Chemical Resistance Reference Chart

AJ product series: WHYTE, PRYCE

Information provided by: Schoeller Allibert Services B.V.

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This chart provides a guideline for the chemical resistance plastic materials used in SA products.

Because so many factors can affect chemical resistance, test your product under your actual conditions of use. Effects of Chemicals on Plastics. Chemicals can affect the strength, flexibility, surface appearance, colour, dimensions, and weight of a plastic. These changes are caused by: (1) an attack on the polymer chain resulting in oxidation, reaction of functional groups, and depolymerisation; (2) dissolution in a solvent and solvent absorption or permeation that causes softening and swelling; and (3) stress cracking from a "stress-cracking agent."

Environmental stress cracking is the failure of a plastic in the presence of certain types of chemicals, but it is not a result of a chemical attack. Simultaneous presence of three factors causes stress cracking: tensile stress in the plastic, its inherent stress-cracking susceptibility, and a stress-cracking agent. Common stress-cracking agents are detergents, surface active chemicals, lubricants, oils, ultrapure water, and plating additives such as brighteners and wetting agents. Relatively small concentrations of stress-cracking agent may be sufficient to cause cracking.

Mixing and/or diluting certain chemicals in plastic containers can be potentially dangerous. The combining of different chemicals or two or more compounds of classes may produce a synergistic or undesirable chemical effect, resulting in an increased temperature that can affect chemical resistance (as temperature increases, resistance to attack decreases), causing product failure. Other factors that also affect chemical resistance include pressure, internal or external stresses (e.g., centrifugation), length of exposure, and concentration of the chemical. Always pre-test your specific usage and follow correct safety procedures.

Attention: Please be aware that, although several polymers may have excellent resistance to various flammable organic chemicals and solvents, OSHA H CFR 29 1910.106 for flammable and combustible materials or other local regulations may restrict the volume of solvents that may legally be stored in an enclosed area.

Key to Chart on Following Pages

E – No damage after 30 days of constant exposure

G – Little or no damage after 30 days of constant exposure

F – Some effect after seven days of constant exposure

N – Immediate damage may occur. Not recommended for continuous use

S – Surface etching possible

First letter of each pair applies to minimum temperature conditions; the second to maximum temperature

PLASTIC RESIN CODE	DESCRIPTION	APPEAR- ANCE	TEMP MAX °C	TEMP MIN °C	AUTOCLAV- ABLE	DRY- HEAT	GAMMA	MICRO- WAVABLE	ETHYLENE OXIDE
HDPE	High-density poly- ethylene	Opaque	120	-35	No	No	Yes	Yes	Yes
PP	Polypropylene	Translucent	135	-20	Yes	No	Yes	Yes	Yes

Reference taken from: www.nationalscientific.com

CHEMICAL	HDPE	PP
1,4-Dioxane	GG	FN
2,2,4-Trimethylpentane	FN	FN
2-Methoxyethanol	EE	GE
2-Propanol	EE	EE
Acetaldehyde	GF	GN
Acetamide, Sat. Acetic Acid, 5%	EE	EE EE
Acetic Acid, 5% Acetic Acid, 50%	EG	EE
Acetic Acid, Glacial	GG	EG
Acetic Anhydride	FF	GF
Acetone	NN	GN
Acetonitrile	EE	EG
Acetophenone	FF	FN
Acrylonitrile	EE	EG
Adipic Acid Alanine	EE	EE
Allyl Alcohol	EE	EE
Aluminum Chloride	EE	EE
Aluminum Hydroxide	EE	EG
Aluminum Salts	EE	EE
Amino Acids	EE	EE
Ammonia (pure)	EE	EE
Ammonia, 25%	EE	EE
Ammonium Acetate, Sat.	EE	EE
Ammonium Chrolete	EE	EE EG
Ammonium Glycolate	EE	EE
Ammonium Hydroxide, 5% Ammonium Hydroxide, 30%	EE	EG
Ammonium Oxalate	EE	EG
Ammonium Salts	EE	EE
Amyl Alcohol	EE	EF
Amyl Chloride	FN	NN
Aniline	GF	EG
Aqua Regia	NN	NN
Arsenic Acid	EE	EE
Benzaldehyde	GN	EG
Benzenamine Benzene	GF NN	EG NN
Benzoic Acid, Sat.	EE	EG
Benzyl Acetate	EE	EG
Benzyl Alcohol	FN	GG
Boric Acid	EE	EE
Bromine	FN	NN
Bromobenzene	NN	NN
Bromoform	NN	NN
Butadiene	FN	NN
Butyl Acetate	GF	FN
Butyl Chloride Butyric Acid	NN FN	NN NN
Calcium Chloride	EE	EE
Calcium Hydroxide, Conc.	EE	EE
Calcium Hypochlorite, Sat.	EE	EE
Carbazole	EE	EE
Carbon Disulfide	NN	NN
Carbon Tetrachloride	GF	GF
Caustic Potash	EE	EE
Caustic Soda, 1%	FF	EE
Caustic Soda Cedarwood Oil	GF FN	EE NN
Cellosolve Acetate	EE	FN
Chlorine Water	GF	FN
Chlorine, 10% (Moist)	GF	FN
Chlorine, 10% in air	EF	FN
Chlorine, wet gas	GF	FN
Chloroacetic Acid	EE	EG
Chlorobenzene	NN	NN
Chloroform	FN	NN
Chromic Acid, 10%	EE	EE
Chromic Acid, 20%	EE	GG
Chromic Acid, 50% Chromic:Sulfuric	EE NN	GF NN
Ontonilo.ouliuno	ININ	ININ

CHEMICAL	HDPE	PP
Cinnamon Oil	NN	NN
Citric Acid, 10%	EE	EE
Copper Sulfate	EE	EE
Cresol	FN	GF
Cyclohexane	FN	GN
Cyclohexanone	FN FN	FN FN
Cyclopentane Decahydronapthtalene	EG	NN
Decalin	EG	NN
Diacetone	NN	GF
Diacetone Alcohol	EE	GF
Dibutylphthalate	FN	GN
Diethyl Benzene	FN	NN
Diethyl Ether	FN	FN
Diethyl Ketone Diethyl Malonate	NN EE	GG EE
Diethylamine	FN	GN
Diethylene Dioxide	GG	NN
Diethylene Glycol	EE	EE
Diethylene Glycol Ethyl Ether	EE	EE
Dimethyl Acetamide	EE	EE
Dimethyl Formamide	EE	EE
Dimethylsulfoxide	EE	EE
Dioxane Dioxanylona Glycol	GG	NN
Dipropylene Glycol DMSO	EE	EE
Ethanol, 40%	EE	EE
Ether	FN	NN
Ethyl Acetate	EE	GN
Ethyl Alcohol (Absolute)	EE	EE
Ethyl Alcohol, 40%	EE	EE
Ethyl Alcohol, 96%	EG	EE
Ethyl Benzene	FN	NN
Ethyl Benzoate	GG	GF
Ethyl Butyrate Ethyl Chloride	GF NN	GN FN
Ethyl Chloride, Liquid	FF	FN
Ethyl Cyanoacetate	EE	EE
Ethyl Lactate	EE	EE
Ethylene Chloride	NN	NN
Ethylene Glycol	EE	EE
Ethylene Glycol Monomethyl Ether	EE	GF
Ethylene Oxide	GF GG	FN GG
Ethylene Oxide Gas Ethylene Oxide, 100%	GF	FN
EtO Gas	EE	EE
EtO	GF	FN
Fatty Acids	EE	EG
Fluorides	EE	EE
Fluorine	GN	NN
Formaldehyde, 10%	EE	EE
Formaldehyde, 40% Formalin, 10%	EG EE	EE
Formalin, 10% Formalin, 40%	EG	EE
Formic Acid	EE	EG
Formic Acid, 3%	EE	EE
Formic Acid, 100%	EE	EG
Formic Acid, 50%	EE	EG
Formic Acid, 85%	EE	EG
Freon TF	EG	EG
Fuel Oil	GF FN	EF FN
Gasoline Glutaraldehyde	EE	EE
Glutaraldehyde Disinfectant	EE	EE
Glycerine	EE	EE
Glycerol	EE	EE
Hexane	GF	GF
Hydrazine	NN	NN
Hydrobromic Acid, 69%	EG	EG
Hydrochloric Acid, 5%	EE	EE
Hydrochloric Acid, 20%	EE	EE

CHEMICAL	LIDDE	DD.
CHEMICAL	HDPE	PP
Hydrochloric Acid, 35%	EE	EG
Hydrofluoric Acid, 4%	EE	EE
Hydrofluoric Acid, 48%	EE	EG
Hydrogen Peroxide, 3%	EE	EG
Hydrogen Peroxide, 30%	EE	EF
Hydrogen Peroxide, 90%	EE	EF
lodine Crystals	NN	EE
Iso-Propanol, 100%	EE	EE
Isobutyl Alcohol	EE	EE
Isopropanol	EE	EE
Isopropanol, 100%	EE	EE
Isopropyl Acetate	EG	GF
Isopropyl Alcohol	EE	EE
Isopropyl Alcohol, 100%	EE	EE
Isopropyl Benzene	FN	FN
Isopropyl Ether	FN	NN
Jet Fuel	FN	FN
Kerosene	FN	FN
Lacquer Thinner	FN	FN
Lactic Acid, 3%	EE	EE
Lactic Acid, 85%	EE	EG
Lead Acetate	EE	EE
Magnesium Chloride	EE	EE
MEK	NN	EG
Mercuric Chloride	EE	EE
Methanol	EE	EE
Mercury	EE	EE
Methanol, 100%	EE	EE
Methoxyethyl Oleate	EE	EG
Methyl Acetate	FF	GF
Methyl Alcohol	-	EE
Methyl Alcohol, 100%	EE	EE
Methyl Ethyl Ketone	NN	EG
Methyl Isobutyl Ketone	NN	GF
Methyl Propyl Ketone	FN	GF
Methyl-t-Butyl Ether	FN	FN
Methylene Chloride	FN	FN
MIBK	NN	GF
Mineral Oil	EF	EF
Mineral Spirits	FN	FN
n-Amyl Acetate	EG	GF
n-Butanol	EE	EE
n-Butyl Acetate	GF	GF
n-Butyl Alcohol	EE	EE
n-Decane	FN	FN
n-Heptane	FF	FF
n-Octane	EE	EE
Nitric Acid, 10%	EE	EE
Nitric Acid, 20%	GG	FF
Nitric Acid, 50%	FN	FN
Nitric Acid, 70%	FN	NN
Nitrobenzene	NN	NN
Nitromethane	FN	FN
o-Dichlorobenzene	NN	FN
Oil, Cedarwood	FN	NN
Oil, Cinnamon	FN	NN
Oil, Mineral	EE	EE
Oil, Pine	FN	EG
Orange Oil	GF	GF
Oxalic Acid, 10%	EE	EE
Ozone	GN	FN
p-Chloroacetophenone	EE	EE
p-Dichlorobenzene	NN	GF
Perchloric Acid	GN	GN
Perchloric Acid, Concentrated (70%)	GN	GN
Perchloroethylene Petroloum	NN	NN
Petroleum	GN	NN
Phenol, 100%	NN	NN
Phenol, 50% Phenol, Crystals	NN	NN
FUEUUL GIVSIAIS	GF	GN

Phenol, Liquid	CHEMICAL	HDPE	PP
Phosphoric Acid, 85% EE EG Ploric Acid NN NN NN Prine Oil FN EG Potassium Chloride EE EE Potassium Hydroxide, 30% EE EE Potassium Permanganate EE EG Proprionic Acid EF EG Proprionic Acid EF EG Propylene Oxide EE EG Propylene Oxide EE EG Propylene Oxide EE EE Resorcinci, Sulland C			NN
Picric Acid	Phosphoric Acid, 5%	EE	EE
Pine Oil FN EG Potassium Chloride EE EE Potassium Hydroxide, 01% FF EE Potassium Hydroxide, 30% EE EE Potassium Hydroxide, Concentrated EE EG Propal Cass EE NN Propose Gas EE NN Propylene Gay EE EE Propylene Oxide EE EE Pyridine NN EE Resorcinol, Sat EE EE Resorcinol, Sat EE EE Salicyla Cadd, Powder EE EE Salicyla Cadd, Sat EE EE Sali Solutions Metallic EE EE See-Butanol EE EE sec-Butanol EE EE	Phosphoric Acid, 85%	EE	EG
Potassium Hydroxide, 01%	Picric Acid	NN	NN
Potassium Hydroxide, 01% FF	Pine Oil	FN	EG
Potassium Hydroxide, Concentrated	Potassium Chloride	EE	EE
Potassium Hydroxide, Concentrated			
Potassium Permanganate	-		
Proprione Gas			
Proprioric Acid	-		
Propylene Gilycol	-		
Propylene Oxide	·		
Pyridine NN EE EE Resorcinol, 5% EE EE EE Resorcinol, Sat. EE EE EE Salicylic Acid, Powder EE EE EE Salicylic Acid, Powder EE EE EE Salicylic Acid, Sat. EE EE EE Sall Solutions, Metallic EE EE EE sec-Butyl Alcohol EE EE EE Silvor Acetate EE EE EE Silvor Acetate EE EE EE Silvor Alcotate EE EE EE Sodium Alcotate EE EE EE Sodium Carbonate EE EE EE Sodium Dichromate EE EE EE Sodium Hydroxide, Tow FF EE EE <td></td> <td></td> <td></td>			
Resorcinol, Sat.			-
Salicylic Acid, Powder EE EE Salicylic Acid, Powder EE EE Salicylic Acid, Sat. EE EE Salit Solutions, Metallic EE EE sec-Butanol EE EE sec-Butyl Alcohol EE EE Silicone Oil EE EE Silver Acetate EE EE Silver Alcotate EE EE Silver Nitrate EE EE Sodium Carbonate EE EE Sodium Carbonate EE EE Sodium Carbonate EE EE Sodium Hydroxide, 1% FF EE Sodium Hydroxide, 1% EE EE Sodium Hydroxide, 10% EE EE Sodium Hydroxide, Concentrated (50%) EE EE Sodium Hydroxide, Concentrated (50%) EE EE Sodium Hydroxide, Concentrated (50%) EE EE Sulfur Dioxide, Wet or Dry Gas EE EE Stearic Acid GG EE </td <td></td> <td>EE</td> <td>EE</td>		EE	EE
Salicylic Acid, Powder EE EE Salicylic Acid, Sat. EE EE Salt Solutions, Metallic EE EE sec-Butyl Alcohol EE EE Silicone Oil EE EE Silver Acetate EE EE Silver Acetate EE EE Silver Acetate EE EE Skydrol LD4 EG EG Sodium Acetate, Sat. EE EE Sodium Acetate, Sat. EE EE Sodium Dichromate EE EE Sodium Hydroxide, 1% FF EE Sodium Hydroxide, 10% EE EE Sodium Hydroxide, Concentrated (50%) EE EE Stearic Acid GG EE Stearic Acid GG	Resorcinol, Sat.	EE	EE
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Sodium Carbonate			
Sodium Dichromate	-		
Sodium Hydroxide, 1%			
Sodium Hydroxide, 10%			
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Sulfuric Acid, Concentrated (96%) FN FN Tartaric Acid EE EE TCA FN GF tert-Butanol EE EG tert-Butyl Alcohol EE EG Tetrahydrofuran FN GF THF FN GF Thionyl Chloride NN NN Tincture of Iodine GF EE Toluene NN NN Toluene NN NN Tributyl Citrate EG GF Trichloroacetic Acid FN GF Trichloroacetic Acid FN GF Trichloroethane NN NN Trichloroethylene NN NN Trichloroethylene NN NN Trichloroethylene NN NN Trisethylene Glycol EE EE Tris Buffer, Solution EG EG Trisodium Phosphate EE EE Turpentine FN FN	Sulfuric Acid, 60%	EG	GF
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Zinc Stearate EE EE		EE	EE
Zinc Sulfate, 10% EE EE	Zinc Stearate	EE	EE
	Zinc Sulfate, 10%	EE	EE