



## » TECHNICAL BULLETIN

# PREPERM™ and Edgetek™ Low-Loss Dielectric Thermoplastics

The PREPERM™ and Edgetek™ dielectric portfolios have been specially formulated to meet application demands for materials that enable faster and more reliable connections at high-band 5G frequencies (mmWave).

These customizable thermoplastics provide stable and controlled dielectric performance, plus ultra-low transmission loss at mmWave frequencies up to 220 GHz. With a dielectric constant (Dk) range spanning 2.55 to 23, these materials are optimized to boost antenna efficiency and deliver lightweight solutions for 5G infrastructure and devices.

Injection moldable and colorable, they offer design flexibility and easy processing for faster prototyping and shorter lead times, helping you get to market faster.

### KEY CHARACTERISTICS

- Stable and controlled dielectric performance up to a frequency range of 220 GHz
- Dk range spanning 2.55 to 23
- Ultra-low transmission loss at mmWave
- Allow high design flexibility, part miniaturization and weight reduction
- Easy processability

### MARKETS & APPLICATIONS

These high frequency, conductive materials support the rapid deployment of 5G in industries ranging from telecommunications and consumer electronics to automotive and healthcare.

Ideal applications include antennas, base stations, resonators, lenses, automotive radar, IoT (Internet of Things) devices, and service providers' equipment that directly serves end-users, such as routers and modems.



# KEY PROPERTIES AND PERFORMANCE

## PREPERM™ SERIES

PROPERTIES	CONDITION	ISO	UNIT	STANDARD GRADES											RADOME GRADES		
				PPE260	PPE300	PPE320	PPE350	PPE400	PPE440	PPE500	PPE650	PPE800	PPE950	PPE1200	RS260	RB260	RS265FR
Dielectric Constant (Dk)	2.4 GHz			2.6	3.0	3.2	3.5	4.0	4.4	5.0	6.5	8.0	9.5	12.0	2.6	2.6	2.7
Loss Tangent (Df)	2.4 GHz			0.0009	0.0009	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	0.0009	0.0012	0.0032
Density		1183	g/cm3	1.07	1.18	1.21	1.27	1.43	1.50	1.62	1.86	2.10	2.20	2.40	1.06	1.08	1.09
Melt Flow Index (MFI)	5 kg, 300 °C	1113	g/10 min	15	15	16	14	14	14	15	11	10	4	2	21	16	25
Tensile Strength at Break	23 °C/73 °F	527	MPa	40	45	47	50	50	48	45	43	37	37	36	50	42	52
Flexural Modulus	23 °C/73 °F	178	MPa	2700	2400	2000	2600	2800	2700	2600	2600	2300	2600	2600	2200	2200	2600
Unnotched Izod	23 °C/73 °F	180	kJ/m2	NB	NB	NB	NB	NB	NB	NB	NB	50	28	24	NB	NB	NB
	-20 °C/-4 °F	180	kJ/m2	NB	NB	NB	NB	NB	NB	NB	50	47	27	25	NB	NB	NB
Notched Izod	23 °C/73 °F	180	kJ/m2	8	55	69	35	22	20	15	9	8	5	4	19	14	11
	-20 °C/-4 °F	180	kJ/m2	8	15	20	14	12	10	9	8	8	5	4	10	12	10

PROPERTIES	CONDITION	ISO	UNIT	FR GRADES				H GRADES		PEEK GRADES				LCP GRADES			FLEX GRADES		
				PPE400FR	PPE700FR	PPE950FR	PPE1200FR	H1500HF	H2300HF	PEEK700	PEEK900	PEEK1000	PEEK1200	LCP650	LCP800	LCP950	FLX400	FLX700	FLX1100
Dielectric Constant (Dk)	2.4 GHz			4.0	7.0	9.5	12.0	15.0	23.0	7.0	9.0	10.0	12.0	6.5	8.0	9.5	4.0	7.0	11.0
Loss Tangent (Df)	2.4 GHz			0.0030	0.0039	0.0042	0.0045	0.0010	0.0037	0.0024	0.0025	0.0024	0.0027	0.0043	0.0045	0.0047	0.0010	0.0009	0.0012
Density		1183	g/cm3	1.44	1.97	2.20	2.50	2.60	3.40	1.94	2.20	2.30	2.40	2.00	2.15	2.30	1.52	1.93	2.50
Melt Flow Index (MFI)	5 kg, 300 °C (unless noted)	1113	g/10 min	17	12	13	5	5	8	15 @ 380 °C	13 @ 380 °C	10 @ 380 °C	6	-	-	-	11 @ 230 °C	2 @ 230 °C	0.3 @ 230 °C
Tensile Strength at Break	23 °C/73 °F	527	MPa	47	52	44	45	23	40	64	62	65	67	75	80	75	11	17	25
Flexural Modulus	23 °C/73 °F	178	MPa	3100	4500	-	9300	2100	5000	6200	7600	9200	11000	8000	8500	8500	1400	1600	2900
Unnotched Izod	23 °C/73 °F	180	kJ/m2	NB	42	20	9	17	10	28	25	18	15	31	20	12	NB	NB	NB
	-20 °C/-4 °F	180	kJ/m2	-	-	-	-	17	10	-	-	-	-	-	-	-	-	-	-
Notched Izod	23 °C/73 °F	180	kJ/m2	14	6	4	3	5	4	6	4	4	4	10	6	4	59	23	13
	-20 °C/-4 °F	180	kJ/m2	-	-	-	-	5	4	-	-	-	-	-	-	-	-	-	-

## EDGETEK™ 7600 SERIES

PROPERTIES	CONDITION	ISO	UNIT	8027	8025	8037	8019	8028	8026	8044	8029	8041	8045	8048	8036	8056	8031
Dielectric Constant (Dk)	1 GHz, 23 °C			3.0	3.1	3.4	3.6	3.8	4.4	4.8	5.3	5.4	5.9	6.0	7.0	7.3	9.0
Loss Tangent (Df)	1 GHz, 23 °C			0.0012	0.0012	0.0008	0.0010	0.0010	0.0010	0.0004	0.0008	0.0006	0.0002	0.0006	0.0007	0.0002	0.0007
Density		1183	g/cm3	1.25	1.26	1.35	1.39	1.45	1.59	1.72	1.75	1.79	1.89	1.88	2.06	2.086	2.25
Melt Flow Index (MFI)	5 kg, 300 °C	1113	g/10 min	16	19	10	11	15	13	10	10	15	15	19	10	18	4.7
Tensile Strength at Break	23 °C/73 °F	527	MPa	59	54	54	62	59	54	52	58	52	45	49	45	37	38
Flexural Modulus	23 °C/73 °F	178	MPa	2780	2560	2850	3060	3350	3700	3157	4300	4320	3137	4150	3370	2560	4200
Notched Izod	23 °C/73 °F	180	kJ/m2	15.3	14	14.8	14	12.6	10.4	9.9	8.6	7.4	7.9	6.6	7.1	6.2	6.8





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