



## ULTEM™ Resin 4000

### Americas: COMMERCIAL

Glass fiber, PTFE, and Graphite filled, standard flow Polyetherimide (Tg 217°C). ECO Conforming, UL94 V0 listing.

TYPICAL PROPERTIES <sup>1</sup>	TYPICAL VALUE	Unit	Standard
<b>MECHANICAL</b>			
Tensile Stress, brk, Type I, 5 mm/min	840	kgf/cm <sup>2</sup>	ASTM D 638
Tensile Strain, brk, Type I, 5 mm/min	1.2	%	ASTM D 638
Flexural Stress, yld, 2.6 mm/min, 100 mm span	1160	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Stress, brk, 2.6 mm/min, 100 mm span	1400	kgf/cm <sup>2</sup>	ASTM D 790
Flexural Modulus, 2.6 mm/min, 100 mm span	89900	kgf/cm <sup>2</sup>	ASTM D 790
Hardness, Rockwell M	85	-	ASTM D 785
Taber Abrasion, CS-17, 1 kg	33	mg/1000cy	ASTM D 1044
PV Limit, 0.51 m/s	2.1	MPa-m/s	SABIC Method
K-factor xE-10, PV=2000 psi-fpm vs Steel	62	-	SABIC Method
K-factor xE-10, PV=2000 psi-fpm vs Self	1900	-	SABIC Method
Coefficient of Friction on steel, Static	0.25	-	ASTM D 1894
Coefficient of Friction on steel, Kinetic	0.24	-	ASTM D 1894
<b>IMPACT</b>			
Izod Impact, unnotched, 23°C	16	cm-kgf/cm	ASTM D 4812
Izod Impact, notched, 23°C	6	cm-kgf/cm	ASTM D 256
Izod Impact, Reverse Notched, 3.2 mm	17	cm-kgf/cm	ASTM D 256
<b>THERMAL</b>			
Vicat Softening Temp, Rate B/50	233	°C	ASTM D 1525
HDT, 1.82 MPa, 6.4 mm, unannealed	212	°C	ASTM D 648
CTE, -40°C to 40°C, flow	1.62E-05	1/°C	ASTM E 831
CTE, -20°C to 150°C, flow	1.62E-05	1/°C	ASTM E 831
Relative Temp Index, Elec	105	°C	UL 746B
Relative Temp Index, Mech w/impact	105	°C	UL 746B

(1) Typical values only. Variations within normal tolerances are possible for various colors. All values are measured after at least 48 hours storage at 23°C/50% relative humidity. All properties, except the melt volume and melt flow rates, are measured on injection molded samples. All samples tested under ISO test standards are prepared according to ISO 294.

(2) Only typical data for selection purposes. Not to be used for part or tool design.  
(3) This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

(4) Internal measurements according to UL standards.

(5) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article.

(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

Source GMD, last updated:

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<b>THERMAL</b>			
Relative Temp Index, Mech w/o impact	105	°C	UL 746B
<b>PHYSICAL</b>			
Specific Gravity	1.67	-	ASTM D 792
Water Absorption, 24 hours	0.11	%	ASTM D 570
Mold Shrinkage, flow, 3.2 mm (5)	0.2 - 0.3	%	SABIC Method
Melt Flow Rate, 337°C/6.6 kgf	3.1	g/10 min	ASTM D 1238
<b>ELECTRICAL</b>			
Comparative Tracking Index (UL) (PLC)	4	PLC Code	UL 746A
<b>FLAME CHARACTERISTICS</b>			
UL Recognized, 94V-0 Flame Class Rating (3)	0.83	mm	UL 94

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(6) Needs hard coat to consistently pass 60 sec Vertical Burn.

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PROCESSING PARAMETERS	TYPICAL VALUE	Unit
<b>Injection Molding</b>		
Drying Temperature	135	°C
Drying Time	4 - 6	hrs
Drying Time (Cumulative)	10	hrs
Maximum Moisture Content	0.02	%
Melt Temperature	350 - 370	°C
Nozzle Temperature	350 - 370	°C
Front - Zone 3 Temperature	350 - 370	°C
Middle - Zone 2 Temperature	345 - 365	°C
Rear - Zone 1 Temperature	340 - 360	°C
Mold Temperature	135 - 165	°C
Back Pressure	0.3 - 0.7	MPa
Screw Speed	40 - 70	rpm
Shot to Cylinder Size	40 - 60	%
Vent Depth	0.025 - 0.076	mm

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