

Technical guide for use of different plasticware products

Physical properties & chemical resistance of plastics

Polypropylene, PP

- Translucent rigid polymer
- Temperature range -20 to +135°C
- Autoclavable at 121°C
- Good to excellent chemical resistance
- Resistant to fatigue, making it tough
- Typically used for beakers, bottles, cylinders, funnels, jugs, etc.



Polytetrafluoroethylene, PTFE

- Opaque rigid polymer
- Wide temperature range -200 to +260°C
- Autoclavable at 121°C
- Unrivalled resistance to almost all chemicals
- Extremely low friction coefficient
- Typically used for EISCO stopcocks in burettes



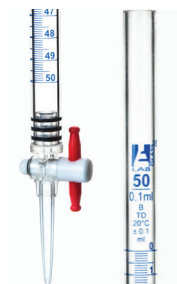
Low Density Polyethylene, LDPE

- Translucent flexible polymer
- Narrow temperature range of -50 to +80°C
- Not autoclavable at 121°C
- Good to excellent chemical resistance
- Robust and virtually unbreakable
- Typically used for wash bottles



Polymethylmethacrylate, Acrylic (PMMA)

- Transparent rigid polymer
- Narrow temperature range -60 to +50°C
- Not autoclavable at 121°C
- Moderate chemical resistance
- Very tough and high clarity
- Typically used for radiation shields



High Density Polyethylene, HDPE

- Translucent rigid polymer
- Broad temperature range of -100 to +120°C
- Not autoclavable at 121°C
- Good to excellent chemical resistance
- High tensile strength making it very tough
- Typically used for bottles



Polystyrene, PS

- Transparent rigid polymer
- Narrow temperature range -40 to +90°C
- Not autoclavable at 121°C
- Moderate chemical resistance
- Brittle yet has excellent clarity
- Typically used for container ware



Polymethylpentene, PMP (TPX)

- Transparent rigid polymer
- Broad temperature range -180 to +145°C
- Autoclavable at 121°C
- Good to excellent chemical resistance
- Has a low density and a high clarity
- Typically used for beakers and cylinders




Polycarbonate, PC


- Transparent rigid polymer
- Broad temperature range -135 to +135°C
- Autoclavable at 121°C
- Moderate chemical resistance
- High impact strength
- Typically used for safety shields





Technical Information - Plasticware

Chemical resistance of plastics

 Good resistance; continuous exposure to the substance causes minor damage within 7 - 30 days

 Poor resistance: not suitable for continuous exposure to the substance. Immediate damage may occur

 No information available


 Excellent resistance: continuous exposure to the substance does not cause damage within 30 days.


	LDPE		HDPE		PP		PMP (TPX)		PVC		PC		PS		SAN		PMMA		PTFE		POM		
	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	
Temperature °C	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	
Acetaldehyde	●	▲	●	■	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●
Acetic Acid (Glacial)	■	▲	●	●	●	■	■	■	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲
Acetic Anhydride	▲	▲	■	■	■	■	●	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲
Acetone	■	▲	▲	▲	■	▲	●	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●
Ammonium Chloride (10%)	●	●	●	●	●	●	●	●	●	■	■	■	●	●	●	●	■	■	●	●	■	■	
Ammonium Hydroxide (30%)	●	●	●	●	●	●	●	●	●	▲	▲	■	■	■	■	■	■	■	●	●	●	●	
Amyl Acetate	■	▲	●	■	■	▲	●	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●	●	●	
Aniline (Phenylamine)	●	■	●	●	●	●	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	■	
Aqua Regia	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	■	▲	▲	▲	▲	●	●	●	
Benzaldehyde	●	■	■	▲	▲	■	●	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Benzene	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Benzoic Acid	●	●	●	●	●	■	●	●	●	■	●	■	■	■	●	●	●	●	●	●	■	■	
Boric Acid (10%)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Butyl Acetate	■	■	■	■	■	■	■	■	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Butyric Acid (Butanoic acid)	▲	▲	■	▲	▲	▲	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Calcium Hydroxide (Saturated)	●	●	●	●	●	●	●	●	●	●	▲	▲	■	■	●	●	■	▲	●	●	●	●	
Carbon Disulphide	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Carbon Tetrachloride	■	▲	■	▲	■	▲	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Chloroform	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	▲	
Citric Acid (1M)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	■	●	■	■	
Cresol	▲	▲	■	▲	■	■	▲	▲	▲	▲	▲	▲	■	▲	▲	▲	▲	▲	▲	▲	●	■	
Cyclohexane	■	▲	■	▲	■	▲	▲	▲	▲	▲	●	■	▲	▲	■	▲	■	■	■	■	●	●	
Dibutyl Phthalate	■	▲	■	▲	■	▲	■	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Dichlorobenzene	■	▲	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	▲	
Diethyl Ether	▲	▲	■	▲	■	▲	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Diethylene Glycol	●	●	●	●	●	●	●	●	■	▲	■	■	●	●	●	●	▲	▲	▲	▲	●	●	
Dimethyl Formamide (DMF)	●	●	●	●	●	●	●	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Dimethyl Sulfoxide (DMSO)	●	●	●	●	●	●	●	●	▲	▲	▲	▲	■	■	▲	▲	▲	▲	▲	▲	■	■	
Dioxane	■	■	■	■	▲	▲	■	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Ethyl Acetate (Ethyl Ester)	●	●	●	●	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Ethyl Alcohol (Absolute Ethanol)	●	■	●	●	●	●	■	●	●	●	■	●	■	▲	▲	▲	▲	▲	▲	▲	●	●	
Ethyl Chloride (Chloroethane)	■	▲	▲	▲	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	■	
Ethylene Chloride	■	▲	▲	▲	■	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	▲	
Ethylene Oxide (Pure)	■	■	■	■	■	■	■	■	▲	▲	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	●	●	
Ethylene Oxide (Gas)	■	■	●	●	●	●	■	■	■	■	●	●	■	■	■	■	■	■	■	■	■	■	
Formaldehyde (Formalin) 40%	●	■	●	■	●	●	●	●	●	●	●	●	■	■	■	▲	●	■	●	●	●	●	
Formic Acid (50%)	■	■	●	●	■	●	●	●	▲	■	■	■	■	■	●	■	■	■	■	■	■	■	
Formic Acid (100%)	■	■	●	●	■	●	●	●	▲	■	▲	■	■	▲	▲	■	■	■	■	■	▲	▲	
Glycerine (Glycerol)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	■	■	


This chart gives general guidelines only on the chemical resistance of plastics. There are many factors that influence chemical resistance, we therefore recommend that you test for your own application before selecting the appropriate product.


Technical Information - Plasticware

Chemical resistance of plastics

 Good resistance; continuous exposure to the substance causes minor damage within 7 - 30 days

 Poor resistance: not suitable for continuous exposure to the substance. Immediate damage may occur

 No information available

 Excellent resistance: continuous exposure to the substance does not cause damage within 30 days.

	LDPE		HDPE		PP		PMP (TPX)		PVC		PC		PS		SAN		PMMA		PTFE		POM		
	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	20	50	
Temperature °C																							
Hexane	▲	▲	■	■	■	■	■	▲	●	▲	■	▲	▲	▲	●	●	●	□	●	●	●	●	
Hydrobromic Acid (69%)	●	●	■	●	■	■	●	●	●	●	■	■	■	■	■	■	▲	▲	●	●	▲	▲	
Hydrochloric Acid (5%)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	■	□	●	●	▲	▲	▲	
Hydrochloric Acid (35%)	●	●	●	●	■	●	■	●	●	■	▲	●	●	●	■	▲	▲	●	●	▲	▲	▲	
Hydrofluoric Acid (48%)	●	●	●	●	■	●	■	■	■	■	▲	▲	▲	●	■	▲	▲	●	●	▲	▲	▲	
Hydrogen Peroxide (30%)	●	●	●	●	■	●	■	●	●	●	●	●	■	●	■	▲	●	●	●	●	▲	▲	
Lactic Acid (85%)	●	●	●	●	■	●	■	●	■	●	■	●	●	●	●	●	●	●	●	●	●	▲	
Methyl Acetate	●	▲	●	●	■	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	□	□	●	●	□	□	
Methyl Alcohol (Methanol)	●	■	●	●	●	●	■	●	●	■	■	■	■	■	▲	▲	▲	▲	●	●	●	●	
Methyl Ethyl Ketone (Butanone)	▲	▲	▲	▲	●	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	□	□	
Methylene Chloride (Dichloro Methane)	▲	▲	●	▲	●	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲	▲	
Mineral Oil	■	●	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Nitric Acid (10%)	●	●	■	■	■	■	■	■	●	●	■	■	●	■	■	■	●	□	●	●	▲	▲	
Nitric Acid (70%)	●	▲	●	▲	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲	▲	
Nitrobenzene	▲	▲	▲	▲	▲	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	■	▲	
Oxalic Acid (10%)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Perchloric Acid (70%)	■	▲	■	▲	■	▲	■	▲	■	▲	▲	▲	▲	▲	■	■	■	■	●	■	▲	▲	
Phenol (100%)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲	▲
Phosphoric Acid (85%)	●	▲	●	●	●	■	●	■	●	■	●	■	●	■	●	●	■	▲	●	●	●	▲	
Picric Acid	▲	▲	▲	▲	▲	▲	●	●	▲	▲	▲	▲	■	■	●	●	□	□	●	●	□	□	
Potassium Hydroxide (30%)	●	●	●	●	●	●	●	●	●	▲	▲	■	■	●	●	●	●	●	●	●	●	●	
Potassium Permanganate	●	●	●	●	■	●	●	●	■	●	●	●	■	■	■	■	▲	●	●	■	■	■	
Propylene Glycol	●	●	●	●	●	●	●	■	■	■	■	●	●	●	●	□	□	●	●	●	●	●	
Pyridine	▲	▲	▲	▲	●	●	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●	■	
Salicylic Acid	●	●	●	●	●	●	●	■	■	●	■	●	■	●	■	□	□	●	●	▲	▲	▲	
Silver Nitrate	●	■	●	●	●	●	●	●	■	●	●	●	●	●	■	□	□	●	●	■	■	■	
Sodium Hydroxide (50%)	■	■	●	●	●	●	●	●	●	▲	▲	●	■	●	■	●	▲	●	●	●	●	●	
Sodium Hypochlorite (15%)	●	■	●	■	■	▲	●	●	●	■	■	●	■	●	●	●	●	●	●	□	□	□	
Sulphuric Acid (20%)	●	●	●	●	●	●	●	●	■	●	■	●	●	●	■	●	●	●	●	□	□	□	
Sulphuric Acid (60%)	●	■	●	■	■	■	●	■	■	■	■	●	■	▲	▲	▲	▲	▲	●	●	▲	▲	
Sulphuric Acid (98%)	■	■	■	■	■	●	■	■	■	▲	▲	▲	■	■	▲	▲	▲	▲	●	●	▲	▲	
Tetrahydrofuran (THF)	■	▲	■	●	■	■	■	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	■	■	
Toluene	■	▲	▲	▲	▲	▲	■	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲	▲	
Trichloroacetic Acid	■	▲	■	▲	■	■	●	●	■	▲	■	▲	■	▲	▲	▲	▲	□	□	●	●	□	□
Trichloroethylene	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	▲	▲	
Turpentine	■	▲	■	▲	■	▲	■	■	■	■	■	■	■	■	■	▲	■	▲	●	●	●	●	
Xylene	▲	▲	■	▲	▲	▲	■	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●	●	
Zinc Chloride (10%)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	■	
Zinc Sulphate (10%)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	■	▲	