

# ECM Duro-Bond PVDF Lining

## Description

**Duro-Bond PVDF** is a laminated sheet lining consisting of a layer of polyvinylidene fluoride (PVDF) resin laminated onto a layer of fabric cloth or vulcanized chloroprene rubber backing that is readily bonded to steel, concrete, or FRP substrates. PVDF is a partially fluorinated thermoplastic resin that is melt flow processible. **Duro-Bond PVDF sheet lining is available in thicknesses of 60 mils (1.5 mm), 90 mils (2.3 mm) and 118 mils (3.0 mm).**

## Uses

**Duro-Bond PVDF** is used as a vessel lining material where severe corrosion conditions are present. Typical applications include towers, scrubbers, process vessels and high purity acid and ultra pure water equipment.

In addition to providing high purity and corrosion resistance, **Duro-Bond PVDF** also resists the effects of abrasion and high temperatures. Because of its unique combination of properties, great strength, superior chemical, corrosion, and abrasion resistance, and a wide temperature range, **Duro-Bond PVDF** is frequently the most cost-effective material of choice for corrosion control and high purity in the chemical, semiconductor, transportation, pharmaceutical, metals, food, paper and electric power industries.

## Advantages

**Duro-Bond PVDF** is noted for its good resistance to organic and inorganic acids, aliphatic and aromatic hydrocarbons, alcohols and certain halogenated, e.g. chlorinated solvents. It is not attacked by the halogens except nascent chlorine.

PVDF is non-toxic and may be used according to the Food and Drug Administration for food packing and for food contact use.

**Duro-Bond PVDF** can be bonded to various substrates and can be installed by experienced technicians in the shop or in the field.

Among its other outstanding characteristics are high natural mechanical strength, high dielectric strength, excellent abrasion and stain resistance, and good thermal stability at both reduced and elevated temperatures.

## Service Temperature

PVDF is known for its resistance to halogens, petrochemicals, and most acids and bases in a temperature range from -60 ° C to 145 ° C (-80 ° F to 290 ° F). When bonded to a substrate, the maximum recommended service temperature for **Duro-Bond PVDF** sheet lining is 110 ° C (230 ° F) on a continuous basis, 120 ° C (250 ° F) on an intermittent basis.

## Chemical Resistance

The information listed may be considered as a basis for recommendation, but not as a guarantee, unless sold and installed by **ELECTRO CHEMICAL MANUFACTURING**. For resistance of **Duro-Bond PVDF** to chemicals not listed, contact us at 330-313-6372, [knightmaterials.com](http://knightmaterials.com), or [info@knightmaterials.com](mailto:info@knightmaterials.com).

Electro Chemical Manufacturing Duro-Bond PVDF Lining

**Key to Rating:**

1 - Little or no effect

2 - Some effect, but not indicative of impaired serviceability

3 - Noticeable effect, although possible serviceability

NR - Not Recommended.

BLANK - Information has not been determined.

<u>Chemical</u>	<u>70°F</u>	<u>120°F</u>	<u>150°F</u>	<u>212°F</u>	<u>225°F</u>
Acetic Acid (Glacial)	2	2	3	3	NR
Acetic Acid (50% H2O)	2	2	3	3	NR
Acetic Anhydride	2	3	NR	-	-
Acetone	3	NR	-	-	-
Acetone 10%	1	1	2	-	-
Acetone (50% H2O)	2	2	3	-	-
Acetonitrile	1	1	2	-	-
Acetophenone	3	3	3	NR	-
Acetylchloride	1	2	3	NR	-
Acetylene	1	1	1	1	1
Acrylic Acid	1	1	2	-	-
Acrylonitrile	1	2	-	-	-
Allyl Chloride	1	1	1	1	2
Aluminum Ammonium Sulfate	1	1	1	1	1
Aluminum Chloride*	1	1	1	1	1
Aluminum Fluoride	1	1	1	1	1
Aluminum Hydroxide	1	1	1	1	-
Aluminum Nitrate	1	1	1	1	-
Aluminum Potassium Sulfate	1	1	1	1	1
Amino Triazole	NR	-	-	-	-
Ammonia (Anhydrous)	3	NR	-	-	-
Ammonia Aqua (30%) NH3	1	1	1	1	-
Ammonium Bifluoride	1	1	1	1	1
Ammonium Carbonate	1	1	1	1	1
Ammonium Chloride	1	1	1	1	1
Ammonium Fluoride (25%)	1	1	1	1	-
Ammonium Hydroxide (30%)	1	1	1	2	-
Ammonium Nitrate	1	1	1	1	1
Ammonium Phosphate	1	1	1	1	1
Ammonium Sulfate	1	1	1	1	1
Ammonium Sulfide	1	1	1	1	1
Amyl Acetate	1	1	2	3	NR
Amyl Alcohol	1	1	1	1	1
Amyl Chloride	1	1	1	1	1
Aniline or Aminobenzene	2	2	2	3	-
Antimony Pentachloride	NR	-	-	-	-
Antimony Trichloride	1	-	-	-	-
Aqua Regia	1	-	-	-	-
Arsenic Acid	1	1	1	-	-
Atrozine (Herbicide)	NR	-	-	-	-
Barium Carbonate	1	1	1	1	1
Barium Chloride	1	1	1	1	1
Barium Hydroxide	1	1	1	1	1
Barium Sulfide	1	1	1	1	1
Benzaldehyde	1	2	-	-	-

\* Not recommended in anhydrous conditions as in "Friedel-Crafts" and alkylation type reactions.

Electro Chemical Manufacturing Duro-Bond PVDF Lining

<u>Chemical</u>	<u>70°F</u>	<u>120°F</u>	<u>150°F</u>	<u>212°F</u>	<u>225°F</u>
Benzene	1	1	1	2	3
Benzene Sulfonic Acid	1	1	2	3	3
Benzoic Acid	1	1	1	1	1
Benzyl Alcohol	1	1	1	1	1
Benzyl Chloride	1	1	1	1	1
Benzoyl Chloride	1	2	3	NR	-
Benzoyl Peroxide	1	1	1	2	3
Black Liquor	1	1	1	1	1
Borax	1	1	1	1	1
Boric Acid	1	1	1	1	1
Boron Tribromide	1	1	1	2	-
Brine	1	1	1	1	1
Bromic Acid	1	1	1	1	1
Bromine (Dry)	1	1	1	-	-
Bromine Liquid	1	1	1	2	3
Bromine Water	1	1	1	1	-
Butadiene	1	1	1	1	1
Butyl Acetate	1	2	3	NR	-
Butyl Acrylate	1	2	3	NR	-
n-Butyl Alcohol	1	1	1	1	1
sec-Butyl Alcohol	1	1	1	1	1
tert-Butyl Alcohol	1	1	1	1	1
n-Butylamine	2	NR	-	-	-
sec-Butylamine	1	2	3	NR	-
tert-Butylamine	1	2	2	3	-
Butylene	1	1	1	1	1
Butyl Bromide	1	1	1	1	1
Butyl Chloride	1	1	1	1	1
Butyl Phenol	1	1	1	1	-
Butyric Acid	1	1	1	1	1
n-Butyl Mercaptan	1	1	1	1	1
Calcium Phosphate	1	1	1	1	1
Calcium Bisulfate	1	1	1	1	1
Calcium Bisulfide	1	1	1	1	1
Calcium Carbonate	1	1	1	1	1
Calcium Chlorate	1	1	1	1	1
Calcium Chloride	1	1	1	1	1
Calcium Hydroxide	1	1	1	1	1
Calcium Hypochlorite	1	1	1	1	1
Calcium Nitrate	1	1	1	1	1
Calcium Sulfate	1	1	1	1	1
Caprylic Acid	1	1	1	2	-
Carbitol	1	1	1	2	-
Carbon Dioxide (Wet)	1	1	1	1	1
Carbon Dioxide (Dry)	1	1	1	1	1
Carbon Disulfide	1	-	-	-	-
Carbon Tetrachloride	1	1	1	1	1
Caster Oil	1	1	1	1	1
Cellosolve	1	1	1	1	1
Chlorine (Dry Gas)	1	1	1	1	-
Chlorine (Wet Gas)	1	1	1	1	-

Electro Chemical Manufacturing Duro-Bond PVDF Lining

Chlorine Dioxide (15%)	1	1	1	1	2
Chlorine, Liquid	1	1	1	1	2
Chlorine Water	1	1	1	1	-
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Chlorine (5% in CCl4)	1	1	1	1	-
Chloroacetic Acid (50% H2O)	2	2	3	NR	NR
Chlorobenzene	1	1	1	2	3
Chloroform	1	1	1	1	2
Chlorosulfonic Acid	3	NR	-	-	-
Chromic Acid (50%)	1	1	1	2	3
Citric Acid	1	1	1	1	-
Coconut Oil	1	1	1	1	-
Chromyl Chloride	1	1	-	-	-
Coal Gas	1	1	1	1	-
Copper Chloride	1	1	1	1	1
Copper Cyanide	1	1	1	1	1
Copper Fluoride	1	1	1	1	1
Copper Nitrate	1	1	1	1	1
Copper Sulfate	1	1	1	1	1
Corn Oil	1	1	1	1	1
Cottonseed Oil	1	1	1	1	1
Cresol	1	1	1	2	-
Cresylic Acid	1	1	1	2	-
Crotonaldehyde	1	1	2	3	-
Crude Oil	1	1	1	1	-
Cyclohexane	1	1	-1	1	1
Cyclohexanol	1	1	1	2	-
Cyclohexanone	1	3	3	NR	NR
Dimethylformamide	2	3	NR	-	-
Dextrin	1	1	1	1	1
Diacetone Alcohol	1	2	3	NR	-
Dibromopropanol	1	1	-	-	-
Dichloroethane	1	1	1	2	-
Dichloroethylene	1	1	1	2	-
Diesel Fuels	1	1	1	1	1
Diethylamine	1	3	3	-	-
Diethyl Carbonate	1	1	2	3	-
Diethyl Cellosolve	1	1	1	1	1
Diethylene Glycol Monoethyl Ether	1	1	1	2	-
Diethyl Ether	1	2	-	-	-
Diethylene Triamine	1	1	2	3	-
Diglycolic Acid	1	-	-	-	-
Diisobutyl Keton	1	1	1	1	-
Diisobutylene	1	1	1	1	1
Dimethylamine	2	3	3	3	-
Dimethyl Formamide	3	3	NR	-	-
Dimethylaniline	1	2	3	3	NR
Dimethyl Phthalate	1	2	3	NR	-
Dimethyl Sulfate	NR	-	-	-	-
p-Dioxane	3	3	NR	-	-
Dodecylbenzene Sulfonic Acid	1	1	1	-	-
Epichlorohydrin	3	NR	-	-	-
Ether	1	2	-	-	-
Ethyl Acetate	3	3	NR	-	-
Ethyl Alcohol	1	1	1	1	1
Ethyl Ether	1	1	2	3	NR

Electro Chemical Manufacturing Duro-Bond PVDF Lining

Esters	1	2	3	NR	-
Ethylacetoacetate	1	2	3	NR	-
Ethyl Acrylate	1	2	3	NR	-
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Ethyl Chloride	1	1	1	1	1
Ethylene Bromide	1	1	1	1	1
Ethylene Chloride	1	1	1	1	1
Ethylene Chlorohydrin	1	2	3	NR	-
Ethylene Diamine	2	NR	-	-	-
Ethylene Dibromide	1	1	1	1	1
Ethylene Dichloride	1	1	1	2	-
Ethylene Glycol	1	1	1	1	1
Ethylene Oxide	1	1	1	1	2
Fatty Acids	1	1	1	1	1
Ferric Chloride (50% in H2O)	1	1	1	1	1
Ferric Nitrate	1	1	1	1	1
Ferric Sulfate	1	1	1	1	1
Ferrous Chloride	1	1	1	1	1
Ferrous Nitrate	1	1	1	1	1
Ferrous Sulfate	1	1	1	1	1
Fluorine	1	-	-	-	-
Formaldehyde (37% in H2O)	1	1	-	-	-
Formic Acid	1	1	1	1	1
Fuel Oil	1	1	1	1	1
Furane	3	NR	-	-	-
Furfural	2	2	3	NR	-
Gallic Acid	1	2	-	-	-
Gas - Manufactured	1	1	1	1	1
Gas – Natural	1	1	1	1	1
Gasoline – Leaded	1	1	1	1	1
Gasoline – Unleaded	1	1	1	1	1
Gasoline – Sour	1	1	1	1	1
Glass Cleaning (Sodium Dichromate/Sulfuric)	NR	(will etch)	-	-	-
Glucose	1	1	1	1	1
Glycerol	1	1	1	1	1
Glycolic Acid	1	2	3	NR	-
Glycol	1	1	1	1	1
Heptane	1	1	1	1	1
Hexane	1	1	1	1	1
Hexanethylene Diamine	3	3	NR	-	-
Hydriodic Acid (48% x 12% I2)	1	1	1	1	1
Hydrobromic Acid (50%)	1	1	1	1	1
Hydrochloric Acid (10%)	1	1	1	1	1
Hydrochloric Acid (20%)	1	1	1	1	1
Hydrochloric Acid (35%)	1	1	1	1	1
Hydrochloric Acid (Conc.)	1	1	1	1	1
Hydrochloric Acid (Gas)	1	1	1	1	1
Hydrocyanic Acid	1	1	1	1	1
Hydrofluoric Acid (30%)	1	1	1	1	1
Hydrofluoric Acid (35%)	1	1	1	1	2
Hydrofluoric Acid (70%)	1	2	3	NR	NR
Hydrofluoric Acid (100%)	2	3	NR	NR	-
Hydrofluosilicic Acid	1	1	1	1	1
Hydrogen	1	1	1	1	1
Hydrogen Cyanide	1	1	1	1	1

Electro Chemical Manufacturing Duro-Bond PVDF Lining

Hydrogen Peroxide (30%)	1	1	1	1	2
Hydrogen Peroxide (90%)	1	-	-	-	-
Hydrogen Phosphide	1	1	-	-	-
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Hydrogen Sulfide (Dry)	1	1	1	1	1
Hydrogen Sulfide (Wet)	1	1	1	1	1
Hypochlorous Acid	1	1	1	1	1
Iodine (Dry)	1	1	1	-	-
Iodine (Liquid)	1	1	1	2	3
Iodine (Wet)	1	1	1	-	-
Iodoform	1	1	1	1	-
Isopropyl Alcohol	1	1	1	1	-
Isopropyl Myristate (Ester)	1	2	3	NR	-
Jet Fuel - JP4	1	1	1	1	-
Jet Fuel - JP5	1	1	1	1	-
Kerosene	1	1	1	1	1
Ketones	1	2	3	NR	-
Lactic Acid	1	2	3	NR	-
Lard Oil	1	1	1	1	1
Lauric Acid	1	1	1	1	1
Lauryl Chloride	1	1	1	1	1
Lead Acetate	1	1	1	1	1
Lemon Oil	1	1	1	1	1
Linoleic Acid	1	1	1	1	1
Linseed Oil	1	1	1	1	1
Lubricating Oil	1	1	1	1	1
Magnesium Carbonate	1	1	1	1	1
Magnesium Chloride	1	1	1	1	1
Magnesium Hydroxide	1	1	1	1	1
Magnesium Nitrate	1	1	1	1	1
Magnesium Sulfate	1	1	1	1	1
Maleic Acid	1	1	1	1	1
Malic Acid	1	1	1	1	1
Mercuric Chloride	1	1	1	1	1
Mercuric Cyanide	1	1	1	1	1
Mercuric Nitrate	1	1	1	1	1
Mercury	1	1	1	1	1
Mercury Amalgam	NR	-	-	-	-
Methane	1	1	1	1	1
Methane Sulfonic Acid (50%)	1	1	1	1	-
Methyl Acrylic Acid	1	1	2	-	-
Methyl Acrylic Monomer	NR	-	-	-	-
Methanol-Methyl Alcohol	1	1	1	1	1
Methyl Bromide	1	1	1	1	1
Methyl Borate	1	1	-	-	-
Methyl Cellosolve	1	1	1	1	1
Methyl Chloride	1	1	1	1	1
Methyl Chloroform(1-1-1Trichloroethane)1	1	-	-	-	-
Methyl Ethyl Ketone	3	3	3	NR	-
Methyl Sulfuric Acid	1	1	-	-	-
Methylene Chloride	1	2	-	-	-
Methyl Isobutyl Ketone	1	2	3	NR	-
Milk	1	1	1	1	-
Mineral Oil	1	1	1	1	-
Monochloroacetic Acid	2	2	3	NR	-
Monochloroethane	1	1	1	1	1

Electro Chemical Manufacturing Duro-Bond PVDF Lining

Monoethanolamine	3	NR	-	-	-
Monochlorobenzene	1	1	1	2	-
Morpholine	2	3	NR	-	-
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Naphtha	1	1	1	1	1
Naphthalene	1	1	1	1	2
Nickel Chloride	1	1	1	1	1
Nickel Nitrate	1	1	1	1	1
Nickel Sulfate	1	1	1	1	1
Nicotine	1	2	2	-	-
Nicotinic Acid	1	1	1	1	-
Nitric Acid (10%)	1	1	1	2	3
Nitric Acid (50%)	1	1	2	3	NR
Nitric Acid (Conc) (70%)	1	1	2	NR	-
Nitric Acid - Fuming	3	NR	-	-	-
Nitric Acid - Sulfuric Acid 50/50	1	1	2	NR	-
Nitrobenzene	1	2	2	-	-
Nitrogen Dioxide	1	1	1	2	3
Nitromethane	1	1	-	-	-
Nitrosyl Chloride	NR	-	-	-	-
Nitrous Acid	1	1	-	-	-
Nyozide (Herbicide)	NR	-	-	-	-
Octane	1	1	-	-	-
Octene	1	1	-	-	-
Oleic Acid	1	1	-	-	-
Oleum	NR	-	-	-	-
Oxalic Acid	1	1	2	3	-
Oxygen	1	1	1	1	1
Ozone	1	1	1	1	1
Para Chloro Ortho Cresol	1	1	2	3	-
Para Nitro Toluene	1	2	3	NR	-
Palmitic Acid	1	1	1	1	1
Perchloric Acid (72%)	1	1	-	-	-
Perchloric Acid (10%)	1	1	1	1	-
Perchlroethylene	1	1	1	1	1
Phenol (100%)	1	1	2	3	NR
Phenol (10%)	1	1	1	2	3
Phenylethylene (Styrene)	1	1	1	2	-
Phenylhydrazine	1	1	-	-	-
Phosgene	1	2	3	NR	-
Phosphoric Acid (30%)	1	1	1	1	1
Phosphoric Acid (85%)	1	1	1	1	1
Phosphorus Oxychloride (POCl3)	NR	-	-	-	-
Phosphorus Pentoxide (P2O5)	1	1	1	1	-
Phosphorus Trichloride (PCI3)	1	1	1	1	-
Phthalic Acid	1	1	1	1	2
Picric Acid	1	-	-	-	-
Polyvinyl Acetate	1	1	1	1	1
Potassium Bromide	1	1	1	1	1
Potassium Carbonate	1	1	1	1	1
Potassium Chlorate	1	1	1	1	2
Potassium Chloride	1	1	1	1	1
Potassium Cyanide	1	1	1	1	1
Potassium Dichromate	1	1	1	1	1
Potassium Ferrocyanide	1	1	1	1	1
Potassium Hydroxide	1	1	1	1	-

Electro Chemical Manufacturing Duro-Bond PVDF Lining

Potassium Nitrate	1	1	1	1	1
Potassium Permanganate	1	1	1	1	1
Potassium Sulfate	1	1	1	1	1
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Potassium Sulfide	1	1	1	1	1
Propane	1	1	1	1	1
Propyl Amine	3	NR	-	-	-
Propyl Alcohol	1	1	2	3	-
Propylene Dichloride	NR	-	-	-	-
Propylene Oxide	3	-	-	-	-
Pyridine	3	3	NR	-	-
Pyrogallol	1	1	-	-	-
Para Chloro Phenol	1	2	3	NR	-
Refrigerant 11	1	1	1	1	-
Refrigerant 12	1	1	1	1	-
Refrigerant 22	1	1	1	1	-
Refrigerant 113	1	1	1	1	2
Salicylic Acid	1	1	1	1	-
Salicyl-aldehyde	1	1	2	3	-
Sea Water	1	1	1	1	1
Silver Cyanide	1	1	1	1	1
Silver Nitrate	1	1	1	1	1
Sodium Acetate	1	1	1	1	1
Sodium Benzoate	1	1	1	1	1
Sodium Bicarbonate	1	1	1	1	1
Sodium Bisulfate	1	1	1	1	1
Sodium Bisulfite	1	1	1	1	1
Sodium Bromide	1	1	1	1	1
Sodium Carbonate	1	1	1	1	1
Sodium Chlorate	1	1	1	1	1
Sodium Chloride	1	1	1	1	1
Sodium Cyanide	1	1	1	1	1
Sodium Fluoride	1	1	1	1	1
Sodium Hydroxide (50%)**	1	1	2	3	3
Sodium Hydroxide (10%)	1	1	1	2	3
Sodium Hypobromide	1	1	1	1	-
Sodium Hypochlorite	1	1	1	1	1
Sodium Hypochlorite (17%)	1	1	1	1	2
Sodium Nitrate	1	1	1	1	1
Sodium Nitrite	1	1	1	1	1
Sodium Peroxide	1	1	1	1	1
Sodium Phosphate	1	1	1	1	1
Sodium Silicate	1	1	1	1	1
Sodium Sulfate	1	1	1	1	1
Sodium Sulfide	1	1	1	1	1
Sodium Sulfite	1	1	1	1	1
Sodium Thiosulfate	1	1	1	1	1
Sour Crude Oil	1	1	1	1	1
Stannous Chloride	1	1	1	1	1
Stearic Acid	1	1	1	1	1
Stoddard's Solvent	1	1	1	1	1
Styrene	1	1	1	2	2
Sulfur Chloride	1	-	-	-	-
Sulfur Dichloride	1	-	-	-	-
Sulfur Dioxide	1	1	1	2	3
Sulfur Trioxide	3	NR	-	-	-



Electro Chemical Manufacturing Duro-Bond PVDF Lining

Sulfuric Acid - Fuming	3	NR	-	-	-
** Rating does not apply in processes where mercury amalgam is formed.					
<b>Chemical</b>	<b>70°F</b>	<b>120°F</b>	<b>150°F</b>	<b>212°F</b>	<b>225°F</b>
Sulfuric Acid (10%)	1	1	1	1	1
Sulfuric Acid (16%)	1	1	1	1	1
Sulfuric Acid (30%)	1	1	1	1	1
Sulfuric Acid (50%)	1	1	1	1	1
Sulfuric Acid (60%)	1	1	1	1	2
Sulfuric Acid (85%)	1	1	1	2	3
Sulfuric Acid (93%)	1	1	1	2	3
Sulfuric Acid (98%)	1	1	2	3	NR
Succinic	1	1	1	1	1
Sulfophthalic Acid (50% Aqueous - pH)	1	2	-	-	-
Sulfurous Oxochloride	2	3	-	-	-
Sulfurous Acid	1	1	1	1	-
Sulfuryl Chloride	2	3	-	-	-
Tall Oil	1	1	1	1	1
Tannic Acid	1	1	1	1	1
Tartaric Acid	1	1	1	1	-
Tetraethyl Lead	1	1	1	1	-
Tetrahydrofuran	2	3	-	-	-
Tetramethyl AmmoniumHydroxide (50%) <sup>1</sup>	1	1	1	-	-
Thionyl Chloride	2	3	-	-	-
TDI - Toluene Dissocyanate	NR	-	-	-	-
Toluene	1	1	1	2	3
Tributyl Phosphate	1	2	NR	-	-
Trichloroacetic Acid	1	2	3	NR	-
Trichloroethane	1	1	-	-	-
Trichloroethylene	1	1	1	1	1
Triethylamine	1	1	2	3	-
Triethyl Phosphate	3	3	3	3	3
Trisodium Phosphate	1	1	1	1	1
Trimethyl Borate	1	-	-	-	-
Turpentine	1	-	-	-	-
UDMH-Hydrazine (50-50)	1	2	-	-	-
Urea (50% H <sub>2</sub> O)	1	1	1	1	1
Varsol	1	1	1	1	1
Vinyl Acetate	1	1	1	1	1
Vinyl Chloride Monomer	1	2	3	-	-
Water	1	1	1	1	1
White Acid	1	1	1	1	1
Xylol	1	1	1	1	-
Zinc Chloride	1	1	1	1	1
Zinc Nitrate	1	1	1	1	1
Zinc Sulfate	1	1	1	1	1

**Physical Properties**

Chemical characterization	Thermoplastic fluorocarbon polymer
Color	Clear to translucent, depending on thickness
Odor	None
Melting point	178°C
Upper Service Temperature	150°C
Density (23°C)	1.78 g/cm <sup>3</sup>

## Electro Chemical Manufacturing Duro-Bond PVDF Lining

Tensile Strength (N/mm <sup>2</sup> )	40 - 60
Elongation at Break	20 - 80%
Solubility in water	Insoluble
Explosion limits	None
Hardness Durometer	D 78
Water absorption	< 0.03
Oxygen Index (%)	> 44
Flammability	V-0
Thermal Expansion Coefficient 23 -150°C (mm/mm/°C)	12.8 x 10 <sup>-5</sup>

## Application

The method of application is as follows:

1. The surface to be lined is properly cleaned and grit blasted to a white metal finish to provide a suitable surface for bonding. (See [Electro Chemical Manufacturing Technical Bulletin #1](#), "Specification for Welded Steel Tanks, Stacks, Ducts or Other Fabricated Equipment for Protective Linings and/or Coatings".)
2. The **Duro-Bond PVDF** laminate is cut into panels to cover the entire area to be lined with a minimum amount of joints to be welded.
3. The panels are then cemented into position and the seams welded with PVDF rod and PVDF cap strip using a thermoplastic welding gun.

## Method of Testing

All lined surfaces are visually inspected for surface defects. Any special dimensional tolerances required after lining are also checked.

All lined areas are then spark tested for pinhole leaks using a dielectric spark tester adjusted to 10,000 volts. The tester is moved constantly and quickly over the lining surface to prevent a burn through.

## Repair Procedures

**Duro-Bond PVDF** sheet lining can be shop or field repaired. The repairs to defective or damaged areas in the sheet lining are accomplished by cutting out the faulty area, grinding or grit blasting the substrate surface, preparing a piece of sheet of the same dimension, cementing it into position and subsequently welding the joints as described under Application. The repaired area is then inspected and spark tested to insure lining integrity.

## Additional Information

For additional technical or safety information, contact us at 330-313-6372, [knightmaterials.com](http://knightmaterials.com), or [info@knightmaterials.com](mailto:info@knightmaterials.com).

Knight Material Technologies, LLC  
5385 Orchard View Dr. SE  
East Canton, OH 44730

The data provided herein falls within the normal range of product properties, but they should not be used to establish specification limits nor used alone as the basis of design. Electro Chemical Manufacturing assumes no obligation or liability for any advice furnished by it or for results obtained with respect to these products. All such data and advice is provided gratis and Buyer assumes sole responsibility for results obtained in reliance thereon.