

**PHYSICAL PROPERTIES OF PLASTICS**

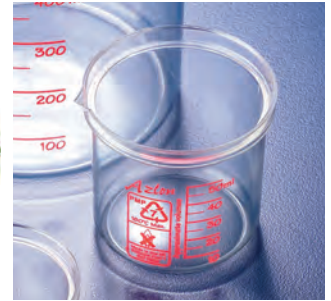
**Polypropylene (PP)**

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



**Polymethylpentene (PMP, TPX)**

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



**Polystyrene (PS)**

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



**Polymethylmethacrylate, Acrylic (PMMA)**

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



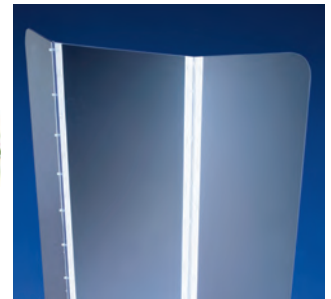
**Low Density Polyethylene (LDPE)**

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



**Polycarbonate (PC)**

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



**High Density Polyethylene (HDPE)**

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



**Polytetrafluoroethylene (PTFE)**

- Opaque rigid polymer
- Wide temperature range -200 to +260°C
- Autoclavable
- Unrivalled resistance to almost all chemicals
- Extremely low friction coefficient
- Typically used for bottles, beakers and stirrers



**Polyvinylchloride (PVC)**

- Rigid polymer
- Narrow temperature range -25 to +70°C
- Not autoclavable
- Moderate chemical resistance
- Rigid or flexible, colored or clear
- Typically used for trays and troughs



## RESIN CHARACTERISTICS

Material		Brittleness Temp.	Max. Use Temp.	Melting Point Range	Transparency	Specific Gravity	Flexibility	Microwaveable
HDPE	High Density Polyethylene	-100°C	120°C	125 to 138°C	Translucent	0.95	Rigid	No
LDPE	Low Density Polyethylene	-100°C	80°C	85 to 125°C	Translucent	0.92	Excellent	Yes
PC	Polycarbonate	-100°C	135°C		Transparent	1.20	Rigid	Marginal
PMMA	Polymethylmethacrylate	-20°C	85°C	85 to 105°C	Transparent	1.19	Rigid	No
PMP	Polymethylpentene	0°C	120°C	235°C	Transparent	0.835	Rigid	Yes
PP	Polypropylene	0°C	135°C	160 to 176°C	Translucent	0.9	Rigid	Yes
PS	Polystyrene	+20°C	90°C		Transparent	1.05	Rigid	No

## STERILIZATION CHART

Material		Withstands Autoclaving	Sterilization Method			
			EtO Gas	Dry Heat	Radiation	Disinfectants
HDPE	High Density Polyethylene	No	Yes	No	Yes	Yes
LDPE	Low Density Polyethylene	No	Yes	No	Yes	Yes
PC	Polycarbonate	Yes	Yes	No	Yes	Some
PMMA	Polymethylmethacrylate	No	No	No	Yes	Some
PMP	Polymethylpentene	Yes	Yes	Yes	No	Yes
PP	Polypropylene	Yes	Yes	No	No	Yes
PS	Polystyrene	No	Yes	No	Yes	Some

Note: Observe the tolerated temperature ranges of plastic when autoclaving laboratory plasticware. Remove any stoppers, fittings or caps from the plasticware prior to autoclaving. Plastic vessels should be autoclaved separately from their closures and other fittings. Autoclaving vessels with their closures in place can lead to deformation and destruction of the vessels. All statements are advisory only and imply no liability on the part of Globe Scientific. All statements relating to the resistances of laboratory plasticware to high temperatures, chemicals and sterilization are based on statements from raw material manufacturers.

## TEMPERATURE RESISTANCE CHART

Material		Temperature Resistance	
		Low	High
HDPE	High Density Polyethylene	-40°C	+120°C
LDPE	Low Density Polyethylene	-50°C	+90°C
PE	Polyethylene	-40°C	+90°C
PMMA	Polymethylmethacrylate	-40°C	+90°C
POM	Polyoxymethylene	-40°C	+110°C
PP	Polypropylene	-0°C*	+130°C
PS	Polystyrene	-10°C	+70°C
PVC	Polyvinylchloride	-20°C	+80°C

\*Note: There are special blends of PP that are used in products like our CryoClear™ cryogenic vials that are able to withstand temperatures down to -196°C.

## CLEANING LABORATORY PLASTICWARE

Most laboratory plasticware is easily cleaned in warm water with a mild detergent and soft cloth or sponge. Avoid using abrasive cleaners or scouring pads which can result in surfaces becoming scratched. Slight contamination can be removed using a chemically neutral (pH7) cleaning agent. Heavy contamination can be removed using an alkaline (pH up to 12) cleaning agent.

If using an automatic laboratory dishwasher to wash plastic volumetric ware, such as measuring cylinders, employ a wash temperature below 60°C. High temperatures can affect volumetric accuracy.

Ultrasonic baths may be used for cleaning plasticware. However do take care that the products do not directly touch the transducer membrane.