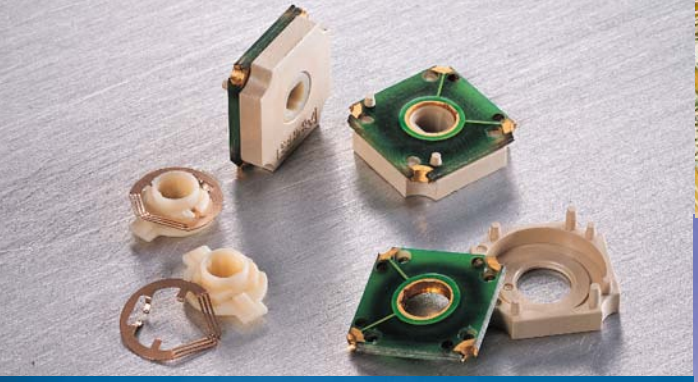

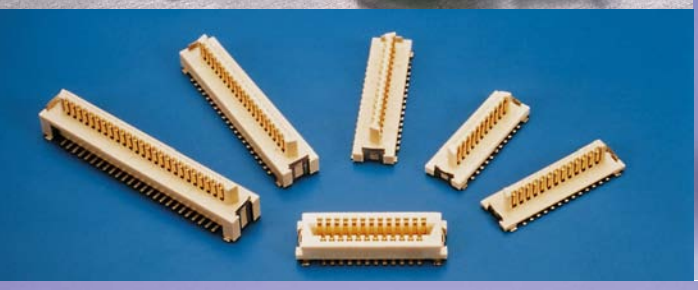

DuPont™ Zenite® LCP
liquid crystal polymer resin

PRODUCT AND PROPERTY GUIDE

DUPONT®

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DuPont™ Zenite® LCP liquid crystal polymer resin

Description

Zenite® is the DuPont trademark for its liquid crystal polymer (LCP) resins. Zenite® 5000, 6000, 7000 and 9000HT series LCP resins are wholly aromatic polyester resins and are easily processed. The materials feature excellent dimensional stability and creep resistance — even at very high temperatures. In the molten state, the polymer's rod-like molecules are somewhat aligned. With processing shear stresses, the molecular alignment is further enhanced. This, in turn, contributes to anisotropic properties — including superior physical properties over a wide temperature range, low thermal expansion, and low mold shrinkage — especially in the flow direction. Zenite® LCP resins are typically available as glass reinforced, mineral reinforced and glass/mineral reinforced grades.

Properties

Typical properties of Zenite® LCP resins are shown in **Table 4**. These materials combine high values of flexural modulus, heat deflection temperature and electrical insulation properties. Zenite® compositions are inherently flame retardant and are UL listed with V-0 flammability ratings. Outstanding dimensional stability is possible due to their very low coefficient of thermal expansion as shown in **Table 5**. Properties are further enhanced in thin wall sections due to an even higher degree of molecular alignment. This is depicted in **Figures 1** and **2**. Zenite® LCP resins are noted for their outstanding creep properties, which are illustrated in **Figures 3** and **4**. The ability of Zenite® LCP resins to significantly retain properties over a wide range of temperatures and time is illustrated in **Figures 5** and **6**. **Figure 7** illustrates the excellent fatigue resistance of Zenite® LCP and **Figure 8** shows its high dielectric strength performance over a wide temperature range.

In addition to their excellent thermal properties, Zenite® LCP resins have a high degree of resistance to a wide range of chemicals — including strong acids, bases, and hydrocarbons. **Tables 1**, **2** and **3** reflect this performance.

Applications

DuPont™ Zenite® LCP resins should be considered for applications requiring high temperature performance, retention of properties over a wide temperature range, dimensional stability, chemical resistance, and excellent electrical properties. These resins are well suited for use in automotive, electrical/electronic, fiber optics, telecommunication, and aerospace industries. Some typical applications include:

Connectors and sockets

Zenite® offers a superior combination of heat resistance in lead free soldering, good cavity filling even in fine pitch design, and dimensional stability. Zenite® 6130LX meets the general needs of connector applications and Zenite® 7130 meets more demanding dimension stability requirements for higher temperature applications. Other Zenite® specialty grades fit unique needs:

Zenite® 7244	Fine pitch connectors
Zenite® 5145L, ZE55201	Sockets, cardedge connectors

Bobbins

Zenite® LCP resins have UL94 V-0 flammability ratings for thin wall sections and DuPont EIS insulation system approvals which support design flexibility and fast commercialization of new bobbin applications. Also, the high temperature resistance of Zenite® LCP grades, such as Zenite® 9140HT, improves productivity in dip soldering applications.

Surface mounted device housings

With today's increasing need for high volume production, Zenite® performs with industry best-in-class productivity among all engineering plastics. Its excellent filling performance in multiple cavity tooling can improve tooling productivity and result in lower tooling costs. Zenite® is an environmentally friendly resin that is inherently flame retardant without the addition of halogenated chemicals and performs well in lead free soldering processes because of its heat resistance. Using Zenite® LCP in place of thermosets or ceramics can result in significant cost savings.

Lamp sockets

Zenite® has UL94 V-0 flammability with low outgassing and good heat resistance, not only short term, but also for long term use. Cost savings can be achieved with Zenite® LCP vs. ceramics through consolidated part design and improved yield through the assembly process because of superior toughness.

Printers and copier parts

Zenite® has a proven record of use in business machine applications such as the toner fuser system in plain paper printing or copying because of consistent processing, dimensional stability and heat resistance. Zenite® also fits well with today's environmental design direction as it is inherently flame retardant without the addition of halogenated chemicals.

For more information on Zenite® LCP contact your DuPont representative or visit our web site at www.plastics.dupont.com.

Zenite® Product Offering

5000 Series	Zenite® 5145L BK010 Zenite® 5145L WT010	45% glass reinforced, lubricated liquid crystal polymer resin with improved toughness and a heat deflection temperature of 290°C.*
6000 Series	Zenite® 6130 BK010 Zenite® 6130 WT010	30% glass reinforced liquid crystal polymer resin with a heat deflection temperature of 268°C.
	Zenite® 6130LX BK010 Zenite® 6130LX WT010	30% glass reinforced, lubricated liquid crystal polymer resin with improved weldline strength and a heat deflection temperature of 280°C.
	Zenite® 6140L BK010 Zenite® 6140L WT010	40% glass reinforced, lubricated liquid crystal polymer resin with high stiffness and a heat deflection temperature of 280°C.
	Zenite® 6330 BK010 Zenite® 6330 NC010	30% mineral reinforced liquid crystal polymer resin having excellent toughness and a heat deflection temperature of 245°C.
	Zenite® 6635 BK010	40% glass/mineral reinforced liquid crystal polymer resin having excellent flow and weldline strength.
7000 Series	Zenite® 7130 BK010 Zenite® 7130 WT010	30% glass reinforced liquid crystal polymer resin having excellent toughness and a heat deflection temperature of 310°C.*
	Zenite® 7145L BK010 Zenite® 7145L WT010	45% glass reinforced, lubricated liquid crystal polymer resin with high stiffness and a heat deflection temperature of 295°C.
	Zenite® 7244 BK010 Zenite® 7244 NC010	40% glass/mineral reinforced liquid crystal polymer resin with a heat deflection temperature of 295°C,* high flow and good flatness.
9000HT Series	Zenite® 9140HT BK010 Zenite® 9140HT NC010	40% glass reinforced liquid crystal polymer resin having an excellent heat deflection temperature of 356°C.*
Specialty Grades	Zenite® FG6330 NC011	30% mineral reinforced liquid crystal polymer resin with FDA approval for use in repeated food-contact applications.
	Zenite® FG7145L BK011	45% glass reinforced, lubricated liquid crystal polymer resin with FDA approval for use in repeated food-contact applications.
	Zenite® ZE16130A BK010 Zenite® ZE16130A WT010	30% glass reinforced liquid crystal polymer resin with excellent epoxy adhesion strength and a heat deflection temperature of 275°C.
	Zenite® ZE16401 BK010	5% PTFE and 30% mineral reinforced, reduced wear and reduced friction liquid crystal polymer resin.
	Zenite® ZE55201 BK010	50% glass/mineral reinforced, lubricated, black liquid crystal polymer resin designed for ultra flatness.
	Zenite® ZE55801 NC010	30% glass reinforced, lubricated liquid crystal polymer resin designed for enhanced electroless plating.

*Tested per ISO 75-1/-2 1993/N_2. All other heat deflection temperature values were measured per ISO 75-1/-2.

Figure 1. Zenite® 6130 BK010 Tensile Strength versus Temperature, ISO 527

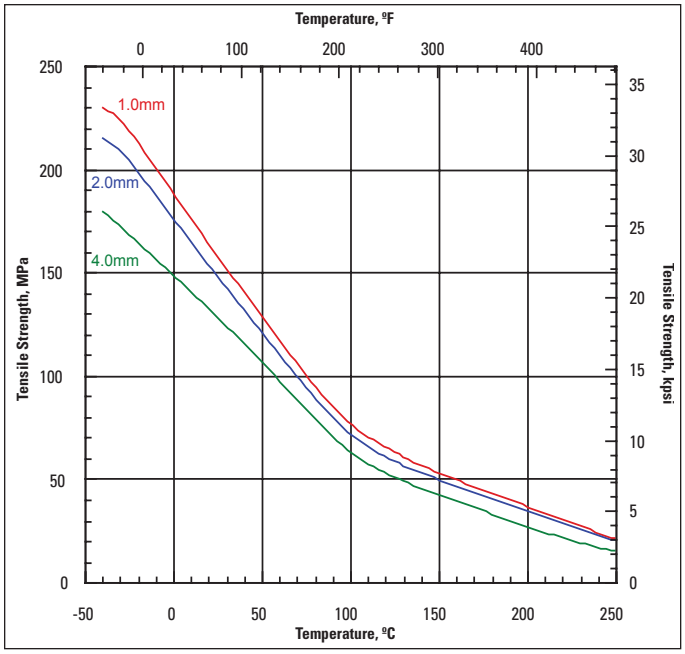


Figure 2. Zenite® 6130 BK010 Tensile Modulus versus Temperature, ISO 527

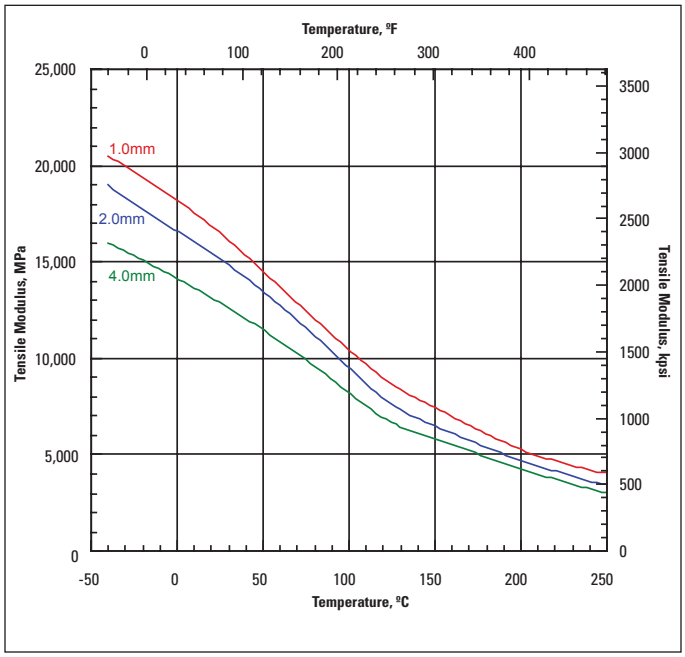
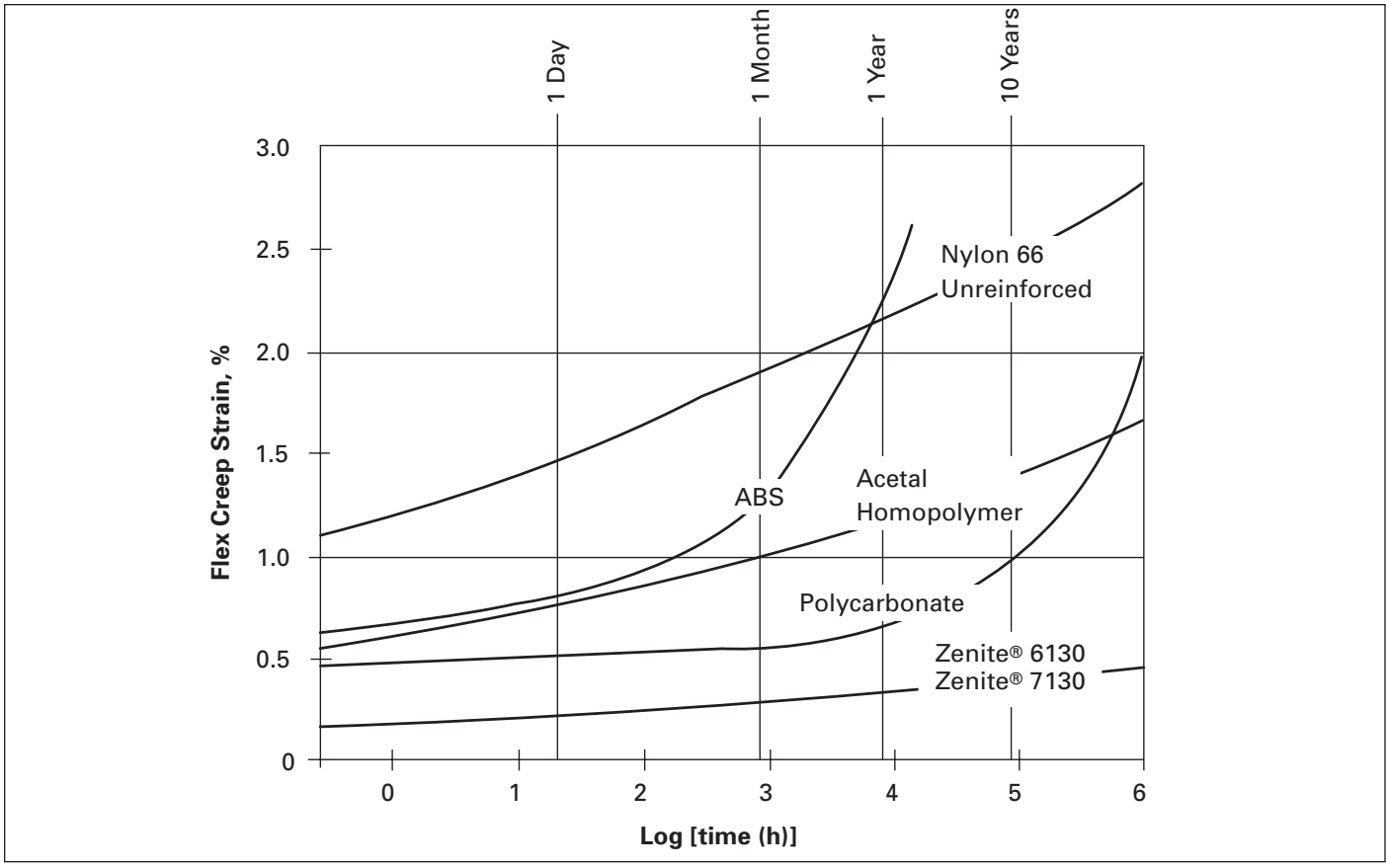
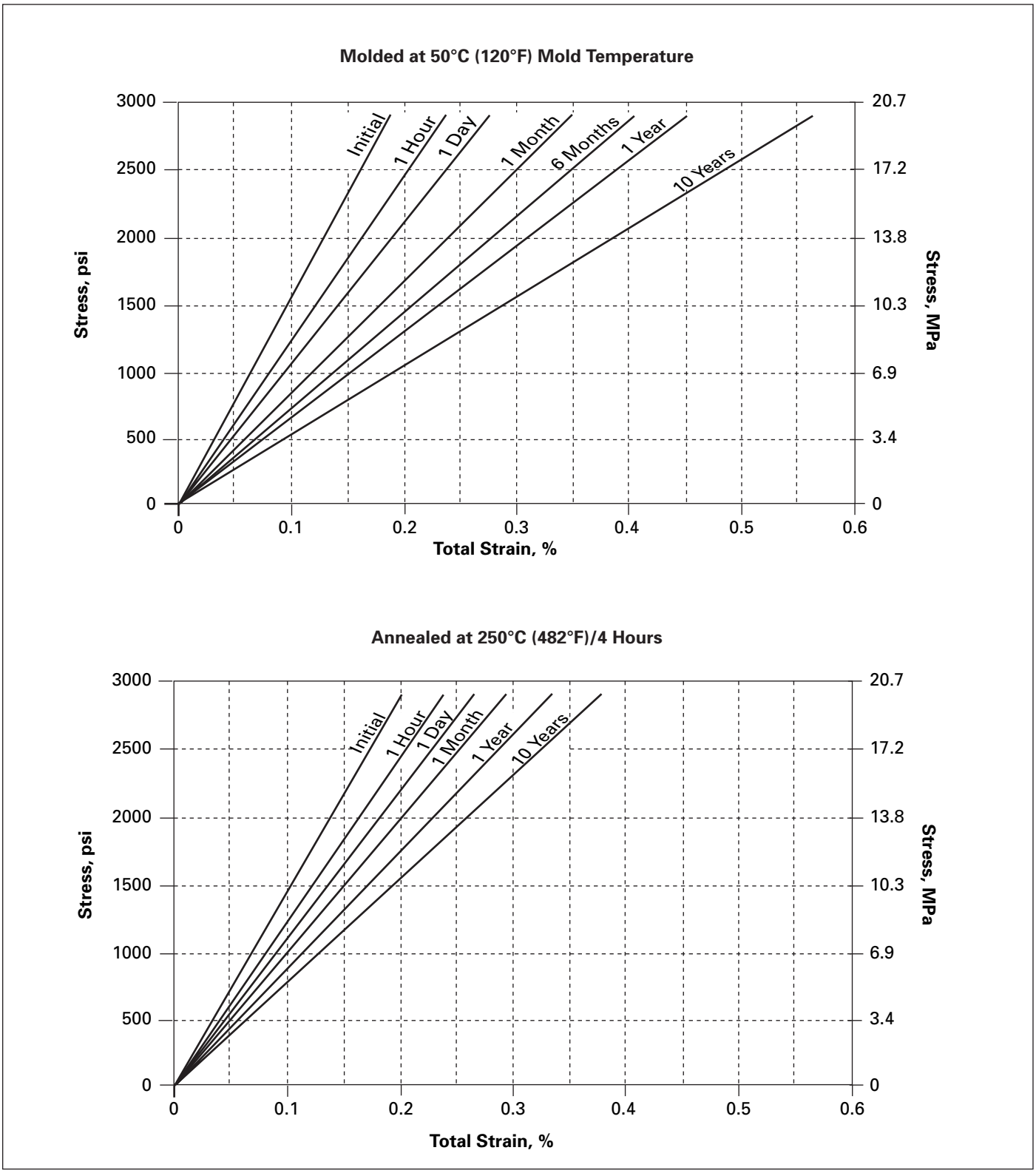


Figure 3. % Flex Creep Strain of 8–9 MPa (1300 psi at 31°C (88°F)*



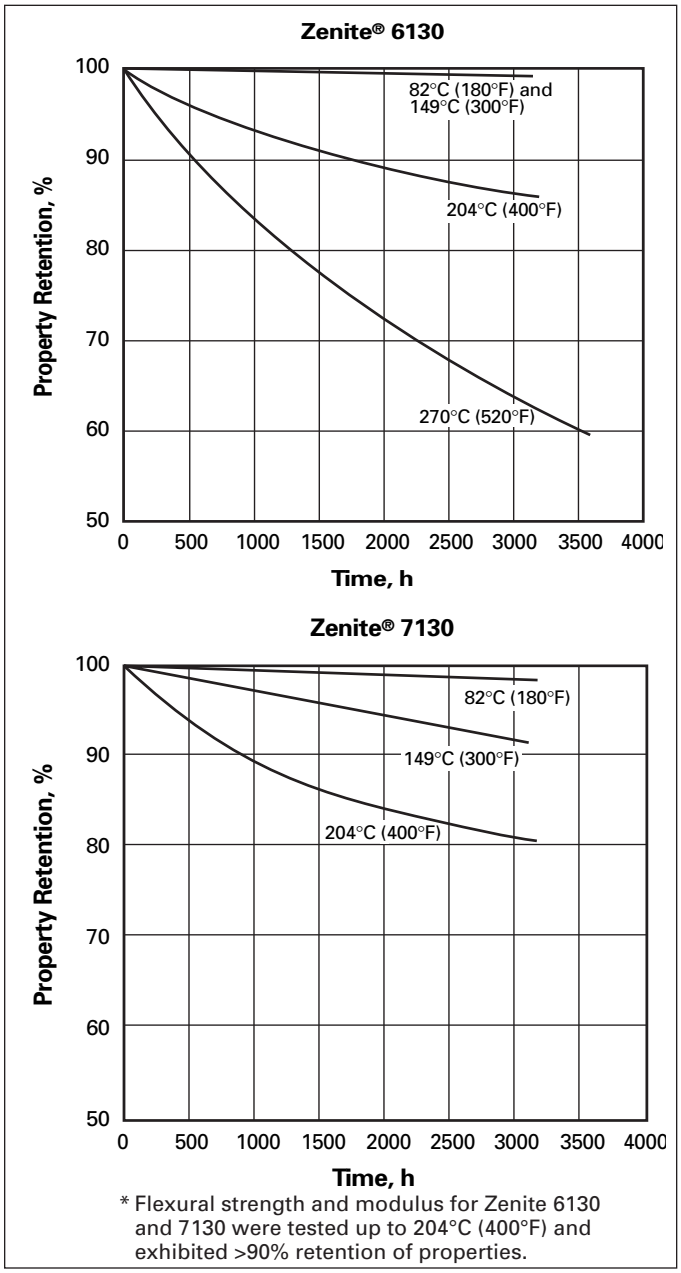
*DMA data

Figure 4. Isochronous Stress-Strain Curves—Zenite 6130 and Zenite 7130 at 100°C (212°F) for 0.79 mm (0.031 in) Thickness*



*DMA data

Figure 5. Tensile Strength* versus Heat and Time



* Flexural strength and modulus for Zenite 6130 and 7130 were tested up to 204°C (400°F) and exhibited >90% retention of properties.

Figure 6. Unnotched Izod versus Heat and Time

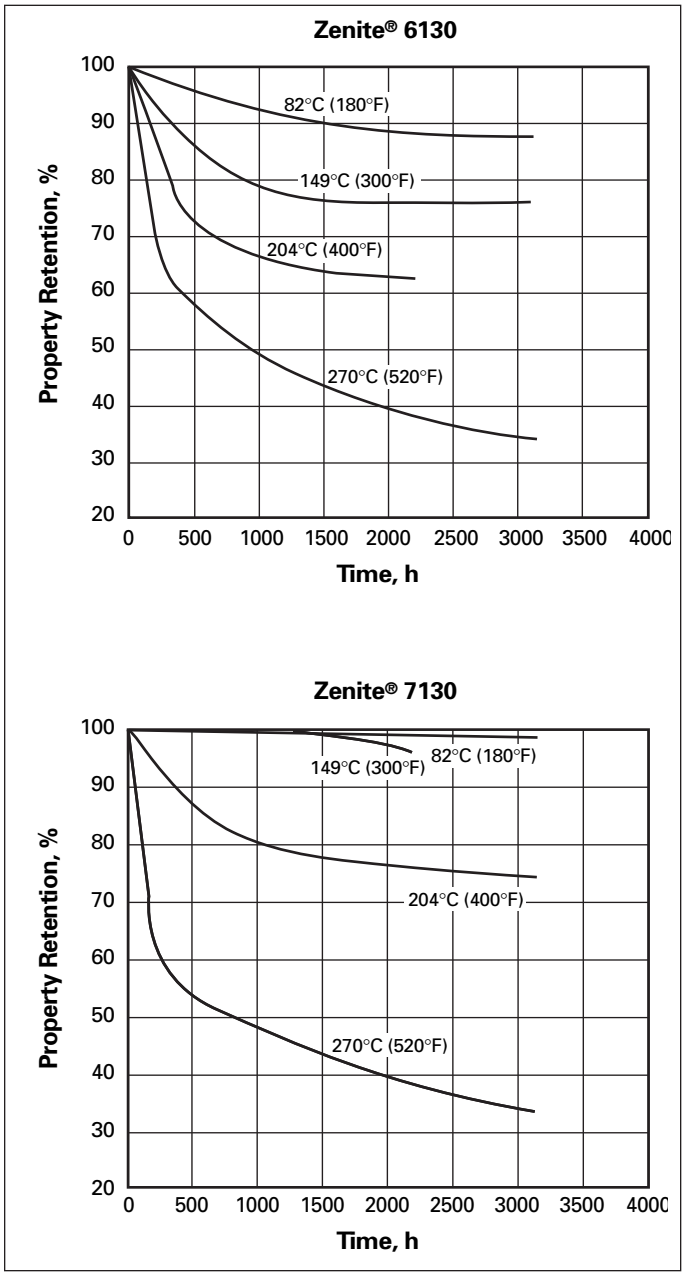


Figure 7. Flexural Fatigue Zenite® 6130

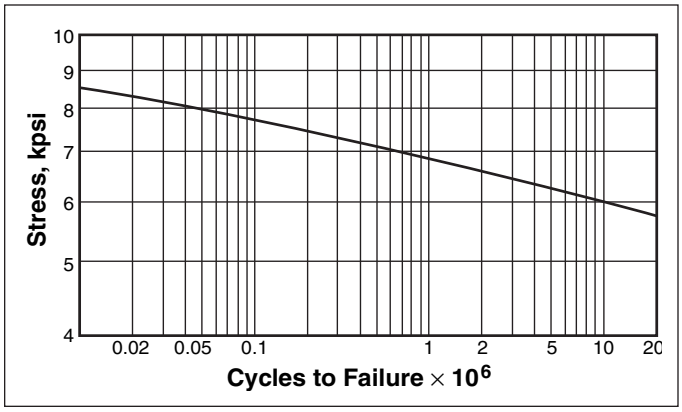


Figure 8. Dielectric Strength Zenite® 6130

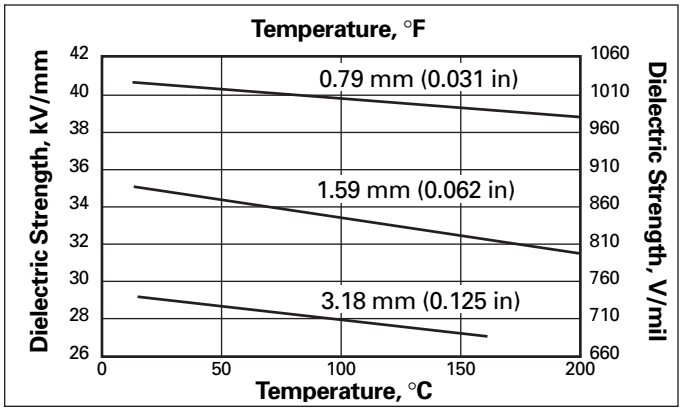


Table 1
Solvent Resistance—Automotive Fluids*
(2000 hours [83 days], 100% concentrations unless noted otherwise)

Solvent/ Trade Name	Temp., °C (°F)	Property Retention, %				Weight Change, %
		Zenite® Grade	Tensile Elongation	Flexural Modulus	Unnotched Izod Impact	
Antifreeze/ Prestone	104 (220)	6130 7130	100 78	51 49	75 57	<0.1 <0.2
Brake Fluid/ Champion Dot	104 (220)	6130 7130	95 78	70 89	100 83	<0.2 <0.2
Gasoline/ Indolene 98	82 (180)	6130 7130	86 86	100 95	91 94	<0.1 <0.2
Oil/ Castrol 20W30	104 (220)	6130 7130	82 86	91 96	89 91	<0.1 <0.2
Transmission Fluid (Automatic) GM Dextron II	104 (220)	6130 7130	86 86	99 95	93 77	<0.1 <0.2
Washer Fluid Tradco	82 (180)	6130 7130	86 86	95 84	98 94	<0.1
Zinc Chloride (Saturated Solution)	82 (180)	6130 7130	91 94	98 98	100 96	<0.1 <0.1

Table 2
Solvent Resistance—Electronic Industry Fluids*
(24 hours at 23°C [73°F], 100% concentrations unless noted otherwise)

Solvent/ Trade Name	Zenite® Grade	Property Retention, % (Flexural Modulus)	Weight Change, %	Dimension Change, %
Trichloroethylene	6130 7130	99 100	<0.1 <0.1	None None
Freon® TMC Cleaning Agent	6130 7130	96 100	<0.1 <0.1	None None
Axarel® 2200 Cleaning Agent (Replacement for Freon)	6130 7130	96 100	<0.2 <0.2	None None

*Specimen sizes are as spelled out in ASTM D638, D790, and D4812.

Table 3
Solvent Resistance—Automotive Fuels[1]
(3000 hours [125 days]

Solvent/ Trade Name	Temperature °C	Zenite® Grade	Property Retention, %		
			Tensile Elongation	Flexural Modulus	Izod Impact Strength (Unnotched)
100% Methanol	60	6130 7130	91 100	75 93	88 105
CM15[2]	60	6130 7130	113 89	80 90	82 107
CM15A[3]	60	6130 7130	117 100	68 100	72 98
CM15P[4]	60	6130 7130	117 100	67 77	76 98

[1] Tested per SAE Cooperative Reserach Report, September 1990, 90-0868EG.
[2] 15% methanol/85% reference gasoline.
[3] 15% Aggressive methanol/85% reference gasoline.
[4] Auto-oxidized CM15.

Processing

The viscosity of Zenite® LCP resins varies with the shear rate utilized. They are easily processed by most thermoplastic techniques. In injection molding, they can easily fill long, thin wall sections and exhibit no flash. Figure 9 is typical snake flow data that is somewhat indicative of melt flow lengths possible in molding at 0.51 mm (0.020 in) thickness. Due to the high freezing point and low heat of fusion, the cycle time for these resins is significantly better—usually one-half that of conventional crystalline resins—thus offering key improvements to productivity. These resins exhibit excellent melt stability. This allows wide processing ranges when molding both virgin and regrind resins. The very high retention of physical properties in regrind (as seen in Figure 10) offers significant cost savings for processors of these resins. In addition to their excellent dimensional stability, the very low mold shrinkage of these resins is a plus factor in tool design and design tolerances.

Recommendations regarding processing conditions are found in the Zenite® Molding Guide, and from your DuPont representative or any office listed on the back of this brochure.

Figure 9. Flow versus Pressure
0.5 mm (0.020 in) Thickness
12.7 mm (0.500 in) Width

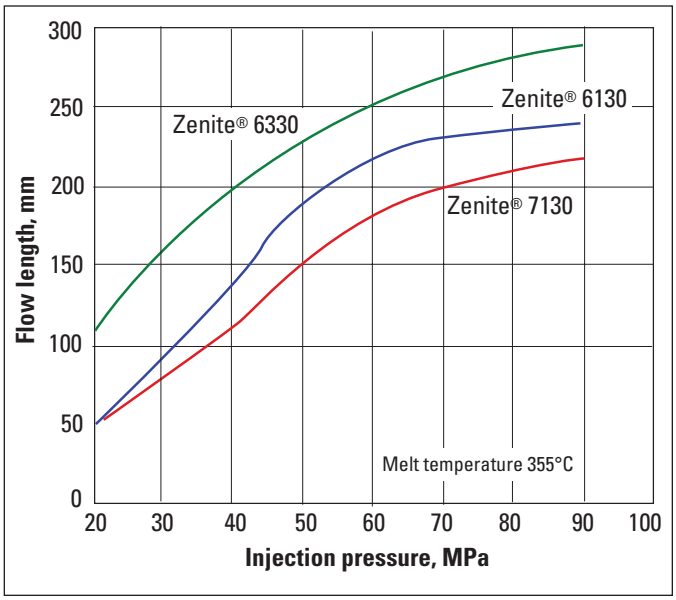


Figure 10. Property Retention Zenite® 6130, 100% Regrind—6 Passes

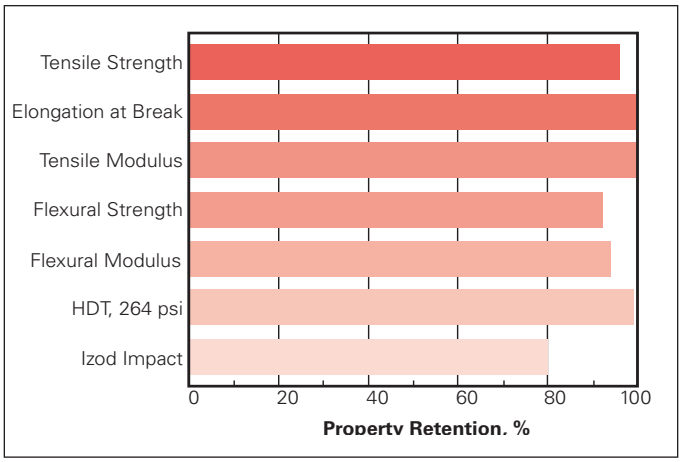


Table 5
Coefficient of Linear Thermal Expansion, ISO 11359-1/-2

		Zenite® 5145L	Zenite® 6130		Zenite® 6130LX		Zenite® 6140L		Zenite® 6330		Zenite® 7130		Zenite® 7145L		Zenite® 7244	
		4mm	2mm	4mm	2mm	4mm	2mm	4mm	2mm	4mm	2mm	4mm	2mm	4mm	2mm	4mm
CLTE, Parallel (Flow)																
–40–23°C (–40–73°F)	E-4/C	0.04	0.02	0.04	0.03	0.05	0.02	0.04	0.04	0.07	0.01	0.02	0.03	0.04	0.05	0.05
	E-4/F	0.02	0.01	0.02	0.02	0.03	0.01	0.02	0.02	0.04	0.01	0.01	0.02	0.02	0.03	0.03
23–55°C (73–130°F)	E-4/C	0.05	0.02	0.04	0.04	0.05	0.03	0.04	0.05	0.08	0.01	0.03	0.04	0.05	0.06	0.06
	E-4/F	0.03	0.01	0.02	0.02	0.03	0.02	0.02	0.03	0.04	0.01	0.02	0.02	0.03	0.03	0.03
55–160°C (130–320°F)	E-4/C	0.07	0.02	0.04	0.04	0.06	0.03	0.05	0.05	0.10	0	0.02	0.03	0.05	0.06	0.07
	E-4/F	0.04	0.01	0.02	0.02	0.03	0.02	0.03	0.03	0.06	0	0.01	0.02	0.03	0.03	0.04
160–260°C (320–500°F)	E-4/C	0	–0.05	–0.01	0	0.06	0	0.02	–0.04	0.10	–0.04	–0.04	0	0.03	0.03	0.04
	E-4/F	0	–0.03	–0.01	0	0.03	0	0.01	–0.02	0.06	–0.02	–0.02	0	0.02	0.02	0.02
–40–260°C (–40–500°F)	E-4/C	0.04	0.01	0.02	0.03	0.06	0.02	0.04	0.03	0.10	–0.01	0.02	0.03	0.04	0.06	0.06
	E-4/F	0.02	0.01	0.01	0.02	0.03	0.01	0.02	0.02	0.06	–0.01	0.01	0.02	0.02	0.03	0.03
CLTE, Normal (Transverse)																
–40–23°C (–40–73°F)	E-4/C	0.52	0.60	0.61	0.48	0.55	0.53	0.56	0.34	0.34	0.60	0.54	0.52	0.51	0.32	0.34
	E-4/F	0.29	0.33	0.34	0.27	0.31	0.29	0.31	0.19	0.19	0.33	0.30	0.29	0.28	0.18	0.19
23–55°C (73–130°F)	E-4/C	0.62	0.68	0.70	0.55	0.62	0.61	0.64	0.40	0.38	0.68	0.62	0.60	0.60	0.35	0.39
	E-4/F	0.34	0.38	0.39	0.31	0.34	0.34	0.36	0.22	0.21	0.38	0.34	0.33	0.33	0.19	0.22
55–160°C (130–320°F)	E-4/C	0.83	0.88	0.92	0.71	0.80	0.78	0.82	0.44	0.51	0.86	0.80	0.76	0.76	0.45	0.49
	E-4/F	0.46	0.49	0.51	0.39	0.44	0.43	0.46	0.24	0.28	0.48	0.44	0.42	0.42	0.25	0.27
160–260°C (320–500°F)	E-4/C	1.00	1.01	1.07	0.80	0.92	0.88	0.94	0.46	0.62	1.02	0.94	0.86	0.85	0.48	0.55
	E-4/F	0.56	0.56	0.59	0.44	0.51	0.49	0.52	0.26	0.34	0.57	0.52	0.48	0.47	0.27	0.31
–40–260°C (–40–500°F)	E-4/C	0.80	0.85	0.88	0.68	0.76	0.75	0.79	0.37	0.50	0.83	0.79	0.72	0.72	0.42	0.47
	E-4/F	0.44	0.47	0.49	0.38	0.42	0.42	0.44	0.21	0.28	0.46	0.44	0.40	0.40	0.23	0.26

Table 4
DuPont™ Zenite®
Product and Properties Guide

	Property			Method	Units	ZENITE 5145L BK010	ZENITE 5145L WT010	ZENITE 6130 BK010	ZENITE 6130 WT010
	Resin Identification			ISO 1043		LCP-GF45	LCP-GF45	LCP-GF30	LCP-GF30
	Part Marking Code			ISO 11469		>LCP-GF45<	>LCP-GF45<	>LCP-GF30<	>LCP-GF30<
Mechanical	Stress at Break			ISO 527	MPa	115	115	130	130
					kpsi	16.7	16.7	18.9	18.9
	Strain at Break			ISO 527	%	3.1	3.3	2	2.2
	Tensile Modulus			ISO 527	MPa	15000	13000	13000	13500
					kpsi	2180	1890	1890	1960
	Shear Strength		0.8mm	ASTM D 732	MPa				68
			0.031in		kpsi				9.8
			3.2mm		MPa				51
			0.125in		kpsi				7.4
	Flexural Modulus			ISO 178	MPa	11000	10000	11000	11000
					kpsi	1600	1450	1600	1600
	Flexural Strength			ISO 178	MPa	190	180	190	190
					kpsi	27.6	26.1	27.6	27.6
	Compressive Strength			ASTM D 695	MPa				105
					kpsi				15.2
	Compressive Modulus			ASTM D 695	MPa				6900
					kpsi				1000
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%				0.04
	Izod Impact		23ºC	ASTM D 256	J/m	250	250		125
			73ºF		ft lb/in	4.7	4.7		2.4
	Unnotched Impact		-40ºC	ASTM D 4812	J/m				440
			-40ºF		ft lb/in				8.2
			23ºC		J/m	600	500		655
			73ºF		ft lb/in	11.3	9.4		12.3
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2			30	25
			23ºC, (73ºF)					35	35
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2			30	25
			23ºC, (73ºF)					40	35
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C			268	268
					F			514	514
	Deflection Temperature		1.80MPa		C	290	290		
				ISO 75-1/-2 1993/N2	F	554	554		
	Melting Temperature		10°C/min	ISO 11357-1/-3	C	319	319	335	335
					F	606	606	635	635
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C			0.02	0.02
			23-160°C (73-320°F), 4mm			0.07	0.07	0.04	0.04
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C			-0.05	-0.05
			160-260°C (320-500°F), 4mm			0	0	-0.01	-0.01
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C			0.83	0.83
			23-160°C (73-320°F), 4mm			0.78	0.78	0.87	0.87
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C			1.01	1.01
			160-260°C (320-500°F), 4mm			1.00	1.00	1.07	1.07
	Glass Transition Temperature		10°C/min	ISO 11357-1/-2	C			120	120
					F			250	250
	Extrapolated End Melt Temp.			ASTM D 3418	C				350
					F				662
	Thermal Conductivity			ASTM C 177	W/mºK				0.27
					Btu in/h ft2ºF				1.9
Electrical	Surface Resistivity			ASTM D 257	ohm	1E15	1E15		1E16
	Surface Resistivity			IEC 60093	ohm			1E16	
	Volume Resistivity			ASTM D 257	ohm cm	1E15	1E15		1E17
	Volume Resistivity			IEC 60093	ohm m			1E14	
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm				40
			73ºF		V/mil				1020
			120ºC		kV/mm				41
			250ºF		V/mil				1040
			150ºC		kV/mm				37
			300ºF		V/mil				950
			200ºC		kV/mm				40
			390ºF		V/mil				1020
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm				35
			73ºF		V/mil				900
			120ºC		kV/mm				33
			250ºF		V/mil				840
			150ºC		kV/mm				31
			300ºF		V/mil				790
			200ºC		kV/mm				33
			390ºF		V/mil				840
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm	22	22		29
			73ºF		V/mil	560	560		740
			120ºC		kV/mm				28
			250ºF		V/mil				710
			150ºC		kV/mm				27
			300ºF		V/mil				690
			200ºC		kV/mm				
			390ºF		V/mil				

Test temperatures are 23°C (73°F) unless otherwise stated.

DuPont™ Zenite®
Product and Properties Guide

	Property			Method	Units	ZENITE 5145L BK010	ZENITE 5145L WT010	ZENITE 6130 BK010	ZENITE 6130 WT010
Electrical	Dielectric Strength, Step by Step	0.8mm	23ºC	ASTM D 149	kV/mm				30
			73ºF		V/mil				760
	Dielectric Strength, Step by Step	1.6mm	23ºC	ASTM D 149	kV/mm				29
			73ºF		V/mil				740
	Dielectric Strength, Step by Step	3.2mm	23ºC	ASTM D 149	kV/mm				26
			73ºF		V/mil				660
	Electric Strength	1.0mm	23ºC	IEC 60243-1	kV/mm	45		36	
			73ºF		V/mil	1140		920	
			100ºC		kV/mm	40			
			212ºF		V/mil	1020			
			150ºC		kV/mm	40			
			300ºF		V/mil	1020			
			200ºC		kV/mm	35			
			390ºF		V/mil	900			
	Electric Strength	2.0mm	23ºC	IEC 60243-1	kV/mm			29	
			73ºF		V/mil			740	
			100ºC		kV/mm	27			
			212ºF		V/mil	690			
			150ºC		kV/mm	24			
			300ºF		V/mil	610			
			200ºC		kV/mm	24			
			390ºF		V/mil	610			
	Dielectric Constant	60 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
			200ºC, (390ºF)						
	Dielectric Constant	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					4.0
			120ºC, (250ºF)						4.5
			150ºC, (300ºF)						4.5
			200ºC, (390ºF)						4.5
	Dielectric Constant	1E3 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.4	3.4		4.4
			120ºC, (250ºF)						5.0
			150ºC, (300ºF)						5.0
			200ºC, (390ºF)						5.0
	Dielectric Constant	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.3	3.3		
	Dielectric Constant	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.3	3.3		
	Dielectric Constant	1E6 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					3.6
			120ºC, (250ºF)						4.3
			150ºC, (300ºF)						4.4
			200ºC, (390ºF)						4.4
	Dielectric Constant	1E6 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.2	3.2		3.9
			120ºC, (250ºF)						4.8
			150ºC, (300ºF)						4.8
			200ºC, (390ºF)						4.9
	Dielectric Constant	1E09 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B					4.4
			120ºC, (250ºF)						4.4
			150ºC, (300ºF)						4.4
			200ºC, (390ºF)						4.5
	Dielectric Constant	1E09 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					4.3
			120ºC, (250ºF)						4.4
			150ºC, (300ºF)						4.4
			200ºC, (390ºF)						4.5
	Dielectric Constant	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.7		4.7	
	Dielectric Constant	1E09 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					4.3
			120ºC, (250ºF)						4.4
			150ºC, (300ºF)						4.4
			200ºC, (390ºF)						4.5
			250ºC, (480ºF)						4.8
	Dielectric Constant	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				4.5	
	Dielectric Constant	1E10 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.8		4.8	
	Dielectric Constant	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				4.6	
	Dielectric Constant	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		5.0			

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	Property			Method	Units	ZENITE 5145L BK010	ZENITE 5145L WT010	ZENITE 6130 BK010	ZENITE 6130 WT010
Electrical	Relative Permittivity	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250				4.5	
	Relative Permittivity	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250				4.2	
			100ºC, (212ºF)					4.6	
			150ºC, (300ºF)					4.6	
			200ºC, (390ºF)					4.6	
	Relative Permittivity	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250				4.0	
			100ºC, (212ºF)					4.3	
			150ºC, (300ºF)					4.3	
			200ºC, (390ºF)					4.3	
	Dissipation Factor	60 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
			200ºC, (390ºF)						
	Dissipation Factor	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E3 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					0.013
			120ºC, (250ºF)						0.008
			150ºC, (300ºF)						0.009
			200ºC, (390ºF)						0.015
	Dissipation Factor	1E3 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.017	0.017		0.013
			120ºC, (250ºF)						0.006
			150ºC, (300ºF)						0.007
			200ºC, (390ºF)						0.014
	Dissipation Factor	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.012	0.012		
	Dissipation Factor	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.016	0.016		
	Dissipation Factor	1E6 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					0.026
			120ºC, (250ºF)						
			150ºC, (300ºF)						0.016
			200ºC, (390ºF)						0.010
	Dissipation Factor	1E6 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.015	0.015		0.027
			120ºC, (250ºF)						0.032
			150ºC, (300ºF)						0.018
			200ºC, (390ºF)						0.009
	Dissipation Factor	1E09 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B					0.004
			120ºC, (250ºF)						0.012
			150ºC, (300ºF)						0.018
			200ºC, (390ºF)						0.025
	Dissipation Factor	1E09 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					0.004
			120ºC, (250ºF)						0.014
			150ºC, (300ºF)						0.020
			200ºC, (390ºF)						0.028
	Dissipation Factor	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.006		0.009	
	Dissipation Factor	1E09 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					0.004
			120ºC, (250ºF)						0.016
			150ºC, (300ºF)						0.023
			200ºC, (390ºF)						0.032
			250ºC, (480ºF)						0.034
	Dissipation Factor	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				0.009	
	Dissipation Factor		23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.006		0.011	
	Dissipation Factor	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor	1E10 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				0.010	
	Dissipation Factor	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.008			
	Dissipation Factor	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4			150	
	Dissipation Factor	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4			160	
			100ºC, (212ºF)					100	
			150ºC, (300ºF)					100	
			200ºC, (390ºF)					130	
	Dissipation Factor	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4			310	
			100ºC, (212ºF)					450	
			150ºC, (300ºF)					180	
			200ºC, (390ºF)					70	
	CTI			IEC 60112	V	175		175	
	CTI			UL 746A	V			100-174	100-174

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property		Method	Units	ZENITE 5145L BK010	ZENITE 5145L WT010	ZENITE 6130 BK010	ZENITE 6130 WT010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.8	0.8	0.19	0.38
	Flammability Classification		UL94		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.8	0.8	0.19	0.38
	Oxygen Index		ASTM D 2863	%				38
	Oxygen Index		ISO 4589-1/-2	%			41	
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C				
		1.5mm						
		3.0mm						
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C				
		1.5mm						
		3.0mm						
	High Amperage Arc Ignition	0.3mm	UL 746A	arcs				
	Resistance	0.75mm						
		1.5mm						
		3.0mm						
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C			240	240
		0.8mm			130	130		
		1.5mm					240	240
	RTI, Impact	0.75mm	UL 746B	C			220	220
		0.8mm			130	130		
		1.5mm					220	220
	RTI, Strength	0.75mm	UL 746B	C			240	240
		0.8mm			130	130		
		1.5mm					240	240
Other	Density		ISO 1183	kg/m3	1750	1770	1620	1680
				g/cm3	1.75	1.77	1.62	1.68
	Hardness, Rockwell	Scale M	ASTM D 785					61
		Scale R						108
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg				49
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%				0.002
		Immersion, 10000h						0.08
		Immersion, 24h						
	UL Regrind Approval		UL 746D	%	50	50	50	50
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%	0.09		0.05	
		Normal, 2.0mm			0.5		0.8	
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%				-0.07
		Transverse, 0.8mm						0.5
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%				-0.07
		Transverse, 1.6mm						0.8
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%				-0.07
		Transverse, 3.2mm						0.5
Processing	Melt Temperature Range			C	325-345	325-345	350-360	350-360
				F	620-650	620-650	660-680	660-680
	Melt Temperature Optimum			C	335	335	355	355
				F	635	635	670	670
	Mold Temperature Range			C	40-150	40-150	40-150	40-150
				F	105-300	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80	80
				F	175	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3	3
	Drying Temperature			C	150	150	150	150
				F	304	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01	<0.01

RTI values of 130°C are assigned by UL based on resin family, not as a result of a testing program.

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	Property			Method	Units	ZENITE 6130LX BK010	ZENITE 6130LX WT010	ZENITE 6140L BK010	ZENITE 6140L WT010
	Resin Identification			ISO 1043		LCP-GF30	LCP-GF30	LCP-GF40	LCP-GF40
	Part Marking Code			ISO 11469		>LCP-GF30<	>LCP-GF30<	>LCP-GF40<	>LCP-GF40<
Mechanical	Stress at Break			ISO 527	MPa	145	145	130	125
					kpsi	21.0	21.0	18.9	18.1
	Strain at Break			ISO 527	%	1.8	2	1.1	1.3
	Tensile Modulus			ISO 527	MPa	15000	15000	17000	17300
					kpsi	2180	2180	2470	2510
	Shear Strength		0.8mm	ASTM D 732	MPa				
			0.031in		kpsi				
			3.2mm		MPa				
			0.125in		kpsi				
	Flexural Modulus			ISO 178	MPa	12800	12500	16500	14500
					kpsi	1860	1810	2390	2100
	Flexural Strength			ISO 178	MPa	220	220	190	200
					kpsi	31.9	31.9	27.6	29.0
	Compressive Strength			ASTM D 695	MPa				
					kpsi				
	Compressive Modulus			ASTM D 695	MPa				
					kpsi				
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%				
	Izod Impact		23ºC	ASTM D 256	J/m	107		112	
			73ºF		ft lb/in	2.0		2.1	
	Unnotched Impact		-40ºC	ASTM D 4812	J/m				
			-40ºF		ft lb/in				
			23ºC		J/m				
			73ºF		ft lb/in				
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2			15	15
			23ºC, (73ºF)			20	20	15	14
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2			20	18
			23ºC, (73ºF)			40		23	20
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C	280	280	280	280
					F	536	536	536	536
	Deflection Temperature		1.80MPa		C				
				ISO 75-1/-2 1993/N2	F				
	Melting Temperature		10°C/min	ISO 11357-1/-3	C	335	335	335	335
					F	635	635	635	635
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.04	0.04	0.03	0.03
			23-160°C (73-320°F), 4mm			0.06	0.06	0.05	0.05
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	0	0	0	0
			160-260°C (320-500°F), 4mm			0.06	0.06	0.02	0.02
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.67	0.67	0.74	0.74
			23-160°C (73-320°F), 4mm			0.76	0.76	0.78	0.78
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	0.80	0.80	0.88	0.88
			160-260°C (320-500°F), 4mm			0.92	0.92	0.94	0.94
	Glass Transition Temperature		10°C/min	ISO 11357-1/-2	C			120	
					F			250	
	Extrapolated End Melt Temp.			ASTM D 3418	C			350	
					F			662	
	Thermal Conductivity			ASTM C 177	W/mºK				
					Btu in/h ft2ºF				
Electrical	Surface Resistivity			ASTM D 257	ohm				
	Surface Resistivity			IEC 60093	ohm	1E16		1E16	
	Volume Resistivity			ASTM D 257	ohm cm				
	Volume Resistivity			IEC 60093	ohm m	1E14		1E14	
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property			Method	Units	ZENITE 6130LX BK010	ZENITE 6130LX WT010	ZENITE 6140L BK010	ZENITE 6140L WT010
Electrical	Dielectric Strength, Step by Step	0.8mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Dielectric Strength, Step by Step	1.6mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Dielectric Strength, Step by Step	3.2mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Electric Strength	1.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil	34 870		45 1140	
	Electric Strength	2.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil	25 630		27 690	
	Dielectric Constant	60 Hz, 3.2mm	23ºC, (73ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E6 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E6 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E09 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.5			
	Dielectric Constant	1E09 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF) 250ºC, (480ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.6			
	Dielectric Constant	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		4.2			
	Dielectric Constant	1E10 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.6			

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	Property			Method	Units	ZENITE 6130LX BK010	ZENITE 6130LX WT010	ZENITE 6140L BK010	ZENITE 6140L WT010
Electrical	Relative Permittivity	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250					
	Relative Permittivity	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		4.2			
			100ºC, (212ºF)			4.6			
			150ºC, (300ºF)			4.6			
			200ºC, (390ºF)			4.6			
	Relative Permittivity	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		4.0			
			100ºC, (212ºF)			4.3			
			150ºC, (300ºF)			4.4			
			200ºC, (390ºF)			4.4			
	Dissipation Factor	60 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
			200ºC, (390ºF)						
	Dissipation Factor	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E3 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E3 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E6 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E6 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E09 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E09 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.006			
	Dissipation Factor	1E09 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
			250ºC, (480ºF)						
	Dissipation Factor	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor		23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.006			
	Dissipation Factor	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		0.006			
	Dissipation Factor	1E10 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.007			
	Dissipation Factor	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4				
	Dissipation Factor	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	170			
			100ºC, (212ºF)			120			
			150ºC, (300ºF)			110			
			200ºC, (390ºF)			170			
	Dissipation Factor	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	310			
			100ºC, (212ºF)			360			
			150ºC, (300ºF)			150			
			200ºC, (390ºF)			50			
	CTI			IEC 60112	V	200		175	
	CTI			UL 746A	V	175-249	175-249	175-249	175-249

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property		Method	Units	ZENITE 6130LX BK010	ZENITE 6130LX WT010	ZENITE 6140L BK010	ZENITE 6140L WT010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.75	1.5	0.4	1.5
	Flammability Classification		UL94		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.75	1.5	0.4	1.5
	Oxygen Index		ASTM D 2863	%				
	Oxygen Index		ISO 4589-1/-2	%				
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C	960			
		1.5mm			960	960		
		3.0mm			960	960		
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C	960			
		1.5mm			960	960		
		3.0mm			960	960		
	High Amperage Arc Ignition Resistance	0.3mm	UL 746A	arcs				
		0.75mm						
		1.5mm						
		3.0mm						
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C	240		240	
		0.8mm						
		1.5mm			240	240	240	240
	RTI, Impact	0.75mm	UL 746B	C	220		220	
		0.8mm						
		1.5mm			220	220	220	220
	RTI, Strength	0.75mm	UL 746B	C	240		240	
		0.8mm						
		1.5mm			240	240	240	240
Other	Density		ISO 1183	kg/m3	1660	1660	1710	1770
				g/cm3	1.66	1.66	1.71	1.77
	Hardness, Rockwell	Scale M	ASTM D 785					
		Scale R						
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg				
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%				
		Immersion, 10000h						
		Immersion, 24h						
	UL Regrind Approval		UL 746D	%	50	50		
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%	0.12		0.05	0.05
		Normal, 2.0mm			0.6		0.5	0.5
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%				
		Transverse, 0.8mm						
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%				
		Transverse, 1.6mm						
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%				
		Transverse, 3.2mm						
Processing	Melt Temperature Range			C	350-360	350-360	350-360	350-360
				F	660-680	660-680	660-680	660-680
	Melt Temperature Optimum			C	355	355	355	355
				F	670	670	670	670
	Mold Temperature Range			C	40-150	40-150	40-150	40-150
				F	105-300	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80	80
				F	175	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3	3
	Drying Temperature			C	150	150	150	150
				F	304	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01	<0.01

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	Property			Method	Units	ZENITE 6330 BK010	ZENITE 6330 NC010	ZENITE 6635 BK010
	Resin Identification			ISO 1043		LCP-MD30	LCP-MD30	LCP-(MD+GF)40
	Part Marking Code			ISO 11469		>LCP-MD30<	>LCP-MD30<	>LCP-(MD+GF)40<
Mechanical	Stress at Break			ISO 527	MPa	125	130	100
					kpsi	18.1	18.9	14.5
	Strain at Break			ISO 527	%	4.2	5	3.2
	Tensile Modulus			ISO 527	MPa	9200	10000	9000
					kpsi	1330	9200	1310
	Shear Strength		0.8mm	ASTM D 732	MPa			
			0.031in		kpsi			
			3.2mm		MPa			
			0.125in		kpsi			
	Flexural Modulus			ISO 178	MPa	8000	7100	7200
					kpsi	1160	1030	1040
	Flexural Strength			ISO 178	MPa	145	145	140
					kpsi	21.0	21.0	20.3
	Compressive Strength			ASTM D 695	MPa			
					kpsi			
	Compressive Modulus			ASTM D 695	MPa	4100	4100	
					kpsi	590	590	
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%			
	Izod Impact		23ºC	ASTM D 256	J/m	160	160	
			73ºF		ft lb/in	3.0	3.0	
	Unnotched Impact		-40ºC	ASTM D 4812	J/m			
			-40ºF		ft lb/in			
			23ºC		J/m			
			73ºF		ft lb/in			
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2	7		
			23ºC, (73ºF)			9	9	7
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2	40		
			23ºC, (73ºF)			60		
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C	245	245	240
					F	473	470	464
	Deflection Temperature		1.80MPa		C			
				ISO 75-1/-2 1993/N2	F			
	Melting Temperature		10°C/min	ISO 11357-1/-3	C	335	335	335
					F	635	635	635
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.05		
			23-160°C (73-320°F), 4mm			0.10		
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	-0.04		
			160-260°C (320-500°F), 4mm			0.10		
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.43		
			23-160°C (73-320°F), 4mm			0.48		
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	0.46		
			160-260°C (320-500°F), 4mm			0.62		
	Glass Transition Temperature		10°C/min	ISO 11357-1/-2	C	120	120	
					F	250	250	
	Extrapolated End Melt Temp.			ASTM D 3418	C	350	350	
					F	662	662	
	Thermal Conductivity			ASTM C 177	W/mºK			
					Btu in/h ft2ºF			
Electrical	Surface Resistivity			ASTM D 257	ohm	>1E16	>1E16	
	Surface Resistivity			IEC 60093	ohm	1E16		
	Volume Resistivity			ASTM D 257	ohm cm	>1E16	>1E16	
	Volume Resistivity			IEC 60093	ohm m	1E14		
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm	49	49	
			73ºF		V/mil	1240	1240	
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm	41	41	
			73ºF		V/mil	1040	1040	
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm	26	26	
			73ºF		V/mil	660	660	
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property			Method	Units	ZENITE 6330 BK010	ZENITE 6330 NC010	ZENITE 6635 BK010
Electrical	Dielectric Strength, Step by Step	0.8mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil	40 1020	40 1020	
	Dielectric Strength, Step by Step	1.6mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil	29 740	29 740	
	Dielectric Strength, Step by Step	3.2mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil	21 530	21 530	
	Electric Strength	1.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil	35 900		
	Electric Strength	2.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil	26 660		
	Dielectric Constant	60 Hz, 3.2mm	23ºC, (73ºF) 200ºC, (390ºF)	ASTM D 150				
	Dielectric Constant	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		3.3	3.3	
	Dielectric Constant	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.6	3.6	
	Dielectric Constant	1E3 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		3.3	3.3	
	Dielectric Constant	1E3 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		3.6	3.6	
	Dielectric Constant	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				
	Dielectric Constant	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				
	Dielectric Constant	1E6 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		2.9	2.9	
	Dielectric Constant	1E6 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		3.2	3.2	
	Dielectric Constant	1E09 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		3.9 4.0 4.0 4.2	3.9 4.0 4.0 4.2	
	Dielectric Constant	1E09 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		3.9 4.0 4.0 4.1	3.9 4.0 4.0 4.1	
	Dielectric Constant	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dielectric Constant	1E09 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF) 250ºC, (480ºF)	ASTM D 2520 B		3.9 4.0 4.0 4.1 4.2	3.9 4.0 4.0 4.1 4.2	
	Dielectric Constant	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dielectric Constant	1E10 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		4.1 4.1 4.1 4.1	4.1 4.1 4.1 4.1	
	Dielectric Constant	1E10 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		4.0 4.0 4.0 4.0	4.0 4.0 4.0 4.0	
	Dielectric Constant	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dielectric Constant	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B				
	Dielectric Constant	1E10 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		4.1 4.1 4.1 4.1	4.1 4.1 4.1 4.1	
	Dielectric Constant	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dielectric Constant	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				

Test temperatures are 23°C (73°F) unless otherwise stated.

	Property			Method	Units	ZENITE 6330 BK010	ZENITE 6330 NC010	ZENITE 6635 BK010
Electrical	Relative Permittivity	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		3.8		
	Relative Permittivity	1E3 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250				
	Relative Permittivity	1E6 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250		3.4		
	Dissipation Factor	60 Hz, 3.2mm	23ºC, (73ºF) 200ºC, (390ºF)	ASTM D 150				
	Dissipation Factor	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		0.009	0.009	
	Dissipation Factor	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.008	0.008	
	Dissipation Factor	1E3 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		0.013	0.013	
	Dissipation Factor	1E3 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		0.013	0.013	
	Dissipation Factor	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				
	Dissipation Factor	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				
	Dissipation Factor	1E6 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		0.029	0.029	
	Dissipation Factor	1E6 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150		0.028	0.028	
	Dissipation Factor	1E09 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		0.002 0.012 0.018 0.027	0.002 0.012 0.018 0.027	
	Dissipation Factor	1E09 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		0.002 0.014	0.002 0.014	
	Dissipation Factor	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor	1E09 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF) 250ºC, (480ºF)	ASTM D 2520 B		0.002 0.014 0.020 0.029 0.026	0.002 0.014 0.020 0.029 0.026	
	Dissipation Factor	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor		23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		0.001 0.005 0.009 0.017	0.001 0.005 0.009 0.017	
	Dissipation Factor	1E10 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		0.001 0.006 0.009 0.018	0.001 0.006 0.009 0.018	
	Dissipation Factor	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor	1E10 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B		0.001 0.006 0.009 0.015	0.001 0.006 0.009 0.015	
	Dissipation Factor	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B				
	Dissipation Factor	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	140		
	Dissipation Factor	1E3 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250	E-4			
	Dissipation Factor	1E6 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250	E-4	310		
	CTI			IEC 60112	V	200		
	CTI			UL 746A	V	175-249	175-249	

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	Property		Method	Units	ZENITE 6330 BK010	ZENITE 6330 NC010	ZENITE 6635 BK010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0
	Min. Thickness Tested			mm	1.5	1.5	1.5
	Flammability Classification		UL94		V-0	V-0	V-0
	Min. Thickness Tested			mm	1.5	1.5	1.5
	Oxygen Index		ASTM D 2863	%			
	Oxygen Index		ISO 4589-1/-2	%	47		
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C			
		1.5mm					
		3.0mm					
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C			
		1.5mm					
		3.0mm					
	High Amperage Arc Ignition	0.3mm	UL 746A	arcs			
	Resistance	0.75mm					
		1.5mm			>119	>119	
		3.0mm			>119	>119	
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C			
		0.8mm					
		1.5mm			240	240	130
	RTI, Impact	0.75mm	UL 746B	C			
		0.8mm					
		1.5mm			220	220	130
	RTI, Strength	0.75mm	UL 746B	C			
		0.8mm					
		1.5mm			240	240	130
Other	Density		ISO 1183	kg/m3	1640	1640	1740
				g/cm3	1.64	1.64	1.74
	Hardness, Rockwell	Scale M	ASTM D 785				
		Scale R					
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg			
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%			
		Immersion, 10000h					
		Immersion, 24h					
	UL Regrind Approval		UL 746D	%			50
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%	0.0		
		Normal, 2.0mm			0.4		
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%			
		Transverse, 0.8mm					
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%			
		Transverse, 1.6mm					
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%	0	0	
		Transverse, 3.2mm			0.5	0.5	
Processing	Melt Temperature Range			C	350-360	350-360	350-360
				F	660-680	660-680	660-680
	Melt Temperature Optimum			C	355	355	355
				F	670	670	670
	Mold Temperature Range			C	40-150	40-150	40-150
				F	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80
				F	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3
	Drying Temperature			C	150	150	150
				F	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01

RTI values of 130°C are assigned by UL based on resin family, not as a result of a testing program.

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property			Method	Units	ZENITE 7130 BK010	ZENITE 7130 WT010	ZENITE 7145L BK010	ZENITE 7145L WT010
	Resin Identification			ISO 1043		LCP-GF30	LCP-GF30	LCP-GF45	LCP-GF45
	Part Marking Code			ISO 11469		>LCP-GF30<	>LCP-GF30<	>LCP-GF45<	>LCP-GF45<
Mechanical	Stress at Break			ISO 527	MPa	150	150	120	120
					kpsi	22.0	22.0	17.4	17.4
	Strain at Break			ISO 527	%	1.5	1.4	0.9	0.9
	Tensile Modulus			ISO 527	MPa	17000	16500	18000	18000
					kpsi	2470	2390	2610	2610
	Shear Strength		0.8mm	ASTM D 732	MPa	57	57		
			0.031in		kpsi	8.2	8.2		
			3.2mm		MPa	58	58		
			0.125in		kpsi	8.4	8.4		
	Flexural Modulus			ISO 178	MPa	13000	13000	17800	17800
					kpsi	1890	1890	2580	2580
	Flexural Strength			ISO 178	MPa	210	210	180	
					kpsi	30.5	30.5	26.1	
	Compressive Strength			ASTM D 695	MPa	89	89		
					kpsi	12.5	12.5		
	Compressive Modulus			ASTM D 695	MPa	5300	5300		
					kpsi	770	770		
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%				
	Izod Impact		23ºC	ASTM D 256	J/m	225	225	60	60
			73ºF		ft lb/in	4.2	4.2	1.1	1.1
	Unnotched Impact		-40ºC	ASTM D 4812	J/m	555	555		
			-40ºF		ft lb/in	10.4	10.4		
			23ºC		J/m	740	740	316	316
			73ºF		ft lb/in	13.9	13.9	5.9	5.9
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2	20	20	10	8
			23ºC, (73ºF)			20	20	10	8
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2	22	22	13	12
			23ºC, (73ºF)			30	30	18	14
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C			295	295
					F			563	563
	Deflection Temperature		1.80MPa	ISO 75-1/-2	C	310	310		
				1993/N2	F	590	590		
	Melting Temperature		10˚C/min	ISO 11357-1/-3	C	352	352	352	352
					F	666	666	666	666
	CLTE, Parallel		23-160˚C (73-320˚F), 2mm	ISO 11359-1/-2	E-4/C	0	0	0.03	0.03
			23-160˚C (73-320˚F), 4mm			0.02	0.02	0.05	0.05
	CLTE, Parallel		160-260˚C (320-500˚F), 2mm	ISO 11359-1/-2	E-4/C	-0.04	-0.04	0	0
			160-260˚C (320-500˚F), 4mm			-0.04	-0.04	0.03	0.03
	CLTE, Normal		23-160˚C (73-320˚F), 2mm	ISO 11359-1/-2	E-4/C	0.82	0.82	0.72	0.72
			23-160˚C (73-320˚F), 4mm			0.76	0.76	0.72	0.72
	CLTE, Normal		160-260˚C (320-500˚F), 2mm	ISO 11359-1/-2	E-4/C	1.02	1.02	0.86	0.86
			160-260˚C (320-500˚F), 4mm			0.94	0.94	0.85	0.85
	Glass Transition Temperature		10˚C/min	ISO 11357-1/-2	C	120	120	120	120
					F	250	250	250	250
	Extrapolated End Melt Temp.			ASTM D 3418	C	360	360		
					F	680	680		
	Thermal Conductivity			ASTM C 177	W/mºK	0.32	0.32	0.32	0.32
					Btu in/h ft2ºF	2.2	2.2	2.2	2.2
Electrical	Surface Resistivity			ASTM D 257	ohm	1E15	1E15		
	Surface Resistivity			IEC 60093	ohm	1E16		1E16	
	Volume Resistivity			ASTM D 257	ohm cm	1E16	1E16		
	Volume Resistivity			IEC 60093	ohm m	1E14		1E14	
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm			34	34
			73ºF		V/mil			870	870
			120ºC		kV/mm			33	33
			250ºF		V/mil			840	840
			150ºC		kV/mm			33	33
			300ºF		V/mil			840	840
			200ºC		kV/mm			32	32
			390ºF		V/mil			810	810
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm	35	35	27	27
			73ºF		V/mil	900	900	690	690
			120ºC		kV/mm	34	34		
			250ºF		V/mil	870	870		
			150ºC		kV/mm	36	36	25	25
			300ºF		V/mil	920	920	630	630
			200ºC		kV/mm	35	35	26	26
			390ºF		V/mil	900	900	660	660
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm			21	21
			73ºF		V/mil			530	530
			120ºC		kV/mm			20	20
			250ºF		V/mil			500	500
			150ºC		kV/mm			20	20
			300ºF		V/mil			500	500
			200ºC		kV/mm			20	20
			390ºF		V/mil			500	500

Test temperatures are 23°C (73°F) unless otherwise stated.

	Property			Method	Units	ZENITE 7130 BK010	ZENITE 7130 WT010	ZENITE 7145L BK010	ZENITE 7145L WT010
Electrical	Dielectric Strength, Step by Step	0.8mm	23ºC	ASTM D 149	kV/mm			25	25
			73ºF		V/mil			630	630
	Dielectric Strength, Step by Step	1.6mm	23ºC	ASTM D 149	kV/mm	31	31	24	24
			73ºF		V/mil	790	790	600	600
	Dielectric Strength, Step by Step	3.2mm	23ºC	ASTM D 149	kV/mm	24	24	19	19
			73ºF		V/mil	600	600	475	475
	Electric Strength	1.0mm	23ºC	IEC 60243-1	kV/mm	45		36	
			73ºF		V/mil	1140		920	
			100ºC		kV/mm				
			212ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Electric Strength	2.0mm	23ºC	IEC 60243-1	kV/mm	27		29	
			73ºF		V/mil	690		740	
			100ºC		kV/mm				
			212ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Constant	60 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				4.3	4.3
			200ºC, (390ºF)					5.6	5.6
	Dielectric Constant	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		3.9	3.9		
			120ºC, (250ºF)			4.4	4.4		
			150ºC, (300ºF)			4.5	4.5		
			200ºC, (390ºF)			4.4	4.4		
	Dielectric Constant	1E3 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		4.3	4.3	4.6	4.6
			120ºC, (250ºF)			4.9	4.9	5.3	5.3
			150ºC, (300ºF)			5.0	5.0	5.4	5.4
			200ºC, (390ºF)			5.0	5.0	5.5	5.5
	Dielectric Constant	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E6 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		3.5	3.5		
			120ºC, (250ºF)			4.3	4.3		
			150ºC, (300ºF)			4.4	4.4		
			200ºC, (390ºF)			4.4	4.4		
	Dielectric Constant	1E6 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		3.8	3.8	4.3	4.3
			120ºC, (250ºF)			4.5	4.5	5.2	5.2
			150ºC, (300ºF)			4.8	4.8	5.3	5.3
			200ºC, (390ºF)			4.9	4.9	5.3	5.3
	Dielectric Constant	1E09 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B		4.4	4.4		
			120ºC, (250ºF)			4.4	4.4		
			150ºC, (300ºF)			4.4	4.4		
			200ºC, (390ºF)			4.8	4.8		
	Dielectric Constant	1E09 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B		4.3	4.3		
			120ºC, (250ºF)			4.4	4.4		
			150ºC, (300ºF)			4.4	4.4		
			200ºC, (390ºF)			4.7	4.7		
	Dielectric Constant	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.2			
	Dielectric Constant	1E09 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B		4.3	4.3		
			120ºC, (250ºF)			4.4	4.4		
			150ºC, (300ºF)			4.4	4.4		
			200ºC, (390ºF)			4.7	4.7		
			250ºC, (480ºF)						
	Dielectric Constant	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.4			
	Dielectric Constant	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		3.9			
	Dielectric Constant	1E10 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dielectric Constant	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.3			

Test temperatures are 23°C (73°F) unless otherwise stated.

	Property			Method	Units	ZENITE 7130 BK010	ZENITE 7130 WT010	ZENITE 7145L BK010	ZENITE 7145L WT010
Electrical	Relative Permittivity	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		4.1		4.8	
	Relative Permittivity	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		4.0			
			100ºC, (212ºF)			4.4			
			150ºC, (300ºF)			4.4			
			200ºC, (390ºF)			4.4			
	Relative Permittivity	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250		3.7		4.4	
			100ºC, (212ºF)			4.1			
			150ºC, (300ºF)			4.3			
			200ºC, (390ºF)			4.3			
	Dissipation Factor	60 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150				0.014	0.014
			200ºC, (390ºF)					0.083	0.083
	Dissipation Factor	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E3 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		0.013	0.013		
			120ºC, (250ºF)			0.007	0.007		
			150ºC, (300ºF)			0.007	0.007		
			200ºC, (390ºF)			0.012	0.012		
	Dissipation Factor	1E3 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.013	0.013	0.013	0.013
			120ºC, (250ºF)			0.006	0.006	0.008	0.008
			150ºC, (300ºF)			0.006	0.006	0.009	0.009
			200ºC, (390ºF)			0.012	0.012	0.015	0.015
	Dissipation Factor	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E6 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150		0.029	0.029		
			120ºC, (250ºF)			0.030	0.030		
			150ºC, (300ºF)			0.015	0.015		
			200ºC, (390ºF)			0.009	0.009		
	Dissipation Factor	1E6 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150		0.029	0.029	0.025	0.025
			120ºC, (250ºF)			0.034	0.034	0.023	0.023
			150ºC, (300ºF)			0.014	0.014	0.012	0.012
			200ºC, (390ºF)			0.009	0.009	0.008	0.008
	Dissipation Factor	1E09 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 2520 B		0.004	0.004		
			120ºC, (250ºF)			0.013	0.013		
			150ºC, (300ºF)			0.019	0.019		
			200ºC, (390ºF)			0.026	0.026		
	Dissipation Factor	1E09 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B		0.004	0.004		
			120ºC, (250ºF)			0.014	0.014		
			150ºC, (300ºF)			0.020	0.020		
			200ºC, (390ºF)			0.028	0.028		
	Dissipation Factor	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.005			
	Dissipation Factor	1E09 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B		0.004	0.004		
			120ºC, (250ºF)			0.016	0.016		
			150ºC, (300ºF)			0.022	0.022		
			200ºC, (390ºF)			0.030	0.030		
			250ºC, (480ºF)			0.033			
	Dissipation Factor	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor		23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 1.6mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.005			
	Dissipation Factor	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		0.005			
	Dissipation Factor	1E10 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 2520 B					
			120ºC, (250ºF)						
			150ºC, (300ºF)						
			200ºC, (390ºF)						
	Dissipation Factor	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.006			
	Dissipation Factor	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	140		130	
	Dissipation Factor	1E3 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	150			
			100ºC, (212ºF)			100			
			150ºC, (300ºF)			100			
			200ºC, (390ºF)			130			
	Dissipation Factor	1E6 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4	300		240	
			100ºC, (212ºF)			450			
			150ºC, (300ºF)			180			
			200ºC, (390ºF)			100			
	CTI			IEC 60112	V	175	200	175	
	CTI			UL 746A	V	100-174	100-174	175-249	175-249

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property		Method	Units	ZENITE 7130 BK010	ZENITE 7130 WT010	ZENITE 7145L BK010	ZENITE 7145L WT010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.4	0.4	0.75	1.5
	Flammability Classification		UL94		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.4	0.4	0.75	1.5
	Oxygen Index		ASTM D 2863	%	39	39	38.5	38.5
	Oxygen Index		ISO 4589-1/-2	%	45		45	
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C				
		1.5mm						
		3.0mm						
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C				
		1.5mm						
		3.0mm						
	High Amperage Arc Ignition	0.3mm	UL 746A	arcs				
	Resistance	0.75mm					<15	
		1.5mm					<15	<15
		3.0mm					<15	<15
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C	240	240	240	
		0.8mm						
		1.5mm			240	240	240	240
	RTI, Impact	0.75mm	UL 746B	C	210	210	210	
		0.8mm						
		1.5mm			210	210	210	210
	RTI, Strength	0.75mm	UL 746B	C	240	240	240	
		0.8mm						
		1.5mm			240	240	240	240
Other	Density		ISO 1183	kg/m3	1620	1670	1740	1810
				g/cm3	1.62	1.67	1.74	1.81
	Hardness, Rockwell	Scale M	ASTM D 785		63	63		
		Scale R			110	110		
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg	63	63		
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%				
		Immersion, 10000h						
		Immersion, 24h					0.1	0.1
	UL Regrind Approval		UL 746D	%	50	50		
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%	0.01		0.05	0.05
		Normal, 2.0mm			0.6		0.5	0.5
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%				
		Transverse, 0.8mm						
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%	-0.1	-0.1	0.07	0.07
		Transverse, 1.6mm			0.9	0.9	0.5	0.5
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%	0	0	0.01	0.01
		Transverse, 3.2mm			0.8	0.8	0.3	0.3
Processing	Melt Temperature Range			C	360-370	360-370	360-370	360-370
				F	680-700	680-700	680-700	680-700
	Melt Temperature Optimum			C	365	365	365	365
				F	690	690	690	690
	Mold Temperature Range			C	40-150	40-150	40-150	40-150
				F	105-300	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80	80
				F	175	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3	3
	Drying Temperature			C	150	150	150	150
				F	304	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01	<0.01

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	Property			Method	Units	ZENITE 7244 BK010	ZENITE 7244 NC010	ZENITE 9140HT BK010	ZENITE 9140HT NC010
	Resin Identification			ISO 1043		LCP-(GF+MD)40	LCP-(GF+MD)40	LCP-GF40	LCP-GF40
	Part Marking Code			ISO 11469		>LCP-(GF+MD)40<	>LCP-(GF+MD)40<	>LCP-GF40<	>LCP-GF40<
Mechanical	Stress at Break			ISO 527	MPa	115	120	177	175
					kpsi	16.7	17.4	25.7	25.4
	Strain at Break			ISO 527	%	1.4	1.5	1.4	1.5
	Tensile Modulus			ISO 527	MPa	14000	14000	17000	18000
					kpsi	2030	2030	2470	2610
	Shear Strength		0.8mm	ASTM D 732	MPa				
			0.031in		kpsi				
			3.2mm		MPa				
			0.125in		kpsi				
	Flexural Modulus			ISO 178	MPa	11300	11300	16000	16000
					kpsi	1640	1640	2320	2320
	Flexural Strength			ISO 178	MPa	180	190	250	250
					kpsi	26.1	27.6	36.2	36.2
	Compressive Strength			ASTM D 695	MPa				
					kpsi				
	Compressive Modulus			ASTM D 695	MPa				
					kpsi				
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%				
	Izod Impact		23ºC	ASTM D 256	J/m				
			73ºF		ft lb/in				
	Unnotched Impact		-40ºC	ASTM D 4812	J/m				
			-40ºF		ft lb/in				
			23ºC		J/m				
			73ºF		ft lb/in				
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2				
			23ºC, (73ºF)			9	13	15	15
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2				
			23ºC, (73ºF)						
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C				
					F				
	Deflection Temperature		1.80MPa		C	295	295	356	356
				ISO 75-1/-2 1993/N2	F	563	563	673	673
	Melting Temperature		10°C/min	ISO 11357-1/-3	C				
					F				
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.06			
			23-160°C (73-320°F), 4mm			0.07			
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	0.03			
			160-260°C (320-500°F), 4mm			0.04			
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C	0.43			
			23-160°C (73-320°F), 4mm			0.47			
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C	0.48			
			160-260°C (320-500°F), 4mm			0.55			
	Glass Transition Temperature		10°C/min	ISO 11357-1/-2	C				
					F				
	Extrapolated End Melt Temp.			ASTM D 3418	C				
					F				
	Thermal Conductivity			ASTM C 177	W/mºK				
					Btu in/h ft2ºF				
Electrical	Surface Resistivity			ASTM D 257	ohm				
	Surface Resistivity			IEC 60093	ohm				
	Volume Resistivity			ASTM D 257	ohm cm				
	Volume Resistivity			IEC 60093	ohm m				
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				

Test temperatures are 23°C (73°F) unless otherwise stated.

	Property			Method	Units	ZENITE 7244 BK010	ZENITE 7244 NC010	ZENITE 9140HT BK010	ZENITE 9140HT NC010
Electrical	Dielectric Strength, Step by Step	0.8mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Dielectric Strength, Step by Step	1.6mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Dielectric Strength, Step by Step	3.2mm	23ºC 73ºF	ASTM D 149	kV/mm V/mil				
	Electric Strength	1.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil				
	Electric Strength	2.0mm	23ºC 73ºF 100ºC 212ºF 150ºC 300ºF 200ºC 390ºF	IEC 60243-1	kV/mm V/mil kV/mm V/mil kV/mm V/mil kV/mm V/mil				
	Dielectric Constant	60 Hz, 3.2mm	23ºC, (73ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E3 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dielectric Constant	1E6 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E6 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dielectric Constant	1E09 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.1			
	Dielectric Constant	1E09 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF) 250ºC, (480ºF)	ASTM D 2520 B					
	Dielectric Constant	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.2			
	Dielectric Constant	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		3.9			
	Dielectric Constant	1E10 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dielectric Constant	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dielectric Constant	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		4.2			

	Property			Method	Units	ZENITE 7244 BK010	ZENITE 7244 NC010	ZENITE 9140HT BK010	ZENITE 9140HT NC010
Electrical	Relative Permittivity	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250					
	Relative Permittivity	1E3 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250					
	Relative Permittivity	1E6 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250					
	Dissipation Factor	60 Hz, 3.2mm	23ºC, (73ºF) 200ºC, (390ºF)	ASTM D 150					
	Dissipation Factor	1E2 Hz, 0.8mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E2 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E3 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dissipation Factor	1E3 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dissipation Factor	1E4 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E5 Hz, 3.2mm	23ºC, (73ºF)	ASTM D 150					
	Dissipation Factor	1E6 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dissipation Factor	1E6 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 150					
	Dissipation Factor	1E09 Hz, 0.8mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dissipation Factor	1E09 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dissipation Factor	1E09 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.004			
	Dissipation Factor	1E09 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF) 250ºC, (480ºF)	ASTM D 2520 B					
	Dissipation Factor	1E09 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor		23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dissipation Factor	1E10 Hz, 1.6mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dissipation Factor	1E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.004			
	Dissipation Factor	1E10 Hz, 2.0mm, Transverse	23ºC, (73ºF)	ASTM D 2520 B		0.004			
	Dissipation Factor	1E10 Hz, 3.2mm	23ºC, (73ºF) 120ºC, (250ºF) 150ºC, (300ºF) 200ºC, (390ºF)	ASTM D 2520 B					
	Dissipation Factor	1E10 Hz, 4.0mm	23ºC, (73ºF)	ASTM D 2520 B					
	Dissipation Factor	2E10 Hz, 2.0mm	23ºC, (73ºF)	ASTM D 2520 B		0.004			
	Dissipation Factor	1E2 Hz, 2.0mm	23ºC, (73ºF)	IEC 60250	E-4				
	Dissipation Factor	1E3 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250	E-4				
	Dissipation Factor	1E6 Hz, 2.0mm	23ºC, (73ºF) 100ºC, (212ºF) 150ºC, (300ºF) 200ºC, (390ºF)	IEC 60250	E-4				
	CTI			IEC 60112	V				
	CTI			UL 746A	V				

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	Property		Method	Units	ZENITE 7244 BK010	ZENITE 7244 NC010	ZENITE 9140HT BK010	ZENITE 9140HT NC010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.35	0.35	0.3	0.75
	Flammability Classification		UL94		V-0	V-0	V-0	V-0
	Min. Thickness Tested			mm	0.35	0.35	0.3	0.75
	Oxygen Index		ASTM D 2863	%				
	Oxygen Index		ISO 4589-1/-2	%				
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C				
		1.5mm						
		3.0mm						
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C				
		1.5mm						
		3.0mm						
	High Amperage Arc Ignition	0.3mm	UL 746A	arcs			>120	
	Resistance	0.75mm					>120	>120
		1.5mm						
		3.0mm						
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C	130	130	130	130
		0.8mm						
		1.5mm						
	RTI, Impact	0.75mm	UL 746B	C	130	130	130	130
		0.8mm						
		1.5mm						
	RTI, Strength	0.75mm	UL 746B	C	130	130	130	130
		0.8mm						
		1.5mm						
Other	Density		ISO 1183	kg/m3	1730	1710	1720	1690
				g/cm3	1.73	17.1	1.72	1.69
	Hardness, Rockwell	Scale M	ASTM D 785					
		Scale R						
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg				
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%				
		Immersion, 10000h						
		Immersion, 24h						
	UL Regrind Approval		UL 746D	%				
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%	0.1			
		Normal, 2.0mm			0.5			
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%				
		Transverse, 0.8mm						
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%				
		Transverse, 1.6mm						
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%				
		Transverse, 3.2mm						
Processing	Melt Temperature Range			C	360-370	360-370	375-385	375-385
				F	680-700	680-700	710-725	710-725
	Melt Temperature Optimum			C	365	365	380	380
				F	690	690	715	715
	Mold Temperature Range			C	40-150	40-150	40-150	40-150
				F	105-300	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80	80
				F	175	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3	3
	Drying Temperature			C	150	150	150	150
				F	304	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01	<0.01

RTI values of 130°C are assigned by UL based on resin family, not as a result of a testing program.

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property			Method	Units	ZENITE FG6330 NC011	ZENITE FG7145L BK011	ZENITE ZE16130A BK010	ZENITE ZE16130A WT010
	Resin Identification			ISO 1043		LCP-MD30	LCP-GF45	LCP-GF30	LCP-GF30
	Part Marking Code			ISO 11469		>LCP-MD30<	>LCP-GF45<	>LCP-GF30<	>LCP-GF30<
Mechanical	Stress at Break			ISO 527	MPa	130	120	135	128
					kpsi	18.9	17.4	19.6	18.6
	Strain at Break			ISO 527	%	5	0.9	2	2
	Tensile Modulus			ISO 527	MPa	10000	18000	13000	13000
					kpsi	9200	2610	1890	1890
	Shear Strength		0.8mm	ASTM D 732	MPa				
			0.031in		kpsi				
			3.2mm		MPa				
			0.125in		kpsi				
	Flexural Modulus			ISO 178	MPa	7100	17500	10200	9800
					kpsi	1030	2550	1480	1420
	Flexural Strength			ISO 178	MPa	145	180	200	190
					kpsi	21.0	26.1	29.0	27.6
	Compressive Strength			ASTM D 695	MPa				
					kpsi				
	Compressive Modulus			ASTM D 695	MPa				
					kpsi				
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%				
	Izod Impact		23ºC	ASTM D 256	J/m				
			73ºF		ft lb/in				
	Unnotched Impact		-40ºC	ASTM D 4812	J/m				
			-40ºF		ft lb/in				
			23ºC		J/m				
			73ºF		ft lb/in				
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2		10		
			23ºC, (73ºF)			9	10	30	30
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2		13		
			23ºC, (73ºF)				18		
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C	245	295	275	275
					F	470	563	527	527
	Deflection Temperature		1.80MPa		C				
				ISO 75-1/-2 1993/N2	F				
	Melting Temperature		10°C/min	ISO 11357-1/-3	C	335	352	335	335
					F	635	666	635	635
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C				
			23-160°C (73-320°F), 4mm						
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C				
			160-260°C (320-500°F), 4mm						
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C				
			23-160°C (73-320°F), 4mm						
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C				
			160-260°C (320-500°F), 4mm						
	Glass Transition Temperature		10°C/min	ISO 11357-1/-2	C				
					F				
	Extrapolated End Melt Temp.			ASTM D 3418	C				
					F				
	Thermal Conductivity			ASTM C 177	W/mºK				
					Btu in/h ft2ºF				
Electrical	Surface Resistivity			ASTM D 257	ohm				
	Surface Resistivity			IEC 60093	ohm				
	Volume Resistivity			ASTM D 257	ohm cm				
	Volume Resistivity			IEC 60093	ohm m				
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm				
			73ºF		V/mil				
			120ºC		kV/mm				
			250ºF		V/mil				
			150ºC		kV/mm				
			300ºF		V/mil				
			200ºC		kV/mm				
			390ºF		V/mil				

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property		Method	Units	ZENITE FG6330 NC011	ZENITE FG7145L BK011	ZENITE ZE16130A BK010	ZENITE ZE16130A WT010
Flammability	Flammability Classification		IEC 60695-11-10				V-0	
	Min. Thickness Tested			mm			1.5	
	Flammability Classification		UL94				V-0	
	Min. Thickness Tested			mm			1.5	
	Oxygen Index		ASTM D 2863	%				
	Oxygen Index		ISO 4589-1/-2	%				
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C				
		1.5mm						
		3.0mm						
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C				
		1.5mm						
		3.0mm						
	High Amperage Arc Ignition Resistance	0.3mm	UL 746A	arcs				
		0.75mm						
		1.5mm						
		3.0mm						
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C				
		0.8mm						
		1.5mm					130	
	RTI, Impact	0.75mm	UL 746B	C				
		0.8mm						
		1.5mm					130	
	RTI, Strength	0.75mm	UL 746B	C				
		0.8mm						
		1.5mm					130	
Other	Density		ISO 1183	kg/m3	1640	1740	1580	1600
				g/cm3	1.64	1.74	1.58	1.60
	Hardness, Rockwell	Scale M	ASTM D 785					
		Scale R						
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg				
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%				
		Immersion, 10000h						
		Immersion, 24h						
	UL Regrind Approval		UL 746D	%				
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%		0.05		
		Normal, 2.0mm				0.5		
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%				
		Transverse, 0.8mm						
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%				
		Transverse, 1.6mm						
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%				
		Transverse, 3.2mm						
Processing	Melt Temperature Range			C	350-360	360-370	350-360	350-360
				F	660-680	680-700	660-680	660-680
	Melt Temperature Optimum			C	355	365	355	355
				F	670	690	670	670
	Mold Temperature Range			C	40-150	40-150	40-150	40-150
				F	105-300	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80	80
				F	175	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3	3
	Drying Temperature			C	150	150	150	150
				F	304	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01	<0.01

RTI values of 130°C are assigned by UL based on resin family, not as a result of a testing program.

Test temperatures are 23°C (73°F) unless otherwise stated.

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	Property			Method	Units	ZENITE ZE16401 BK010	ZENITE ZE55201 BK010	ZENITE ZE55801 NC010
	Resin Identification			ISO 1043		LCP-(MD30+S)	LCP-(GF+MD)50	LCP-GF30
	Part Marking Code			ISO 11469		>LCP-(MD30+S)<	>LCP-(GF+MD)50<	>LCP-GF30<
Mechanical	Stress at Break			ISO 527	MPa	120	88	140 *
					kpsi	17.4	12.8	20.3 *
	Strain at Break			ISO 527	%	3.8	1.4	4.0 *
	Tensile Modulus			ISO 527	MPa	8500	15800	
					kpsi	1230	2290	
	Shear Strength		0.8mm	ASTM D 732	MPa			
			0.031in		kpsi			
			3.2mm		MPa			
			0.125in		kpsi			
	Flexural Modulus			ISO 178	MPa	6600	12500	11000 *
					kpsi	960	1810	1600 *
	Flexural Strength			ISO 178	MPa	135	165	150 *
					kpsi	19.6	23.9	21.8 *
	Compressive Strength			ASTM D 695	MPa			
					kpsi			
	Compressive Modulus			ASTM D 695	MPa			
					kpsi			
	Deformation Under Load		27.6MPa (4000psi)	ASTM D 621	%			
	Izod Impact		23ºC	ASTM D 256	J/m			345
			73ºF		ft lb/in			6.5
	Unnotched Impact		-40ºC	ASTM D 4812	J/m			
			-40ºF		ft lb/in			
			23ºC		J/m			
			73ºF		ft lb/in			858
	Notched Charpy Impact		-30ºC, (-22ºCºF)	ISO 179/1eA	kJ/m2			16.1
			23ºC, (73ºF)			9	3.6	
	Unnotched Charpy Impact		-30ºC, (-22ºF)	ISO 179/1eU	kJ/m2			
			23ºC, (73ºF)					
Thermal	Deflection Temperature		1.80MPa	ISO 75-1/-2	C	245		
					F	473		
	Deflection Temperature		1.80MPa		C		290	
				ISO 75-1/-2 1993/N2	F		554	
	Melting Temperature		10˚C/min	ISO 11357-1/-3	C	335		
					F	635		
	CLTE, Parallel		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C			
			23-160°C (73-320°F), 4mm					
	CLTE, Parallel		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C			
			160-260°C (320-500°F), 4mm					
	CLTE, Normal		23-160°C (73-320°F), 2mm	ISO 11359-1/-2	E-4/C			
			23-160°C (73-320°F), 4mm					
	CLTE, Normal		160-260°C (320-500°F), 2mm	ISO 11359-1/-2	E-4/C			
			160-260°C (320-500°F), 4mm					
	Glass Transition Temperature		10˚C/min	ISO 11357-1/-2	C			
					F			
	Extrapolated End Melt Temp.			ASTM D 3418	C			
					F			
	Thermal Conductivity			ASTM C 177	W/mºK			
					Btu in/h ft2ºF			
Electrical	Surface Resistivity			ASTM D 257	ohm			
	Surface Resistivity			IEC 60093	ohm			
	Volume Resistivity			ASTM D 257	ohm cm			
	Volume Resistivity			IEC 60093	ohm m			
	Dielectric Strength, Short Time	0.8mm	23ºC	ASTM D 149	kV/mm			
			73ºF		V/mil			
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			
	Dielectric Strength, Short Time	1.6mm	23ºC	ASTM D 149	kV/mm			
			73ºF		V/mil			
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			
	Dielectric Strength, Short Time	3.2mm	23ºC	ASTM D 149	kV/mm			
			73ºF		V/mil			
			120ºC		kV/mm			
			250ºF		V/mil			
			150ºC		kV/mm			
			300ºF		V/mil			
			200ºC		kV/mm			
			390ºF		V/mil			

Test temperatures are 23°C (73°F) unless otherwise stated.

DuPont™ Zenite®
Product and Properties Guide

	Property		Method	Units	ZENITE ZE16401 BK010	ZENITE ZE55201 BK010	ZENITE ZE55801 NC010
Flammability	Flammability Classification		IEC 60695-11-10		V-0	V-0	V-0
	Min. Thickness Tested			mm	1.5	0.8	1.5
	Flammability Classification		UL94		V-0	V-0	V-0
	Min. Thickness Tested			mm	1.5	0.8	1.5
	Oxygen Index		ASTM D 2863	%			
	Oxygen Index		ISO 4589-1/-2	%			
	Glow Wire Flammability Index	0.75mm	IEC 60695-2-12	C			
		1.5mm					
		3.0mm					
	Glow Wire Ignition Temperature	0.75mm	IEC 60695-2-13	C			
		1.5mm					
		3.0mm					
	High Amperage Arc Ignition Resistance	0.3mm	UL 746A	arcs			
		0.75mm					
		1.5mm					
		3.0mm					
Temperature Index	RTI, Electrical	0.75mm	UL 746B	C			
		0.8mm				130	
		1.5mm			130		130
	RTI, Impact	0.75mm	UL 746B	C			
		0.8mm				130	
		1.5mm			130		130
	RTI, Strength	0.75mm	UL 746B	C			
		0.8mm				130	
		1.5mm			130		130
Other	Density		ISO 1183	kg/m3	1670	1850	1650
				g/cm3	1.67	1.85	1.65
	Hardness, Rockwell	Scale M	ASTM D 785				
		Scale R					
	Taber Abrasion	CS-17 Wheel, 1kg, 1000 cycles	ASTM D 1044	mg			
	Water Absorption	50%RH,23°C,24h	ASTM D 570	%			
		Immersion, 10000h					
		Immersion, 24h					
	UL Regrind Approval		UL 746D	%			
	Molding Shrinkage	Parallel, 2.0mm	ISO 294-4	%			
		Normal, 2.0mm					
	Mold Shrinkage	Flow, 0.8mm	ASTM D 955	%			
		Transverse, 0.8mm					
	Mold Shrinkage	Flow, 1.6mm	ASTM D 955	%			
		Transverse, 1.6mm					
	Mold Shrinkage	Flow, 3.2mm	ASTM D 955	%			
		Transverse, 3.2mm					
Processing	Melt Temperature Range			C	350-360	330-350	330-350
				F	660-680	625-660	625-660
	Melt Temperature Optimum			C	355	335	335
				F	670	635	635
	Mold Temperature Range			C	40-150	40-150	40-150
				F	105-300	105-300	105-300
	Mold Temperature Optimum			C	80	80	80
				F	175	175	175
	Drying Time, Dehumidified Dryer			h	3	3	3
	Drying Temperature			C	150	150	150
				F	304	304	304
	Processing Moisture Content			%	<0.01	<0.01	<0.01

RTI values of 130°C are assigned by UL based on resin family, not as a result of a testing program.

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