

# CDF Technical Memo

Number 1

July 2004

## Polyethylene Chemical Resistance Chart

CDF Corporation uses only the highest quality raw materials available. These raw materials have outstanding resistance to both physical and chemical attack. The following chart should be used as a guide for evaluating the suitability of our products with the chemical agent you plan to use. Special consideration must be given to the expected service temperature, stress involved in the application, as well as the length and type of exposure (i.e. intermittent or continuous).

CODES	REAGENT	CONC.	LDPE		HDPE	
			70°	140°	70°	140°
A	Resistant no indication that serviceability would be impaired.					
B	Variable resistance, depending on conditions of use.					
C	Unresistant, not recommended for service applications under any conditions.					
-	Information not available.					
	<b># Plasticizer.</b>					
	Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.					
	<b>+ Oxidizers.</b>					
	Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.					
	Acetone		B	C	B	C
	Acetaldehyde*	100%	B	C	B	C
	Acetic Acid*	10%	A	A	A	A
	Acetic Acid*	60%	A	B	A	B
	Acetic Anhydride*		C	C	C	C
	Air		A	A	A	A
	Aluminum Chloride	all conc	A	A	A	A
	Aluminum Fluoride	all conc	A	A	A	A
	Aluminum Sulphate	all conc	A	A	A	A
	Alums	all types	A	A	A	A
	Ammonia	100% dry gas	A	A	A	A
	Ammonium Carbonate		A	A	A	A
	Ammonium Chloride	sat'd	A	A	A	A
	Ammonium Fluoride	sat'd	A	A	A	A
	Ammonium Hydroxide	10%	A	A	A	A
	Ammonium Hydroxide	28%	A	A	A	A
	Ammonium Nitrate	sat'd	A	A	A	A
	Ammonium Persulphate	sat'd	A	A	A	A
	Ammonium Sulphate	sat'd	A	A	A	A
	Ammonium Metaphosphate	sat'd	A	A	A	A
	Ammonium Sulfide	sat'd	A	A	A	A
	Amyl Acetate#*	100%	C	C	C	C
	Amyl Alcohol#*	100%	A	A	A	A
	Amyl Chloride#	100%	C	C	C	C
	Aniline#*	100%	A	C	C	B
	Aqua Regia+		C	C	C	C
	Arsenic Acid	all conc	A	A	A	A
	Aromatic Hydrocarbons#*		C	C	C	C
	Ascorbic Acid	10%	A	A	A	A
	Barium Carbonate	sat'd	A	A	A	A
	Barium Chloride	sat'd	A	A	A	A
	Barium Hydroxide		A	A	A	A
	Barium Sulphate	sat'd	A	A	A	A
	Barium Sulphide	sat'd	A	A	A	A
	Beer		A	A	A	A
	Benzene#*		C	C	C	C

**CODES**

- A Resistant no indication that serviceability would be impaired.
- B Variable resistance, depending on conditions of use.
- C Unresistant, not recommended for service applications under any conditions.
- Information not available.

**# Plasticizer.**

Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.

**+ Oxidizers.**

Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.

Benzoic Acid	all conc	A	A	A	A
Bismuth Carbonate	sat'd	A	A	A	A
Bleach Lye	10%	A	A	A	A
Borax	sat'd	A	A	A	A
Boric Acid	all conc	A	A	A	A
Boron Trifluoride		A	A	A	A
Brine		A	A	A	A
Bromine+	liquid	C	C	C	C
Bromine Water#	sat'd	C	C	C	C
Butanediol*	10%	A	A	A	A
Butanediol*	60%	A	A	A	A
Butanediol*	100%	A	A	A	A
Butter*		A	A	A	A
n-Butyl Acetate#*	100%	B	C	A	B
n-Butyl Alcohol*	100%	A	A	A	A
Butyric Acid#	conc	C	C	C	C
Calcium Bisulphide		A	A	A	A
Calcium Carbonate	sat'd	A	A	A	A
Calcium Chlorate	sat'd	A	A	A	A
Calcium Chloride	sat'd	A	A	A	A
Calcium Hydroxide	conc	A	A	A	A
Calcium Hypochloride	bleach sol	A	A	A	A
Calcium Nitrate	50%	A	A	A	A
Calcium Oxide	sat'd	A	A	A	A
Calcium Sulphate		A	A	A	A
Camphor Oil#*		C	C	B	C
Carbon Dioxide	all conc	A	A	A	A
Carbon Disulphide		C	C	C	C
Carbon Monoxide		A	A	A	A
Carbon Tetrachloride#		C	C	B	C
Carbonic Acid		A	A	A	A
Castor Oil*	conc	A	A	A	A
Chlorine+	100% dry gas	B	C	C	C
Chlorine Liquid+		C	C	C	C
Chlorine Water+	2% sat'd sol	A	A	A	A
Chlorobenzene#*		C	C	C	C
Chloroform*#		C	C	B	C
Chlorosulphonic Acid	100%	C	C	C	C
Chrome Alum	sat'd	A	A	A	A
Chromic Acid	80%	-	-	-	-
Chromic Acid	50%	A	B	A	B
Chromic Acid	10%	A	A	A	A
Cider*		A	A	A	A
Citric Acid*	sat'd	A	A	A	A
Coconut Oil Alcohols*		A	A	A	A
Coffee		A	A	A	A
Cola Concentrate*		A	A	A	A
Copper Chloride	sat'd	A	A	A	A
Copper Cyanide	sat'd	A	A	A	A
Copper Fluoride	2%	A	A	A	A
Copper Nitrate	sat'd	A	A	A	A
Copper Sulphate	sat'd	A	A	A	A
Corn Oil*		A	A	A	A
Cottonseed Oil*		A	A	A	A
Cuprous Chloride	sat'd	A	A	A	A
Detergents Synthetic*		A	A	A	A
Developers Photographic		A	A	A	A
Dextrin	sat'd	A	A	A	A
Dextrose	sat'd	A	A	A	A

**CODES**

- A** Resistant no indication that serviceability would be impaired.
- B** Variable resistance, depending on conditions of use.
- C** Unresistant, not recommended for service applications under any conditions.
- Information not available.

**# Plasticizer.**

Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.

**+ Oxidizers.**

Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.

Diazo Salts		A	A	A	A
Dibutylphthalate*		B	B	B	B
Dichlorobenzene#*		C	C	C	C
Diethyl Ketone#*		B	C	B	B
Diethylene Glycol*		A	A	A	A
Diglycolic Acid*		A	A	A	A
Dimethylamine		C	C	C	C
Disodium Phosphate		A	A	B	A
Emulsions, Photographic*		A	A	A	A
Ethyl Acetate#*	100%	B	C	B	C
Ethyl Alcohol*	100%	A	A	A	A
Ethyl Alcohol*	35%	A	A	A	A
Ethyl Benzene#*		C	C	C	C
Ethyl Chloride#		C	C	C	C
Ethyl Ether#		C	C	C	C
Ethylene Chloride#*		C	C	C	C
Ethylene Glycol*		A	A	A	A
Fatty Acids*		A	A	A	A
Ferric Chloride	sat'd	A	A	A	A
Ferric Nitrate	sat'd	A	A	A	A
Ferrous Chloride	sat'd	A	A	A	A
Ferrous Sulphate		A	A	A	A
Fish Solubles*		A	A	A	A
Fluoboric Acid		A	A	A	A
Fluosillic Acid	conc	A	B	A	B
Fluosillic Acid	32%	A	A	A	A
Formic Acid	all conc	A	A	A	A
Fructose	sat'd	A	A	A	A
Fruit Pulp*		A	A	A	A
Furtural#	100%	C	C	B	C
Furturyl Alcohol#*		C	C	B	C
Gallic Acid*	sat'd	A	A	A	A
Gasoline#*		C	C	B	B
Glucose		A	A	A	A
Glycerine*		A	A	A	A
Glycol*		A	A	A	A
Glycolic Acid*	30%	A	A	A	A
Grape Sugar		A	A	A	A
n-Heptane#*		C	C	B	B
Hexachlorobenzene		A	A	A	-
Hexanol Tertiary*		A	A	A	A
Hydrobromic Acid	50%	A	A	A	A
Hydrochloric Acid	all conc	A	A	A	A
Hydrocyanic Acid	sat'd	A	A	A	A
Hydrofluoric Acid*	60%	A	A	A	A
Hydrogen	100%	A	A	A	A
Hydrogen Chloride	dry gas	A	A	A	A
Hydrogen Peroxide	30%	A	A	A	A
Hydrogen Peroxide	10%	A	A	A	A
Hydrogen Sulphide		A	A	A	A
Hydroquinone		A	A	A	A
Hypochlorous Acid	conc.	A	A	A	A
Inks*		A	A	A	A
Iodine+	in KI sol'n	B	C	B	-
Isopropyl Alcohol	100%	-	-	-	-
Lead Acetate	sat'd	A	A	A	A
Lead Nitrate		A	A	A	A
Lactic Acid*	20%	A	A	A	A
Linseed Oil*	100%	B	C	B	C

**CODES**

- A** Resistant no indication that serviceability would be impaired.
- B** Variable resistance, depending on conditions of use.
- C** Unresistant, not recommended for service applications under any conditions.
- Information not available.

**# Plasticizer.**

Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.

**+ Oxidizers.**

Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.

Magnesium Carbonate	sat'd	A	A	A	A
Magnesium Chloride	sat'd	A	A	A	A
Magnesium Hydroxide	sat'd	A	A	A	A
Magnesium Nitrate	sat'd	A	A	A	A
Magnesium Sulphate	sat'd	A	A	A	A
Mercuric Chloride	40%	A	A	A	A
Mercuric Cyanide	sat'd	A	A	A	A
Mercury		A	A	A	A
Methyl Alcohol*	100%	A	A	A	A
Methylethyl Ketone#*	100%	B	C	B	C
Methylene Chloride#*	100%	C	C	B	B
Milk		A	A	A	A
Mineral Oils#		B	C	B	C
Molasses		A	A	A	A
Naphtha#*		B	C	B	C
Naphthalene#*		C	C	B	-
Nickel Chloride	conc	A	A	A	A
Nickel Nitrate	sat'd	A	A	A	A
Nickel Sulphate	conc	A	A	A	A
Nicotine*	dilute	A	A	A	A
Nitric Acid	0-30%	A	A	A	A
Nitric Acid+	30-50%	A	B	A	B
Nitric Acid+	70%	A	B	A	B
Nitric Acid+	95-98%	C	C	C	C
Nitrobenzene#*	100%	C	C	C	C
n-Octane		A	A	A	A
Oleic Acid		B	C	B	C
Oxalic Acid*	sat'd	A	A	A	A
Perchloroethylene#		C	C	C	C
Phosphoric Acid	95%	A	B	A	A
Photographic Solutions		A	A	A	A
Plating Solutions*					
Brass		A	A	A	A
Cadmium		A	A	A	A
Chromium		A	A	A	A
Copper		A	A	A	A
Gold		A	A	A	A
Indium		A	A	A	A
Lead		A	A	A	A
Nickel		A	A	A	A
Rhodium		A	A	A	A
Silver		A	A	A	A
Tin		A	A	A	A
Zinc		A	A	A	A
Potassium Bicarbonate	sat'd	A	A	A	A
Potassium Bromide	sat'd	A	A	A	A
Potassium Bromate	10%	A	A	A	A
Potassium Carbonate		A	A	A	A
Potassium Chlorate	sat'd	A	A	A	A
Potassium Chloride	sat'd	A	A	A	A
Potassium Chromate	40%	A	A	A	A
Potassium Cyanide	sat'd	A	A	A	A
Potassium Dichromate	40%	A	A	A	A
Potassium Ferri/Ferro Cyanide	sat'd	A	A	A	A
Potassium Fluoride		A	A	A	A
Potassium Hydroxide	conc	A	A	A	A
Potassium Nitrate	sat'd	A	A	A	A
Potassium Perborate	sat'd	A	A	A	A

**CODES**

- A** Resistant no indication that serviceability would be impaired.
- B** Variable resistance, depending on conditions of use.
- C** Unresistant, not recommended for service applications under any conditions.
- Information not available.

**# Plasticizer.**

Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.

**+ Oxidizers.**

Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.

Potassium Perchlorate	10%	A	A	A	A
Potassium Permanganate	20%	A	A	A	A
Potassium Persulphate	sat'd	A	A	A	A
Potassium Sulphate	conc	A	A	A	A
Potassium Sulphide	conc	A	A	A	A
Potassium Sulphite	conc	A	A	A	A
Propargyl Alcohol*		A	A	A	A
n-Propyl Alcohol*		A	A	A	A
Propylene Dichloride#*	100%	C	C	C	-
Propylene Glycol*		A	A	A	A
Pyridine*		A	-	A	-
Resorcinol	sat'd	A	A	A	A
Salicylic Acid	sat'd	A	A	A	A
Sea Water		A	A	A	A
Selenic Acid		A	A	A	A
Shortening*		A	A	A	A
Sliver Nitrate Sol'n		A	A	A	A
Soap Solutions*	any conc	A	A	A	A
Sodium Acetate	sat'd	A	A	A	A
Sodium Benzoate	35%	A	A	A	A
Sodium Biscarbonate	sat'd	A	A	A	A
Sodium Bisulphate	sat'd	A	A	A	A
Sodium Bisulphite	sat'd	A	A	A	A
Sodium Borate		A	A	A	A
Sodium Bromide	dilute	A	A	A	A
Sodium Carbonate	conc	A	A	A	A
Sodium Chlorate	sat'd	A	A	A	A
Sodium Chloride	sat'd	A	A	A	A
Sodium Cyanide		A	A	A	A
Sodium Dichromate	sat'd	A	A	A	A
Sodium Ferri/Ferro Cyanide	sat'd	A	A	A	A
Sodium Fluoride	sat'd	A	A	A	A
Sodium Hydroxide	conc	A	A	A	A
Sodium Hypochlorite		A	A	A	A
Sodium Nitrate		A	A	A	A
Sodium Sulphate		A	A	A	A
Sodium Sulphide	sat'd	A	A	A	A
Sodium Sulphite	sat'd	A	A	A	A
Stannic Chloride	sat'd	A	A	A	A
Stannous Chloride	sat'd	A	A	A	A
Starch Solution*	sat'd	A	A	A	A
Stearic Acid*	100%	A	A	A	A
Sulphuric Acid	0-50%	A	A	A	A
Sulphuric Acid+	70%	A	B	A	B
Sulphuric Acid+	80%	A	C	A	C
Sulphuric Acid+	96%	B	C	B	C
Sulphuric Acid+	98-conc	B	C	B	C
Sulphuric Acid+	fuming	C	C	C	C
Sulphurous Acid		A	A	A	A
Tallow#		A	B	A	-
Tannic Acid*	sat'd	A	A	A	A
Tartaric Acid		A	A	A	A
Tetrohydrofuran#*		C	C	B	C
Titanium Tetrochloride	sat'd	C	C	C	-
Toluene#*		C	C	B	B
Trichloroethylene#*		C	C	C	C
Triethylene Glycol*		A	A	A	A
Trisodium Phosphate	sat'd	A	A	A	A

**CODES**

- A** Resistant no indication that serviceability would be impaired.
- B** Variable resistance, depending on conditions of use.
- C** Unresistant, not recommended for service applications under any conditions.
- Information not available.

**# Plasticizer.**

Certain types of chemicals are absorbed to varying degrees by polyethylene causing swelling, weight-gain, softening and some loss of yield strength. These plasticizing materials cause no actual chemical degradation of the resin. Several of these chemicals have a strong plasticizing effect (e.g. aromatic hydrocarbons benzene), whereas others have weaker effects (e.g. gasoline). Certain plasticizers are sufficiently volatile that if they are removed from contact with the polyethylene, the part will "dry" out and return to its original condition with no loss of properties.

**+ Oxidizers.**

Oxidizers are the only group of materials capable of chemically degrading polyethylene. The effects on the polyethylene may be gradual even for strong oxidizers and short-term effects may not be measurable. However, if continuous long-term exposure is intended, the chemical effects should be checked regularly.

Turpentine#		C	C	B	B
Urea	0-30%	A	A	A	A
Urine		A	A	A	A
Vanilla Extract*		A	A	A	A
Vinegar		A	A	A	A
Water		A	A	A	A
Wetting Agents*		A	A	A	A
Whiskey*		A	A	A	A
Wines*		A	A	A	A
Xylene#		C	C	B	B
Yeast		A	A	A	A
Zinc Bromide	sat'd	A	A	A	A
Zinc Carbonate	sat'd	A	A	A	A
Zinc Chloride	sat'd	A	A	A	A
Zinc Oxide	sat'd	A	A	A	A
Zinc Stearate		A	A	A	A
Zinc Sulphate	sat'd	A	A	A	A

"All statements, technical information and recommendations contained herein are based on data CDF believes to be reliable, but the accuracy or completeness thereof is not guaranteed. Neither CDF nor its suppliers shall be liable for any injury, loss, or damage, direct or consequential, arising out of the use of or inability to use the data contained herein. The user assumes all risk and liability whatsoever in connection therewith."