ELECTRO CHEMICAL
ENGINEERING & MANUFACTURING CO.

EC Duro-Bond
Hypalon® Sheet Lining

Description

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

Uses

Duro-Bond Hypalon is used as a lining material for resistance to chemical agents, heat, and abrasion. It is used for lining equipment such as concrete and steel tanks, agitators, shafts and troughs. It is used extensively in the handling and storage of waste acids.

Advantages

Duro-Bond Hypalon has good electrical and heat resistance plus superior resistance to ozone and oxidizing chemicals. It is generally capable **of** resisting strong acid concentrations at elevated temperatures.

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

Uncured Hypalon is applied while in the soft, unvulcanized state. It readily conforms to curved surfaces and can be easily applied to a wide variety of complex shaped equipment before it is vulcanized.

Service Temperature

The maximum temperature for which **Duro-Bond Hypalon** is recommended is 200^{o}F (93^{o}C). At 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 Hypalon** 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 (°F) = Maximum at which the lining is recommended for continuous service.

Chemical	Remarks	Max. Temp (°F)
Acetic Acid, Dilute		NR
Acetic Acid, Glacial		NR
Acetone		NR
Alum: Ammonium		175
Aluminum Chloride	pH over 6	175
Aluminum Hydroxide		150
Aluminum Nitrate	pH over 6.5	150
Aluminum Sulfate		175
Ammonia: Gas (dry)		NR
Ammonia (Household)		NR
Ammonium Acetate, 10%	pH over 6	100
Ammonium Chloride	pH over 6	175
Ammonium Hydroxide		NR
Ammonium Nitrate	pH over 6.5	175
Ammonium Sulfate		175
Aniline and Aniline Oil		NR
Aromatic Hydrocarbons		NR
Barium Carbonate		200
Barium Chloride	pH over 6	200
Barium Nitrate	pH over 6.5	200
Barium Sulfate		200
Benzene (coal tar)		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		150
Calcium Bisulfate		150
Calcium Chloride	pH over 6	200
Calcium Nitrate	pH over 6.5	200
Calcium Sulfate		175
Carbolic Acid (phenol)		NR
Carbon Bisulfide		NR
Carbon Dioxide (wet)		200
Carbon Dioxide (dry)		200
Carbon Tetrachloride		NR
Carbonic Acid		200
Chlorine, Dry		NR
Chlorine, Wet		NR
Chlorine Dioxide		NR
Chromic Acid		125
Citric Acid		100
Copper Nitrate	pH over 6.5	150
Copper Sulfate		200
Cottonseed Oil		NR
Cresylic Acid		NR
Ethers		NR
Ethyl Acetate		NR
Ethyl Chloride		NR
Ethylene Glycol		150

Chemical	Remarks	Max. Temp (°F)
Fatty Acids		NR
Ferric Chloride	pH over 6	100
Ferric Nitrate	pH over 6.5	125
Ferric Sulfate		125
Ferrous Ammonium Sulfate		200
Ferrous Chloride	pH over 6	175
Ferrous Sulfate		175
Fluoboric Acid		125
Fluorine Gas (wet)		NR
Fluorine Gas (dry)		NR
Fluosilicic Acid		125
Formaldehyde, 400/o		NR
Formic Acid		NR
Gasoline		NR
Glauber's Salts (Sodium Sulfate)		200
Hydrobromic Acid		NR
Hydrochloric Acid		NR
Hydrofluoric Acid		NR
Hydrofluosilicic Acid		125
Hydrogen Peroxide		NR
Hydrogen Sulfide		NR
Hypochlorous Acid		NR
Kerosene		NR
Lead Chloride	pH over 6	150
Lead Sulfate		175
Magnesium Carbonate	Basic	150
Magnesium Chloride	pH over 6	175
Magnesium Hydroxide		150
Magnesium Nitrate	pH over 6.5	150
Magnesium Sulfate		175
Malic Acid		80
Manganese Sulfate		175
Methyl Alcohol (Methanol)		80
Methyl Chloride		NR
Mineral Oils		NR
Muriatic Acid (Hydrochloric Acid)		NR
Nickel Acetate	pH over 6	125
Nickel Chloride	pH over 6	175
Nickel Nitrate	pH over 6.5	150
Nickel Sulfate		200
Niter(Potassium Nitrate)	pH over 6.5	200
Nitric Acid, 5%		100
Nitric Acid, 10%		NR
Nitric Acid, 25%		NR
Nitric Acid, 40%		NR
Nitrous Acid		NR
Oleum (Fuming Sulfuric Acid)		NR
Oxalic Acid		175
Perchloric Acid (Dihydrate)		NR
Phenol (Carbolic Acid)		NR
Plating Solution, Chrome		NR

Chemical	Remarks	Max. Temp (°F)
Potassium Aluminum Sulfate(Alum)		200
Potassium Auricyanide		175
Potassium Bisulfate		175
Potassium Carbonate		200
Potassium Chlorate		200
Potassium Chloride	pH over 6	200
Potassium Chromate	pH over 6	NR
Potassium Cyanide		150
Potassium Dichromate	pH over 6	175
Potassium Hydroxide, 25%		NR
Potassium Iodide	pH over 6.5	150
Potassium Nitrate	pH over 6.5	200
Potassium Permanganate	pH over 7.0	NR
Potassium Phosphate	Mono-Di/Tri-Basic	200
Potassium Silicate		NR
Potassium Sulfate		200
Propane		NR
Rochelle Salts (Potassium Sodium Tartrate)		200
Sodium Bicarbonate		200
Sodium Carbonate		200
Sodium Chloride	pH over 6	200
Sodium Cyanide		150
Sodium Hydroxide, 25%		NR
Sodium Nitrate	pH over 6.5	200
Sodium Permanganate	pH over 7.0	NR
Sodium Phosphate	Mono-Di/Tri-Basic	200
Sodium Sulfate		200
Sodium Sulfite	pH over 6	150
Stannic Chloride	pH over 6	125
Stannous Chloride	pH over 6	150
Sulfuric Acid, 5%		175
Sulfuric Acid, 25%		175
Sulfuric Acid, 50%		150
Tartaric Acid		125
Trichloroethylene		NR
Water, Fresh		100
Water, Sea or Salt		200
Zinc Chloride	pH over 6	150
Zinc Sulfate		175

Physical Properties

Specific Gravity	Approx. 1.38
Tensile	1,100 psi minimum (precured) 1,000 psi minimum (hot air cured)
Elongation	400% minimum
Hardness Shore "A"	
Precured	Approx. 60 +/- 5
Uncured	Approx. 65 +/- 5 (after cure)
Water Absorption (immersion for 70 hr. @ 212° F)	2% maximum by volume
Flammability	Burns, however, does not support combustion.
Finish	Buffed
Color	Black
Thickness	1/8", 3/16" and 1/4"
Abrasion Resistance	Excellent
Weathering Resistance	Excellent

Application

The installation of Precured **Duro-Bond Hypalon** sheet lining is carried out in the following steps:

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. Edges of all sheets are skived at a 45° minimum angle from the top surface to the bottom of the sheet.

5. Apply the specified thickness of **Duro-Bond Hypalon** 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.

The installation of Uncured **Duro-Bond Hypalon** sheet lining is described in the following steps:

1. The metal surfaces are sand or grit blasted to a gray-white metal.
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 down skive is used.
5. The Uncured **Duro-Bond Hypalon** 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 should overlap 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. Hot air is required to vulcanize Uncured **Duro-Bond Hypalon** 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 5,000 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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