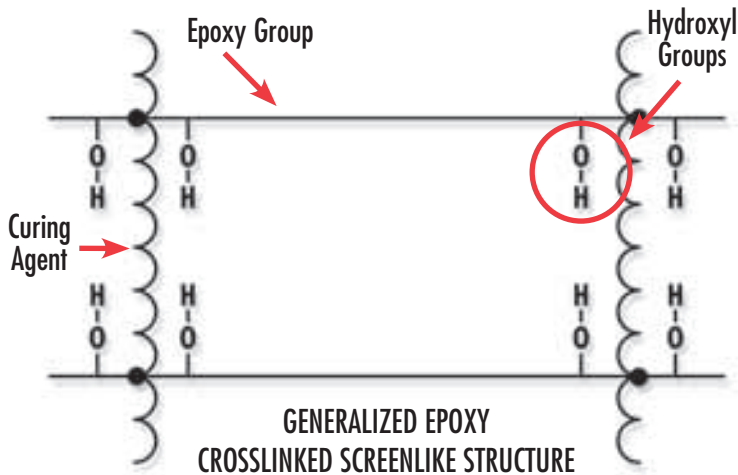
# The Technology; Epoxies, Vinylesters and ChemLine® 784/31 Form 3 Dimensional Screen-Like Structures when Cured

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



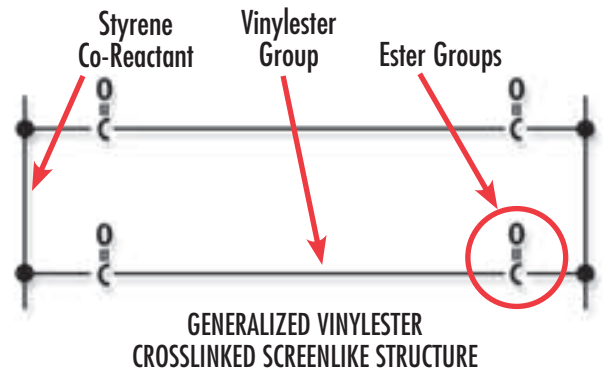
## Problems with Epoxies

- 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 ( $\text{C}=\text{O}$ ) groups allowing attack by solvents and alkalis



# ChemLINE® 784/31

- 28 functionality
- 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.

## 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) CS-17, 1000 g. load, 1000 cycles (ASTM D4060-90)	3.92 mg/1000 cycles
■ 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	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	2.9 m <sup>2</sup> /L @ 300 microns (120 sq. ft./gal. @12 mils)
■ Recommended DFT	Average; Steel: 300 microns(12 mils)
■ 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® 784/31 system.

### Surface Preparation

Grit blast to SSPC-SP5 (Nace #1, SA3) White Metal finish. Three to four mil (75-100 micron) blast profile desired.

### 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.**

### Coverage

Practical at recommended film thickness (12-14 mils DFT) - 75-80 square feet per gallon.

### 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 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 784/31 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, 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.

The furnishing of the information contained herein does not constitute a representation by Advanced Polymer Coatings (APC) that any product or process is free from patent infringement claims of any third party, nor does it constitute the grant of a license under any patent of APC or any third party. APC assumes no liability for any infringement which may arise out of the use of the product. APC warrants that its products meet the specifications which it set for them. APC DISCLAIMS ALL OTHER WARRANTIES and relating to the products and DISCLAIMS ALL WARRANTIES RELATING TO THEIR APPLICATION expressed or implied INCLUDING but not limited to warranties of MERCHANT ABILITY AND FITNESS for particular purpose. Receipt

of products from APC constitutes acceptance of the terms of the Warranty; contrary provisions of purchase orders not withstanding. In the event that APC finds that products delivered are off-specification, APC will at its sole discretion, either replace the products or refund the purchase price thereof. APC's choice of one of these remedies shall be Buyer's sole remedy. APC will under no circumstances be libeled upon for consequential damages except in so far as liability is mandated by law. APC will deliver products at agreed upon times in so far as it is reasonably able to do so, but APC shall not be liable for failure to deliver on time when the failure is beyond its reasonable control.

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

Avon Ohio 44011 U.S.A.

440/937-6218 Phone

440/937-5046 Fax

800/334-7193 Toll-Free in USA & Canada

© Copyright 2009

[www.adv-polymer.com](http://www.adv-polymer.com)

CHEMLINE<sup>®</sup> 784/31