PROFESSIONAL PLASTICS

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 (Vespel®, 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 Copolymers of Propylene-Ethylene Polypropylene, natural	 **20-50** **25-60** **20**	 Subject to orientation embrittlement. Validate with real time aging. More stable than Homopolymer. 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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