UHMW - Chemical Resistance

Northex™ UHMW - PE, like other grades of high density polyethylene, is highly resistant to a broad spectrum of corrosive chemicals and reagents. Resistance information for Northex™ UHMW - PE in contact with a wide variety of chemical environments is tabulated in the following pages.

These reported values are a combination of laboratory results and actual field installation feedback.

It is difficult to duplicate actual service conditions in the laboratory, and since similar in-use applications may vary significantly from one to another, the chart information should be taken only as an indication of the in-service behavior of Northex™UHMW - PE. Whenever possible, a prototype test should be performed by the customer to confirm the polymer's acceptability for use in a particular chemical medium.

In addition to its excellent chemical resistance, Northex™ UHMW - PE exhibits outstanding resistance to environmental stress-cracking as a result of its high molecular weight. Thus, it will give satisfactory performance under conditions that cause brittle fractures in lower molecular weight polyethylenes.

RATING SYSTEM
This chart rates the chemical resistance of Northex™ UHMW - PE in accordance with the following code:

A=NEGLIGIBLE EFFECT
Northex™ UHMW - PE should be acceptable for all applications where these environmental conditions exist.

O=LIMITED ABSORPTION OR ATTACK
Northex™ UHMW - PE may give satisfactory performance if only intermittent service is involved. The user should make his own tests to determine the suitability of the polymer in each particular application.

U=EXTENSIVE ABSORPTION OR ATTACK
Northex™ UHMW - PE dissolves, disintegrates, or swells extensively. The polymer is unsatisfactory for use in these environments.

UHMW - Chemical Resistance

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#1 = Chemical Environment
#2 = Concentration
#3 = Exposure Temperature 23° C (73° F)
#4 = Exposure Temperature 60° C (140° F)

#1	#2	#3	#4
Acetaldehyde	40%	O	U
Acetaldehyde	100%	O	U
Acetic acid	10%	A	A
Acetic acid	60%	A	A
Acetic acid	80-100%	A	O
Acetic anhydride	--	A	O
Acetophenone	100%	O	O
Acetone	--	A	A
Acrylic emulsions	--	A	A
Adipic acid	--	A	A
Allyl alcohol	--	A	O
Allyl chloride	--	O	O
Aluminum acetate	--	A	A
Aluminum chloride	Dilute	A	A
Aluminum chloride	Conc.	A	A
Aluminum fluoride	Conc.	A	A
Aluminum hydroxide	--	A	A
Aluminum oxalate	--	A	A
Aluminum sulfate	Conc.	A	A
Alums(all types)	Conc.	A	A
Ammonia	100% Dry gas	A	A
Ammonium bicarbonate	--	A	A
Ammonium bromide	--	A	A
Ammonium carbonate	--	A	A
Ammonium chloride	Satd.	A	A
Ammonium fluoride	20%	A	A
Ammonium hydrosulfide	-	A	A
Ammonium hydroxide	Aqueous Soln. (S.G.=0.88)	A	A
Ammonium metaphosphate	Satd.	A	A
Ammonium nitrate	Satd.	A	A
Ammonium oxalate	--	A	A
Ammonium persulfate	Satd.	A	A
Ammonium phosphate	--	A	A
Ammonium sulfate	Satd.	A	A
Ammonium sulfide	Satd.	A	A
Ammonium thiocyanate	Satd. 100%	A O	A U
Amyl acetate			
Amyl alcohol	100%	A	A
Amyl chloride	100%	O	U
Aniline	100%	A	A
Aniline hydrochloride	Satd.	O	O
Aniline sulfate	--	A	O
Anisole	100%	O	O
Antimonypentachloride	--	A	A
Antimony trichloride	--	A	A
Aqua regia	--	O	O
Arsenic acid	100%	A	A
Aspirin	--	A	A

#1	#2	#3	#4
Barium carbonate	Satd.	A	A
Barium chloride	Satd.	A	A
Barium hydroxide	--	A	A
Barium sulfate	Satd.	A	A
Barium sulfide	Satd.	A	A
Beer	--	A	A
Benzaldehyde	--	O	U
Benzene	--	O	U
Benzene-sulfonic acid	--	A	A
Benzoic acid	All conc.	A	A
Benzyl alcohol	--	A	A
Bismuth carbonate	Satd.	A	A
Black liquor	--	A	A
Bleach lye	10%	A	A
Borax	Satd.	A	A
Boric acid	All conc.	A	A
Boron trifluoride	--	A	A
Brine	--	A	A
Bromic acid	10%	A	A
Bromine	Dry gas	U	U
Bromine liquid	100%	O	U
Butadiene	--	O	U
Butane	--	A	A
Butanediol	All conc.	A	A
Butter	--	A	A
Butyl acetate	100%	O	U
Butyl alcohol	--	A	A
Butyraldehyde	--	O	U
Butyric acid	Conc.	O	U
Caffeine citrate	--	A	A
Calcium bromide	--	A	A
Calcium carbonate	--	A	A
Calcium chlorate	--	A	A
Calcium chloride	Satd.	A	A
Calcium hydroxide	--	A	A
Calcium hydroxide	Bleach Soln	A	A
Calcium nitrate	50%	A	A
Calcium phosphate	--	A	A
Calcium sulfate	--	A	A
Calcium sulfite	--	A	A
Camphor oil	--	U	U
Carbon dioxide	Wet or dry	A	A
Carbon bisulfide	--	U	U
Carbon monoxide	--	A	A
Carbon tetrachloride	--	U	U
Carbonic acid	--	A	A
Carnauba wax	--	A	A
Carrot juice	--	A	A

RATING SYSTEM
A=NEGLIGIBLE EFFECT
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UHMW - Chemical Resistance

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#1	#2	#3	#4
Castor oil	Conc.	A	A
Catsup	--	A	A
Cetyl alcohol	100%	A	A
Chloroacetic acid	100%	U	U
Chloral hydrate	--	U	U
Chlorine	Dry gas	O	U
Chlorine	Liquid	O	U
Chlorine	Wet gas	O	U
Chlorine water	2% Aqueous	A	A
Chlorine water	Satd. solin.	A	O
Chlorobenzene	--	O	U
Chloroform	--	U	U
Chlorosulfonic acid	100%	U	U
Chrome alum	Satd.	A	A
Chromic acid	80%	A	A
Cider	--	A	A
Citric acid	Conc.	A	A
Citronella oil	--	O	U
Clove oil	--	A	O
Coconut oil alcohols	--	A	A
Cod liver oil	--	A	A
Coffee	--	A	A
Cola concentrates	--	A	A
Copper chloride	Satd.	A	A
Copper cyanide	Satd.	A	A
Copper fluoride	Satd.	A	A
Copper nitrate	Satd.	A	A
Copper sulfate	Satd.	A	A
Corn oil	--	A	A
Cottonseed oil	--	A	A
Creosote	--	U	U
Cresol	100%	U	U
Cresylic Acid	50%	A	A
Cuprous Chloride	Satd.	A	A
Cuprous oxide	--	A	A
Cyclohexane	--	A	O
Cyclohexanol	--	A	A
Cyclohexanone	--	O	U
Decalin	--	U	U
Detergents, synthetic	--	A	A
Developers,photographic	--	A	A
Dextrin	Satd.	A	A
Dextrose	Satd.	A	A
Diazo salts	--	A	A
Dibutyl phthalate	--	A	O
Dichlorobenzene	--	U	U
Dichloroethylene	100%	O	U
Diethyl ether	--	U	U
Diethylene glycol	--	A	A
Diglyconic acid	--	A	A
Dimethylamine	--	U	U
Dioctyl phthalate	--	A	O
Disodium phosphate	--	A	A

#1	#2	#3	#4
Emulsifiers	All conc.	A	A
Emulsions, photographic	--	A	A
Ethanolamine	--	A	A
Ethyl acetate	--	O	O
Ethyl alcohol	100%	A	A
Ethyl butyrate	--	O	O
Ethyl chloride	--	U	U
Ethyl ether	--	O	U
Ethyl formate	--	O	U
Ethylene dichloride	--	U	U
Ethylene glycol	--	A	A
Ethylene oxide	--	A	O
Fatty acids (c6)	100%	A	A
Ferric chloride	Satd.	A	A
Ferric nitrate	Satd.	A	A
Ferric sulfate	--	A	A
Ferrous ammonium citrate	--	A	A
Ferrous chloride	Satd.	A	A
Ferrous sulfate	--	A	A
Fixing solution, photographic	--	A	A
Fluoboric acid	--	A	A
Fluorine	--	A	U
Fluorosilicic acid	Conc.	A	A
Formaldehyde	40%	A	A
Formic acid	20 - 100%	A	A
Fructose	Satd.	A	A
Fruit juices	--	A	A
Fuel oil	--	A	U
Furfural	100%	O	U
Gallic acid	Satd.	A	A
Gasoline	--	O	U
Gearbox oil	--	A	O
Gelatin	--	A	A
Glucose	--	A	A
Glycerin	--	A	A
Glycine	--	A	A
Glycol	--	A	A
Glycolic acid	30%	A	A
Heptane	--	A	O
Hexachlorobenzene	--	A	A
Hexane	--	O	U
Hexanol, tertiary	--	A	A
Hydrobromic acid	50%	A	A
Hydrocyanic acid	Satd.	A	A
Hydrochloric acid	10% - Conc.	A	A
Hydrofluoric acid	40 - 70%	A	A

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#1	#2	#3	#4
Hydrogen	100%	A	A
Hydrogen bromide	10%	A	A
Hydrogen chloride gas	Dry	A	A
Hydrogen peroxide	30%	A	A
Hydrogen peroxide	90%	A	O
Hydrogen phosphide	100%	A	A
Hydrogen sulfide	--	A	A
Hydroquinone	--	A	A
Hypochlorous acid	Conc.	A	A
Inks	--	A	A
Iodine (in alcohol)	--	O	O
Isobutyl alcohol	100%	A	A
Isopropyl alcohol	100%	A	A
Kerosene	--	O	O
Lactic acid	10 - 90%	A	A
Lanolin	100%	A	A
Lard	--	A	A
Lauryl alcohol	--	A	A
Lead acetate	Satd.	A	A
Lead, tetraethyl	100%	A	A
Linseed oil	100%	A	A
Lubricating oil	100%	A	O
Magnesium carbonate	Satd.	A	A
Magnesium chloride	Satd.	A	A
Magnesium hydroxide	Satd.	A	A
Magnesium nitrate	Satd.	A	A
Magnesium sulfate	Satd.	A	A
Magnesium sulfite	Satd.	A	A
Maleic acid	Satd.	A	A
Margarine	--	A	A
Meat juices	--	A	A
Mercuric chloride	Satd.	A	A
Mercuric cyanide	Satd.	A	A
Mercurous nitrate	Satd.	A	A
Mercury	100%	A	A
Methyl alcohol	100%	A	A
Methyl bromide	100%	O	U
Methyl chloride	100%	O	U
Methyl ethyl ketone	100%	U	U
Methylene chloride	100%	U	U
Methylsulfuric acid	--	S	S
Milk	--	S	S
Mineral oil	--	S	S
Molasses	--	S	S
Motor oil	100%	A	O
Naphtha	100%	A	U
Naphthalene	100%	O	U
Natural gas (wet)	Wet	A	A
Nickel chloride	Satd.	A	A
Nickel nitrate	Conc.	A	A
Nickel sulfate	Satd.	A	A

#1	#2	#3	#4
Nitric acid	0 - 30%	O	A
Nitric acid	30 - 50%	O	O
Nitric acid	70%	U	U
Nitric acid	Fuming	U	U
Nitrobenzene	100%	O	U
Nitroglycerin	--	A	U
Oleic acid	--	U	O
Oleum	Conc.	A	U
Olive oil	--	A	A
Oxalic acid	Satd.	A	A
Oxygen	100%	A	A
Ozone	100%	A	O
Palm oil	--	A	A
Paraffin oil	--	A	O
Peppermint oil	--	O	U
Perchloric acid	10%	A	A
Petroleum ether	--	O	U
Petroleum jelly	--	A	A
Phenol	90%	O	U
Phosphoric acid	All conc.	A	A
Phosphorus (yellow)	100%	A	A
Phosphorus pentoxide	100%	A	A
Phosphorus trichloride	100%	A	A
Photographic solutions	--	A	A
Phthalic anhydride	--	A	A
Pickling baths			
Hydrochloric acid	--	A	A
Sulfuric acid	--	A	A
Sulfuric nitric	--	A	U
Picric acid	1%	A	A
Pine oil	--	O	U
Plating solutions			
Brass	--	A	A
Cadmium	--	A	A
Chromium	--	O	O
Copper	--	A	A
Gold	--	A	A
Indium	--	A	A
Lead	--	A	A
Nickel	--	A	A
Rhodium	--	A	A
Silver	--	A	A
Tin	--	A	A
Zinc	--	A	A

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#1	#2	#3	#4
Potassium bicarbonate	Satd.	A	A
Potassium borate	1%	A	A
Potassium bromate	10%	A	A
Potassium bromide	Satd.	A	A
Potassium carbonate	Satd.	A	A
Potassium chlorate	Satd.	A	A
Potassium chloride	Satd.	A	A
Potassium chromate	40%	A	A
Potassium cyanide	Satd.	A	A
Potassium dichromate	40%	A	A
Potassium Ferri/ferrocyanide	Satd.	A	A
Potassium fluoride	--	A	A
Potassium hydroxide	All conc.	A	A
Potassium nitrate	Satd.	A	A
Potassium perborate	Satd.	A	A
Potassium perchlorate	10%	A	A
Potassium permanganate	20%	A	A
Potassium sulfate	Conc.	A	A
Potassium sulfide	Conc.	A	A
Potassium sulfite	Conc.	A	A
Propane gas	--	A	A
Propargyl alcohol	--	A	A
Propyl alcohol	--	A	A
Propylene dichloride	100%	U	U
Propylene glycol	--	A	A
Resorcinol	--	A	A
Salicylic acid	--	A	A
Seawater	--	A	A
Selenic acid	--	A	A
Shortening	--	A	A
Silicic acid	--	A	A
Silicone oil	100%	A	O
Silver nitrate solution	--	A	A
Soap solution	All conc.	A	A
Sodium acetate	Satd.	A	A
Sodium benzoate	35%	A	A
Sodium bicarbonate	Satd.	A	A
Sodium bisulfate	Satd.	A	A
Sodium bisulfite	Satd.	A	A
Sodium borate	--	A	A
Sodium bromide oil solution	--	A	A
Sodium carbonate	Conc.	A	A
Sodium chlorate	Satd.	A	A
Sodium chloride	Satd.	A	A
Sodium cyanide	--	A	A
Sodium dichromate	Satd.	A	A
Sodium ferri/ferrocyanide	Satd.	A	A
Sodium fluoride	Satd.	A	A
Sodium hydroxide	Conc.	A	A
Sodium hypochlorite	20%	A	A
Sodium nitrate	--	A	A
Sodium nitrite	--	A	A
		A	

#1	#2	#3	#4
Sodium phosphate	--	A	A
Sodium silicate	--	A	A
Sodium sulfate	Satd.	A	A
Sodium sulfide	Satd.	A	A
Sodium sulfite	Satd.	A	A
Soybean oil	--	A	A
Spindle oil jy-1	--	O	U
Stannic chloride	Satd.	A	A
Stannous chloride	Satd.	A	A
Starch solution	--	A	A
Stearic acid	100%	A	A
Sugars and syrups	--	A	A
Sulfamic acid	--	A	A
Sulfur	--	A	A
Sulfur dioxide	Dry - 100%	A	A
Sulfur dioxide	Wet - 100%	A	A
Sulfur trioxide	Dry	A	A
Sulfuric acid	0.50%	A	A
Sulfuric acid	80%	A	U
Sulfuric acid	98% Conc.	O	U
Sulfuric acid	Fuming	U	U
Sulfurous acid	--	A	A
Tallow	--	A	O
Tannic acid	10%	A	A
Tannic extracts	--	A	A
Tartaric acid	10%	A	A
Tea	--	A	A
Tetrahydrofuran	100%	O	O
Tetralin	100%	U	U
Toluene	100%	U	U
Transformer oil	100%	A	O
Trichloroacetic acid	10%	O	O
Trichloroethylene	100%	U	U
Triethanolamine	100%	A	O
Trisodium phosphate	Satd.	A	A
Turpentine	--	O	U
Urea	--	A	A
Urine	--	A	A
Vanilla extract	--	A	A
Vinegar	--	A	A
Wetting agents	--	A	A
Whiskey	--	A	A
Wines	--	A	A
Xylene	--	U	U
Yeast	--	A	A
Zinc chloride	Satd.	A	A
Zinc oxide	--	A	A
Zinc sulfate	Satd.	A	A