

ChemLINE[®]

*High performance industrial coatings for
aggressive applications.*



ADVANCED
POLYMER COATINGS

▶ ChemLine® Presents a History of Performance

ChemLine® coatings from Advanced Polymer Coatings provide high performance corrosion protection. They are engineered using unique polymer technology to deliver excellent resistance to a wide range of aggressive chemicals.

ChemLine® coatings offer outstanding features and benefits, which can include:

- ▶ Resistance to aggressive chemical exposures, including strong acids, alkalis, gases, solvents and oxidizers
- ▶ Superior bond strength and adhesion to metal substrates, composites and concrete
- ▶ Virtually non permeable film minimizing cargo absorption and assuring content purity
- ▶ Wear and abrasion resistance
- ▶ Impact resistance
- ▶ Outstanding flexibility
- ▶ Steam cleanable
- ▶ Field repairable
- ▶ Complies with all FDA regulations
- ▶ High temperature resistance up to 500°F (260°C)
- ▶ Thermal cycling resistance -40° to +400°F (-40° to 204°C)
- ▶ Resists hydroblasting
- ▶ Excellent conductive / static dissipating properties
- ▶ Low surface tension
- ▶ ChemLine® is generally recognized as safe (GRAS) for food grade cargoes.

For product recommendations and technical, application and heat curing information contact Advanced Polymer Coatings' customer service.



▶ ChemLine® Serves a Range of Industrial Markets

PETROLEUM & REFINING



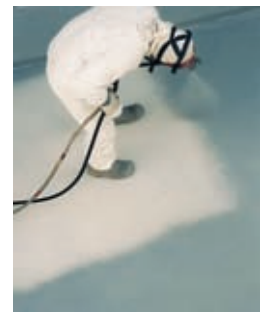
ChemLine® coatings provide superior protection and corrosion resistance throughout petroleum production and refining facilities. Even at elevated temperatures, ChemLine® coatings deliver an impermeable lining system that resists chemical and corrosive attacks.



TANK STORAGE & TERMINALS



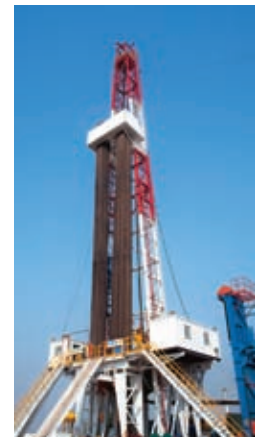
At storage facilities, ChemLine® protects tanks against aggressive acids, alkalis, solvents, CPPs, and edible oils, even at elevated temperatures. ChemLine® polymer coatings are 97% solids with extremely low VOCs, making them the preferred lining system for bulk chemical storage tanks.



PIPELINE



ChemLine® coatings are used to line the insides of pipes exposed to corrosive service conditions in oil exploration drilling. Durable ChemLine® coatings handle aggressive fracking chemicals and acids, high pressure gasses, high abrasion service, and high temperatures.



▶ ChemLine® Provides Enhanced Corrosion Protection

TRUCK TRANSPORTATION

ChemLine® coatings provide advanced tank coating protection for over-the-road vehicles. ChemLine®'s unique cross-linked polymer structure does not allow a chemical cargo to permeate the lining, thus providing corrosion resistance while ensuring product purity.

*Photos provided courtesy of Resistaline, Chicago, IL



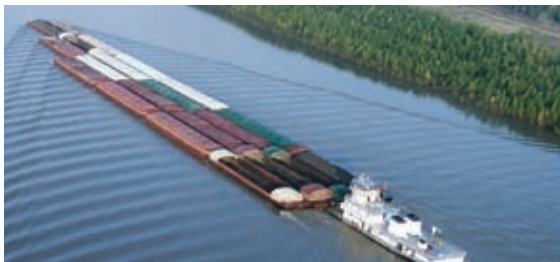
RAIL TRANSPORTATION

ChemLine® coatings provide superior chemical resistance for tank and hopper cars. The coating's superior chemical resistance to thousands of chemicals provides lessors with the flexibility to change cargoes after simple cleaning and decontamination, with assurance of cargo purity.



BARGE AND INLAND MARINE

ChemLine® coatings have the unique ability to handle more than 5,000 chemicals including the full IBC range, hazardous cargoes, food grades, edible oils, fatty acids, black oils, solvents, spent acids, caustics and biodiesel fuels.





POWER GENERATION

Durable ChemLine® coatings are specified to handle aggressive applications at power plants such as flue gas desulfurization systems and scrubbers, stacks, linings, ducts, chimneys, spray towers and fans. ChemLine® delivers chemical resistance and high heat capability to 500°F (260°C).



TANK (ISO) CONTAINERS

APC offers high performance ChemLine® coatings for tank lining applications including tank containers (ISO tanks), intermediate bulk containers (IBCs), and bulk storage tanks, depending on specific needs of the product tanker container owner or transport manager.



CHEMICAL PROCESSING

At chemical plants facilities, ChemLine® offers optimal protection against acids, caustics and solvents. Wherever hazardous chemicals pose problems – tanks, pipes, stacks, digesters, and in or around processing equipment – ChemLine® delivers superior long-term service.



Superior Corrosion Resistance Performance

This is Only A Reference Guide

Contact your ChemLine® Representative or the ChemLine® Customer Service Hotline +01 440-937-6218 for detailed specifications prior to any final coatings recommendation or application.

	ChemLine®	Phenolic 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®	Phenolic 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
Hexahydroaniline	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

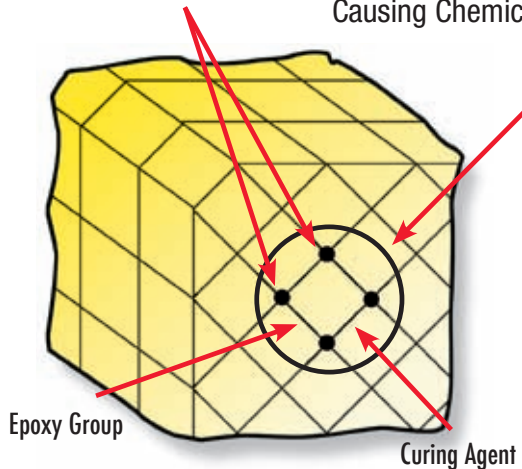
	ChemLine®	Phenolic Epoxy	Vinylester	Stainless Steel
Nitrogen Fertilizers	A	A	—	A
Norval Amine	A	N	N	A
Octanoic Acid	A	A	—	A
Orthonitro Benzene	A	N	N	N
Oleum	A	N	N	A
Olive Oil Fatty Acid	A	A	A	A
Palm Oil Fatty Acid	A	A	A	A
Perchloroethylene	A	N	N	A
Perchloric Acid	A	N	N	N
Phenol	A	N	N	A
Phosphoric Acid	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

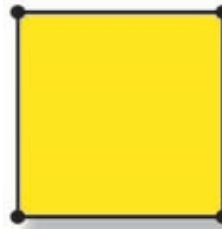
Corrosion resistance data for Phenolic Epoxy, Vinylester and Stainless Steel from published literature.

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

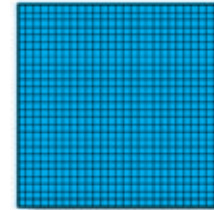
The Greater the Distance Between the Crosslinks, the Greater the Permeation Causing Chemical Attack and Absorption



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



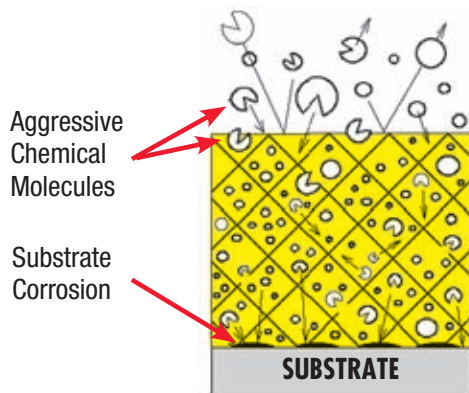
Epoxy
2 Functionality
Forms 4 Cross-links



ChemLine® 784
28 Functionality
Forms up to 784 Cross-links,
the Highest Cross-link Density

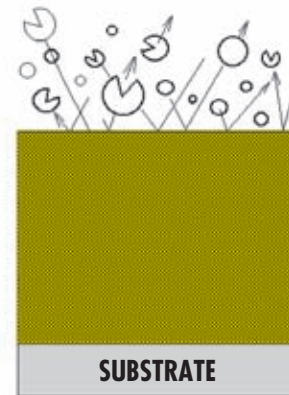
Problems with Epoxies and Vinylesters

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 up to 784 crosslinks.
- ▶ 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 hydroxyl or ester groups which are subject to hydrolysis and chemical attack.

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+01 440-937-6218 for detailed specifications prior to any final coatings recommendation or application.

PRODUCT NAME	TEMP RATING	CURE SCHEDULE**	APPLICATION METHOD	SYSTEM DFT	TYPICAL APPLICATIONS	FEATURES & BENEFITS
ChemLine® 784/32 784/32 EF 784/32 PC	-40°F to +400°F (-40°C to 204°C)	200°F to 300°F (6 hours) (93°C - 149°C)	SP,BR,RL,PC	12-14 mils (steel)	Reactors, chemical storage tanks, scrubbers, piping, ducts, rail cars, ISO tanks, OTR tankers, & barges	* GRAS recognized. Excellent chemical resistance. Low temperature cure.
	-40°F to +400°F (-40°C to 204°C)	Ambient ** (9-14 days)	SP,BR,RL,PC	12-14 mils (steel) 20-24 mils (concrete)	Secondary containment, clean rooms, structural steel, manhole covers/ vaults, floors	Ambient cure. Excellent chemical resistance.
ChemLine® 784/31	-40°F to +500°F (-40°C to 260°C)	250°F to 350°F (6 hours) (121°C - 177°C)	SP,BR,RL	12-14 mils (steel)	Tanks, pipes, & scrubbers	High temperature resistance. Best chemical resistance at high temperature.
ChemLine® 2400/32	-40°F to +400°F (-40°C to 204°C)	200°F to 300°F (6 hours) (93°C - 149°C)	SP,BR,RL	16-18 mils (steel)	Slurry tanks, scrubbers, dump trucks, bag houses, FGD units, tank containers, hopper cars, & ion exchange vessels	Outstanding abrasion resistance. Excellent chemical resistance. Low temperature cure.
	-40°F to +300°F (-40°C to 148°C)	Ambient** (9-14 days)	SP,BR,RL	24-26 mils (concrete)	Slurry tanks, pipes, secondary containment, sumps, trenches, pits, & clarifiers	Ambient cure. Outstanding abrasion resistance. Excellent chemical resistance.
ChemLine® 2400/31	-40°F to +500°F (-40°C to 260°C)	250°F to 350°F (6 hours) (121°C - 177°C)	SP,BR,RL	12-14 mils (steel)	Tanks, pipes, & scrubbers	High temperature resistance. Best chemical resistance at high temperature.
ChemLine® LE	-40°F to +500°F (-40°C to 260°C)	250°F to 350°F (6 hours) (121°C - 177°C)	SP,BR,RL	12-14 mils (steel)	Stacks, ducts, heat exchangers, pressure vessels, FGD systems, bag houses, & scrubbers	High temperature resistance. Best chemical resistance at high temperature. Excellent CTE match with steel.
ChemLine® AS	-40°F to +400°F (-40°C to 204°C)	200°F to 300°F (6 hours) (93°C - 149°C)	SP,BR,RL	12-14 mils (steel)	Ducts, structural steel	Excellent conductive and static dissipative properties. Excellent chemical resistance.
	-40°F to +400°F (-40°C to 204°C)	Ambient** (9-14 days)	SP,BR,RL	12-14 mils (steel) 20-24 mils (concrete)	Solvent rooms, clean rooms, munitions storage/manufacturing, paint mix kitchens	Excellent conductive and static dissipative properties. Excellent chemical resistance.
ChemLine® TDC	-40°F to +500°F (-40°C to 260°C)	200°F to 400°F (3-6 hours) (93°C - 204°C)	SP	30-60 mils (steel)	HOT steel structures, steam pipes	Temperature dissipating coating for hot steel surfaces where heat can cause injury.
ChemLine® Primer	-40°F to 200°F (-40°C to 93°C)	Ambient** (9-14 days)	SP,BR,RL	3-4 mils (concrete)	Secondary containment tanks	Superior bonding & sealing properties.
ChemLine® Caulk	-40°F to +212°F (-40°C to 100°C)	Ambient** (9-14 days)	Trowel	See data sheet	Covings, cracks, & joints	Excellent chemical resistance & flexibility. (Pre-measured quart kits).
ChemLine® Putty	-40°F to +250°F (-40°C to 121°C)	Ambient to 300°F (149°C)	Trowel	See data sheet	Pitted steel & chime areas	Excellent chemical resistance & flexibility. (Pre-measured quart kits).

Key SP= Spray Application BR= Brush Application RL= Roller Application PC= Plural Component

NOTE- The Roller and Brush application is NOT a preferred application to use on steel; only use for repair or stripe coating.

*ChemLine® is generally recognized as safe (GRAS) for food grade cargoes. ChemLine® coating complies with the FDA and all applicable food additive regulations.

**For concrete and other non-immersion applications.

"Performance Without Compromise"

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