ELECTRO CHEMICAL
ENGINEERING & MANUFACTURING CO.

EC Duro-Bond
Neoprene Sheet Lining

Description

Duro-Bond Neoprene is an elastomeric sheet lining having good abrasion and chemical resistance. It is available either as a precured lining or as an uncured lining that must be vulcanized with steam or hot air before it can be used. Sheet thicknesses of 60 mils (1.1 mm), 120 mils (2.3 mm), 150 mils (3.4 mm), and 180 mils (4.6 mm) are available.

Uses

Duro-Bond Neoprene is used as a lining material for resistance to chemical agents and abrasion. It is used for lining equipment such as concrete and steel tanks, agitators, shafts, and troughs.

Advantages

Duro-Bond Neoprene sheet lining may be applied to a variety of surfaces and in various thicknesses. Precured Neoprene lining does not require equipment for vulcanization. It can be used to line tanks and trenches in which steam or hot air curing is impractical.

Uncured Hypalon is applied while in the soft, pre-vulcanized state. It readily conforms to curved surfaces and can be easily applied to complex shaped equipment before it is vulcanized. When properly applied and cured, **Duro-Bond Neoprene sheet lining** exhibits excellent adhesive bond strength. On blasted steel the 90^{o} peel-pull adhesion is in excess of 25 pounds per inch width in accordance with ASTM D903.

Service Temperature

The maximum temperature for which **Duro-Bond Neoprene** is recommended is 220^{o}F (105^{o}C). In elevated temperatures elastomers will harden and age prematurely, resulting in cracks and lining failure. It is sometimes desirable to provide thermal insulation, thereby increasing the service life of the lining. Corrosion resistant red shale or carbon brick are generally used for this purpose. One or more courses of brick bonded with one of **the Electro Chemical** corrosion resistant cements may be required to obtain the desired temperature reduction.

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 Engineering & Manufacturing Co. For resistance of **Duro-Bond Neoprene** to chemicals not listed, contact our Engineering Department at:

inquiry@electrochemical.net or **1-800-235-1885**.

Key to Chemical Resistance Chart:
NR = Not Recommended

Max. Temp (^oF) = Maximum recommended for continuous service

Reagent	Remarks	Max. Temp (^oF)
Acetic Acid		NR
Acetic Anhydride		NR
Acetone		NR
Aluminum Chloride	pH over 6	150
Aluminum Fluoride		200
Aluminum Hydroxide		200
Aluminum Nitrate	pH over 6.5	150
Aluminum Sulfate		200
Ammonia: Aqua 18-25%		NR
Ammonia: Gas (dry)		NR
Ammonia Water		NR
Ammonium Acetate	10% pH over 6	NR
Ammonium Bifluoride		NR
Ammonium Carbonate		150
Ammonium Chloride	pH over 6	180
Ammonium Fluoride		NR
Ammonium Hydroxide		NR
Ammonium Nitrate	pH over 6.5	200
Ammonium Phosphate		150
Ammonium Sulfate		200
Amyl Alcohol		180
Aniline and Aniline Oil		NR
Aniline Hydrochloride		NR
Aromatic Hydrocarbons		NR
Arsenic Acid		125
Barium Carbonate		150
Barium Chloride	pH over 6	175
Barium Hydroxide		200
Barium Sulfate		200
Barium Sulfide		200
Barium Sulfite		NR
Benzene (coal tar)		NR
Benzene (gasoline type)		NR
Benzoic Acid		150
Black Liquor (sulfate)		100
Bleach		NR
Borax		200
Boric Acid		200
Brine Solution		200
Bromine		NR
Butane		NR
Butyl Acetate		NR
Butyl Alcohol (butanol)		NR
Butyric Acid		NR
Cadmium Cyanide		150
Calcium Acetate		NR
Calcium Bisulfate		150
Calcium Bisulfite		NR
Calcium Bleach (Calcium Hypochlorite)		NR
Calcium Carbonate		200
Calcium Chloride	pH over 6	175
Calcium Hydroxide		200
Calcium Hypochlorite		NR

Reagent	Remarks	Max. Temp (^oF)
Calcium Nitrate	pH over 6.5	200
Calcium Oxide, Dry		200
Calcium Sulfate		150
Carbolic Acid (phenol)		NR
Carbon Bisulfide		NR
Carbon Dioxide (wet)		200
Carbon Dioxide (dry)		200
Carbon Tetrachloride		NR
Carbonic Acid		200
Castor Oil		120
Caustic Soda (Sodium Hydroxide)		200
Chloracetic Acid		NR
Chlorinated Hydrocarbons		NR
Chlorine, dry		NR
Chlorine, wet		NR
Chlorine Dioxide		NR
Chromic Acid		NR
Citric Acid		150
Copper Chloride		200
Copper Nitrate	pH over 6.5	150
Copper Sulfate		200
Cresylic Acid		NR
Ethanol (Ethyl Alcohol)		100
Ethers		NR
Ethyl Acetate		NR
Ethyl Alcohol		100
Ethyl Chloride		NR
Ethylene Glycol		100
Fatty Acids		NR
Ferric Chloride	pH over 6	85
Ferric Nitrate	pH over 6.5	200
Ferric Sulfate		200
Ferrous Ammonium Sulfate		200
Ferrous Chloride	pH over 6	80
Ferrous Nitrate		200
Ferrous Sulfate		150
Fluoboric Acid		100
Fluorine Gas (wet)		NR
Fluorine Gas (dry)		NR
Fluosilicic Acid		100
Formaldehyde		NR
Formic Acid		NR
Gasoline		NR
Glycerine		150
Hydrobromic Acid		NR
Hydrochloric Acid		NR
Hydrofluoric Acid		NR
Hydrofluosilicic Acid		100
Hydrogen Peroxide		NR
Hydrogen Sulfide		NR

Hydrogen Sulfite		NR
Hypochlorous Acid		NR
Kerosene		NR
Lead Chloride	pH over 6	200
Reagent	**Remarks**	**Max. Temp (°F)**
Lead Nitrate	pH over 6	120
Lead Sulfate		100
Lime, dry (Calcium Oxide)		200
Lime, flaked (Calcium Hydroxide)		200
Lithium Chloride	pH over 6	200
Magnesium Carbonate	(Basic)	200
Magnesium Chloride	pH over 6	200
Magnesium Hydroxide		200
Magnesium Nitrate	pH over 6.	200
Magnesium Sulfate		200
Maleic Acid		NR
Malic Acid		NR
Manganese Sulfate		200
Mercuric Chloride	pH over 6	NR
Mercuric Cyanide		NR
Mercurous Nitrate		NR
Methyl Alcohol	(Methanol)	100
Methyl Chloride		NR
Mineral Oils		NR
Muriatic Acid (Hydrochloric Acid)		NR
Nickel Chloride	pH over 6	200
Nickel Nitrate	pH over 6.5	100
Nickel Sulfate		200
Niter(Potassium Nitrate)	pH over 6.5	200
Nitric Acid		NR
Nitric Acid, 40%		NR
Nitrous Acid		NR
Oleic Acid		NR
Oleum (Fuming Sulfuric Acid)		NR
Oxalic Acid		150
Palmitric Acid		NR
Perchloric Acid	(Dihydrate)	NR
Petroleum Oils, Crude		NR
Phenol(Carbolic Acid)		NR
Phosphoric Acid, 85%		150
Plating Solution, Cadmium		150
Plating Solution, Chrome		150
Plating Solution, Lead		150
Potassium Acid Sulfate		200
Potassium Bicarbonate		200
Potassium Bichromate	pH over 6	150
Potassium Bisulfate		150
Potassium Bisulfite		NR
Potassium Carbonate		200
Potassium Chloride	pH over 6	150
Potassium Cyanide		150
Potassium Dichromate	pH over 6	NR
Potassium Ferricyanide		NR
Potassium Hydroxide, 25%		220
Potassium Hydroxide, Sat. over 25%		220

Reagent	**Remarks**	**Max. Temp (°F)**
Potassium Nitrate	pH over 6.5	200
Potassium Permanganate	pH over 7.0	NR
Potassium Phosphate	Mono-Di/Tri-Basic	200
Potassium Silicate		200
Potassium Sulfate		200
Potassium Sulfide		200
Potassium Sulfite	pH over 6	150
Potassium Thiosulfate		150
Propane		NR
Propyl Alcohol		120
Sodium Acid Sulfate		200
Sodium Bicarbonate		200
Sodium Bichromate	pH over 6	50
Sodium Bisulfate		170
Sodium Bisulfite		200
Sodium Borate		200
Sodium Carbonate		200
Sodium Chloride	pH over 6	200
Sodium Cyanide		150
Sodium Ferricyanide		NR
Sodium Hydroxide		200
Sodium Hypochlorite	pH over 9	NR
Sodium Nitrate	pH over 6.5	200
Sodium Nitrite	pH over 6.5	150
Sodium Perborate		200
Sodium Phosphate	Mono-Di/Tri-Basic	200
Sodium Silicate		200
Sodium Sulfate		200
Sodium Sulfite	pH over 6	150
Sodium Thiosulfate		150
Stannic Chloride	pH over 6	NR
Stannous Chloride	pH over 6	NR
Stearic Acid		NR
Sulfite Liquors		120
Sulfur Dioxide, wet		NR
Sulfuric Acid, 5%		180
Sulfuric Acid, 25%		170
Sulfuric Acid, 50%		75
Sulfuric Acid, 75%		NR
Sulfurous Acid		NR
Tannic Acid		NR
Tartaric Acid		100
Tin Chloride	pH over 6	NR
Trichloroethylene		NR
Triethanolamine		NR
Trisodium Phosphate	pH under 6	200
Turpentine		NA
Urea		150
Water, Sea or Salt		200
Zinc Acetate		NR
Zinc Chloride	pH over 6	150
Zinc Sulfate		150

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Physical Properties

Specific Gravity	Approx. 1.40 to 1.43 (precured) Approx. 1.49 (uncured)
Tensile	1800psi minimum (precured) 1200psi minimum (uncured)
Elongation	Min. 300%
Hardness Shore "A"	Approx. 60 ± 10
Water Absorption (immersion for 4 days @ 212'F)	15% maximum by volume
Flammability	Burns, however, does not support combustion.
Finish	Buffed
Color	Black
Thickness	1/16", 1/8", 3/16" and 1/4"
Abrasion Resistance	Excellent
Weathering Resistance	Excellent
Ozone Resistance Hours	100 ppm @ 1200 F over 300 hours meets requirements for Class E of ASTM D-2000.

Application

The installation of Precured **Duro-Bond Neoprene** elastomeric sheet lining is carried out as follows:

1. On metal surfaces sand or grit blast the areas to be lined to a gray-white metal. For concrete substrates acid washing is required in lieu of sand or grit blasting.
2. Apply one coat of adhesive primer cement immediately after blasting metal to prevent rusting. On concrete the primer should be applied after the acid washed surfaces are dry. Apply additional coat of primer cement, if necessary.
3. Apply required coats of intermediate or tie cement, allowing sufficient drying time so that the coat being applied does not lift up the preceding coat.
4. Apply the specified thickness of Precured **Duro-Bond Neoprene** using the minimum number of sheets and splices consistent with good lining practice. Edges of sheets overlap approximately 2" unless restricted by dimensional tolerances. Lining sheets are washed with recommended solvent and allowed to dry before application. During application, sheets are rolled and all seams and corners carefully stitched to eliminate all trapped air between lining and cemented surfaces so there is full contact with all cemented areas.
5. Edges of all sheets are skived at a 45^o minimum angle from the top surface to the bottom of the sheet. A closed skive construction commonly known as down skive is used wherever Possible. Open skived splices may be used when specified.

The installation of Uncured **Duro-Bond Neoprene** elastomeric sheet lining is carried out as follows:

1. The metal surfaces are sand or grit blasted to a gray-white metal. Special care is taken to insure that the metal is free of all mill scale, rust formations, oil and grease.
2. One coat of primer is applied immediately after blasting metal to prevent rusting. Additional coats of primer are applied if necessary.
3. The required coats of intermediate or tie cement are applied allowing sufficient drying time so that the coat being applied does not lift the preceding coat.

4. Edges of all sheets are skived at an angle from the top surface to the bottom of the sheet. A closed skive construction commonly known as a down skive is used wherever possible. Open skived splices may be used when specified.
5. The uncured sheet is wiped with the recommended solvent and allowed to dry before application. The sheet is then applied using the minimum number of seams consistent with good lining practice. Edges of sheet should over lap approximately 2" unless restricted by dimensional tolerances. During application, sheets are rolled and all seams and corners carefully stitched to eliminate all trapped air between lining and cemented surfaces.
6. Steam curing is required to vulcanize Uncured **Duro-Bond Neoprene** to produce the required physical and chemical properties and adhesion to the metal substrate.

Method of Testing

All lined surfaces are inspected for blisters, lifted edges at seams and surface defects. Any special dimensional tolerances required, after lining, are also checked. All areas are then spark tested for leaks using a dielectric spark tester adjusted to 5000 volts. The tester is moved constantly and quickly over the lining surface to prevent a burn through.

Repair Procedures

Most defects will be blisters between lining and substrate, blow holes where the lining is actually ruptured, small cracks in the lining or physical damage which may result in a scuffed or broken lining. In general, if such a defect occurs, the defective lining is removed to a point where firm adhesion to the substrate is found, a suitable repair made with the same or equivalent lining material (usually a precured sheet) and subsequently testing the repaired areas as described in "Method of Testing".

Additional Information

For additional technical or safety information, contact us at 1-800-235-1885, www.electrochemical.net, or inquiry@electrochemical.net.

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