



TRILLIANT™ XR Thermoplastics for Radiation Shielding

Trilliant™ XR thermoplastic solutions provide a radiation-shielding alternative to the use of lead in healthcare imaging equipment. This pure metal replacement solution can be customized to meet specific density requirements, formulated to meet a broad modulus range, and engineered to meet complex design specifications.

X-ray and CT scanner manufacturers must design machines capable of protecting patients from harmful X-ray exposure. These machines have traditionally been manufactured using lead to provide such protection. However, regulators are pushing for bans on the use of this material, especially in Europe. Trilliant XR radiation shielding thermoplastics are excellent alternatives to lead. Inherently, thermoplastics offer exceptional design freedom for complex parts. This versatile material can also be customized to meet specific gravity requirements, or to match the density of lead (11gm/cm³). By incorporating this more sustainable alternative, organizations can reduce or minimize the costly record management and reporting requirements for working with lead. Device manufacturers will also experience a reduction in overall exposure to this material.

KEY CHARACTERISTICS

- Radiation shielding performance
- Reduced health and environmental impact
- Part consolidation
- Design freedom
- System cost reduction

TARGET MARKET AND APPLICATIONS

Trilliant XR thermoplastics are ideal for use in healthcare applications where lead is commonly used to shield X-ray energy. Because these solutions are able to be processed using various methods, manufacturers of complex components could benefit from increased design flexibility, leading to an overall improvement in total system cost. Ideal applications include collimator components, lining for walls or cabinetry in X-ray suites, and enclosures to protect sensitive electrical and electronic components regularly exposed to X-rays.



TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	TYPICAL VALUE (ENGLISH)	TYPICAL VALUE (SI)
Specific Gravity	ASTM D-792	11.0	11.0
Tensile Modulus ¹	ASTM D-638	1.20E+6 psi	8270 MPa
Tensile Strength ¹ (Yield)	ASTM D-638	3,950 psi	27.2 MPa
Flexural Modulus	ASTM D-790	800,000 psi	5520 MPa
Flexural Strength	ASTM D-790	7,000 psi	48.3 MPa
Notched Izod Impact ²	ASTM D-256A	2.1 ft•lb/in	110 J/m
Deflection Temperature Under Load 66 psi (0.45 MPa), Unannealed, 0.250 in (6.35mm)	ASTM D-648	280°F	138°C
Deflection Temperature Under Load 264 psi (1.8 MPa), Unannealed, 0.250 in (6.35mm)	ASTM D-648	190°F	87.8°C

¹ Type I, 0.20 in/min (5.1 mm/min)

² 73°F (23°C), 0.125 in (3.18 mm), Injection molded