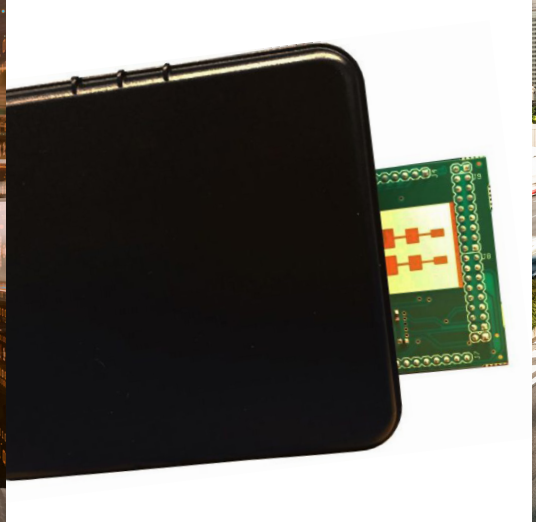


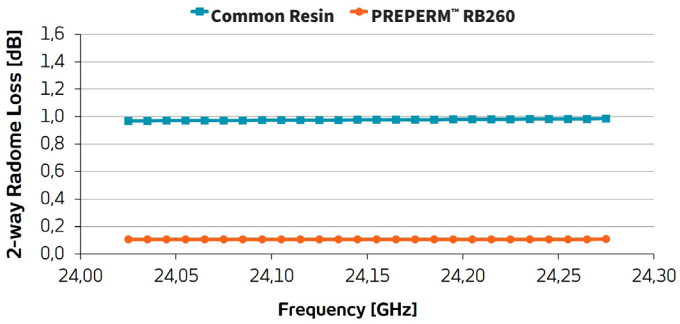
APPLICATION BULLETIN

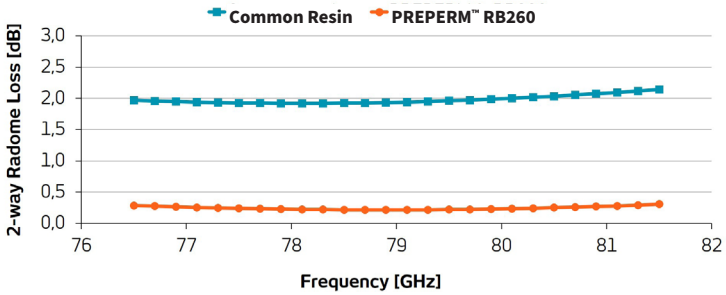
PREPERM™ Solutions for Automotive Radars

Millimeter frequencies put the performance of RF materials into a real test. PREPERM™ thermoplastics are an excellent choice for mmWave radomes due to the low dielectric constant and ultra-low losses. Other benefits include high levels of isotropy, low water absorption, and excellent mechanical properties, even in arctic conditions.

- Low and stable ε_r
- Ultra-low loss
- Low water absorption
- Hydrolysis resistant
- Excellent impact strength
- Mass production friendly

Comparison of PREPERM radome grade and common resin at 24 GHz and 79 GHz bands





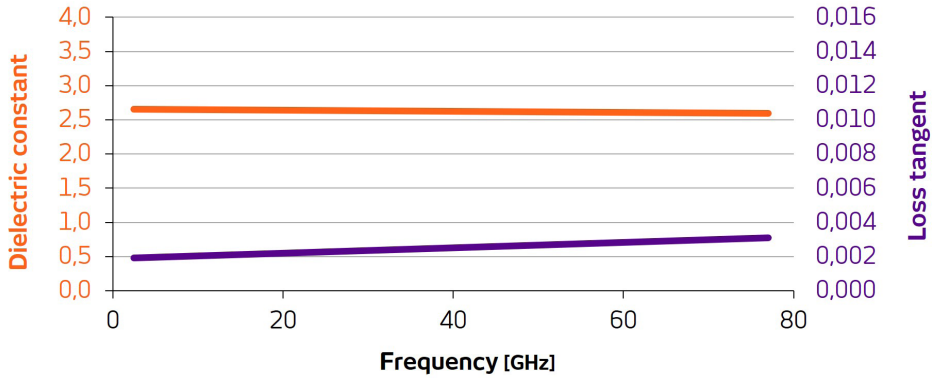
A PREPERM radome grade gives you a longer and wider scanning range compared to common resins.

AVIENT™

	PARAMETER	PBT+GF	PEI	PREPERM RADOME GRADE
ELECTRICAL	ε_r @ 77 GHz	3.5–4.2	3.1	2.6
	Tan @ 77 GHz	0.03	0.003	0.003
	Isotropic @ 77 GHz	No	Yes	Yes
MECHANICAL	Impact strength -20°C/+23°C notched izod	6kJ/m2/6kJ/m2	6kJ/m2/6kJ/m2	25kJ/m2/35kJ/m2
	Elongation @ break	3%	40%	22%
	Brittleness	Yes	Yes	No
THERMAL	Max use temp (HDT)	200–220°C	190–200°C	150–180°C
	Inherent flammability	HB	V0	V1 to V0
ENVIRONMENTAL	Water absorption	0.4%	1.25%	0.2%
	Chemical resistance	Good	Excellent	Good
	Hydrolysis resistant	Specific Grade	Yes	Yes
MANUFACTURING	Batch-to-batch consistency	Limited	Excellent	Excellent
	Moldability	Excellent	Good	Good
	Abrasive	Yes	No	No
	Mold shrinkage	Inconsistent, warpage issue	Homogenous	Homogenous
	Raw material price	Low	High	Moderate

Technical measurement data value depends on a final application and conditions of use for our products.

Typical dielectric properties of PREPERM radome grades as a function of frequency



PREPERM materials are also used in these applications:

- GNSS antennas
- High dielectric constant lenses
- V2X communication

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