

Plastic Properties

Plastic Acroynms

ABS	Acrylonitrile Butadiene Styrene	PA	Polyamide	PSU	Polysulfone
E-CTFE	Ethylene chlorotrifluoroethylene (Halar®)	PC	Polycarbonate	PTFE	Polytetrafluoroethylene (Teflon®)
FEP	Fluorinated ethylenepropylene (Teflon® FEP)	PFA	Perfluoroalkoxy (Teflon® PFA)	PVC	Polyvinyl chloride
FKM	Fluoroelastomer (Viton®)	PMP	Polymethylpentene (TPX®)	PVDF	Polyvinylidene fluoride (Kynar®)
HDPE	Polyethylene (high density)	PP	Polypropylene	SAN	Styrene-acrylnitrile
LDPE	Polyethylene (low density)	PS	Polystyrene	SIR	Silicone rubber

Chemical Resistances

Substance class at 20° C	PS	PC	PA	SAN	ABS	PVC	LDPE	HDPE	PP	PMP	ECTFE	PTFE/ FEP/ PFA	SIR
Aldehydes	-	0	0	-	-	-	+	+	+	0	+	+	0
Alcohols, aliphatic	+	+	0	+	+	+	+	+	+	+	+	+	+
Esters	-	-	+	-	-	-	0	0	0	0	+	+	0
Ethers	-	-	+	-	-	-	-	0	-	-	+	+	-
Ketones	-	-	+	-	-	-	0	0	0	0	0	+	-
Hydrocarbons													
aliphatic	-	0	+	-	-	+	0	+	+	0	+	+	-
aromatic	-	-	+	-	-	-	0	+	0	-	+	+	-
halogenated	-	-	0	-	-	-	-	0	0	-	+	+	-
Acids, weak/diluted	0	0	0	0	0	+	+	+	+	+	+	+	0
Acids, strong/concentrated	0	-	-	-	-	+	+	+	+	+	+	+	-
Acids, oxidizing	-	-	-	-	-	-	0	0	0	0	0	+	-
Bases	-	-	0	+	0	+	+	+	+	+	+	+	+

+ = excellent chemical resistance

0 = good/limited chemical resistance

- = low chemical resistance

Plastic not damaged after 30 days continuous contact with the substance. The plastic may remain resistant for years. Continuous contact for approx. 7 to 30 days causes slight damage which may be partially reversible (softening, swelling, reduction of mechanical strength, discoloration).

Continuous contact causes immediate damage to the plastic (reduction of mechanical strength, deformation, discoloration, cracks, dissolution, risk of breakage).

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Material Characteristics

Plastic	Temperature		Sterilization ⁵							
	max. ¹ °C	min ² °C	steam ⁴ 121 °C	Gas, ethylene oxide	Irradiation, 2.5 kGy	Ethanol	Transparency	Flexibility	Specific Weight, g/cm ³	Water absorption%
ABS	90	-40	no	no	no	no	opaque	good	1.05	0.27
E-CTFE	150°	-100°	yes	yes	no	yes	transparent	moderate	1.7	< 0.10
FEP	205°	-255°	yes	yes	no	yes	transparent	excellent	2.15	< 0.01
FKM	200°	-20°					black	good	1.9	
HDPE	110°	-50°	no	yes	yes	yes	transparent	rigid	0.95	0.01
LDPE	95°	-50°	no	yes	yes	yes	transparent	excellent	0.92	0.01
PA	90°	-0°	no	yes	yes	yes	transparent	rigid	1.13	1.3
PC	135°	-135°	yes	yes	yes	yes	clear	stiff	1.2	0.35
PFA	250°	-270°	yes	yes	no	yes	transparent	excellent	2.15	0.03
PMP	175°	-150°	yes	yes	yes	yes	glass-clear	stiff	0.83	0.01
PP	135°	0°	yes	yes	no	yes	transparent	stiff	0.9	0.02
PS	70°	-20°	no	yes	yes	yes	glass-clear	stiff	1.05	0.05
PSU	165°	-100°	yes	yes		yes	clear	stiff	1.24	0.3
PTFE	270°	-270°	yes	yes	no	yes	opaque	excellent	2.25	<0.01
PVC	70°	-30°	no ³	yes	no	yes	clear	stiff	1.35	0.06
PVDF	160°	-4°	yes	yes	yes	yes	transparent	stiff	1.78	0.04
SAN	95°	-40°	no	yes	no	yes	glass-clear	stiff	1.03	0.05
SIR	180°	-60°	yes	yes	no	yes	transparent	excellent	1.1	

¹ even higher for short periods

² embrittlement temperature

³ except for PVC tubing which can be sterilized with steam up to 121°.

⁴ Frequent steam sterilization reduces mechanical stability!

⁵ First rinse apparatus with distilled water (prevents stress cracks). Remove or slightly unscrew the caps of sealed vessels, retighten when cooled down.