CYCLIC OLEFIN THERMOSET

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Cyclic Olefin Thermoset

Cyclic Olefin Thermoset (COT) is formulated for RF and microwave applications requiring low dielectric loss and stable signal transmission. With a dielectric constant of 2.4 and a loss tangent of 0.0018 measured at 100 GHz , COT maintains reliable performance across mmWave frequencies where typical photopolymers demonstrate high attenuation and variability. Suitable use cases include beamformers, phased array housings, antenna structures, waveguides, metasurfaces, radomes, GRIN lenses, and RF test fixtures that benefit from dimensional stability and thermal reliability.

Unlike cast PTFE or machined PEI/nylon, COT supports rapid iteration of complex internal geometries and enables multi-material part integration in a single build. This reduces development time for radar, satellite communications, and high-frequency electronic systems.

Technical Datasheet

Cyclic Olefin Thermoset

MECHANICAL PROPERTIES	STANDARD TYPE IV 5 MM/MIN	VALUE XY ORIENTATION	VALUE Z ORIENTATION	UNIT
Tensile Yield Strength	ASTM D638	43.3 ± 1.0	32.9 ± 1.7	MPa
Strain at Yield	ASTM D638	5.8 ± 0.7	-	%
Ultimate Tensile Strength	ASTM D638	43.3 ± 1.0	32.9 ± 1.7	MPa
Elongation at Break	ASTM D638	20.1 ± 8	2.7 ± 0.2	%
Tensile Modulus	ASTM D638	1690 ± 190	1530 ± 50	MPa
Impact Strength, Notched Izod (23 °C)	ASTM D256	33 ± 3	-	J/m

THERMAL PROPERTIES	STANDARD	VALUE	UNIT
HDT, 0.455 MPa	ASTM D648	117 ± 3	°C
Coefficient of Thermal Expansion (25 °C)	ASTM D648	90.64	PPM/°C

DIELECTRIC PROPERTIES	STANDARD	VALUE	UNIT
Dielectric Constant (100 GHz)	-	2.4	-
Loss Tangent (100 GHz)	-	0.0018	-

DIELECTRIC CONSTANT AND LOSS TANGENT

Cyclic Olefin Thermoset is an intrinsically low loss tangent and dielectric constant material across a wide range of microwave and mmWave frequencies. The dielectric constant and loss tangent from 10-130 GHz was measured in two orthogonal in-plane directions. Measurements were performed with a double-concave (DC) Fabry-Perot open resonator (FPOR).