

Gamma Radiation Stability of Selected Polymers

Material	Tolerance Level (KGY)	Comments
ABS	1,000	Protected by Benzene ring structure. Avoid high dose on high impact grades.
PET, PETG	1,000	Very stable, retains excellent clarity. Drying is essential.
Teflon® PTFE	5	Liberates fluorine gas, disintegrates to powder. Avoid use.
Halar® ECTFE	200	
Kynar® PVDF	1000	
Tefzel® ETFE	1000	
FEP	50	Avoid Use
Acetal POM	5	Avoid use due to embrittlement.
Acrylic PMMA	100	Yellows at 20-40 kGy; clarity recovers partially on aging.
Nylon® PA	50	Discolors. Avoid thin films and fibers. Dry before molding.
Torlon® PAI	10,000	
Polyimide (VespeI®, Meldin®)	10,000	Varies based on multiple formulations
Polycarbonate	1,000	Discolors, clarity recovers after aging. Dry before molding.
Polyethylene (HDPE, LDPE, LLDPE, UHMW)	1,000	Crosslinks to gain strength, loses some elongation. All polyethylene radiation stable, low density most resistant.
PPS (Polyphenylene Sulfide)	1,000	
Polypropylene, Radiation Stabilized		
Homopolymer	20-50	Subject to orientation embrittlement. Validate with real time aging.
Copolymers of Propylene-Ethylene	25-60	More stable than Homopolymer.
Polypropylene, natural	20	Avoid use of unstabilized polypropylene.
Polystyrene	10,000	All styrenes are stabilized by Benzene ring structure.
Polysulfone	10,000	Amber color before irradiation.
Polyurethane	10,000	Excellent clarity and chemical resistance to stress-cracking. Drying is essential.
PVC (Polyvinylchloride)	100	Yellows, can be tinted for colour correction.
Phenolics	50,000*	*Verification needed due to multiple formulations
Polyurethane	100-200	Wide variations in urethane chemistry applied to medical devices.
PEEK (polyetheretherketone)		Contact us for details
Ultem® PEI		Contact us for details

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