Relative Radiation Stability of Medical Polymers

Dose (kiloGray) at which elongation changes by 25% in ambient air

Thermosets
Polystyrenes
Polyethylenes
Polyesters
High-performance Engineering Resins
Polycarbonate
Polyurethanes
PVC
High-performance fluoropolymers
ABS
Elastomers
Acrylic (PMMA)
Nylon (Polyamides)
Cellulosics
Polypropylene (radiation grades)
Polymethylpentene
FEP
Natural polypropylene
Acetals
PTFE

Within each family is a range of radiation stabilities, the “steps” are intended to show

Physical properties of irradiated polymers are subject to variations due to: 1) Stress (residual and functional), 2) Section thickness, 3) Molecular weight distribution, 4) Morphology, 5) Moisture, 6) Environmental (oxygen temperature) and must be tested in the specific application under consideration.

Relative radiation, stability of medical polymers, courtesy of Ageless Processing Technology (APT), Del Mar, California, USA

References:
- Skel and Williams, “Irradiation Effect on Selected Biomedical Polymers”

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