ProtoGen 18120

Unspecified

DSM Somos®

Message:

DSM's Somos® ProtoGen 18120 is a liquid, ABS-like photopolymer that produces accurate parts ideal for general purpose applications. Somos® ProtoGen resins are the first stereolithography resins to demonstrate different material properties based on machine exposure control. Based on Somos® Oxetane[™] chemistry, Somos® ProtoGen 18120 offers superior chemical resistance, a wide processing latitude and excellent tolerance to a broad range of temperature and humidity, both during and after the build.

Applications

This high-temperature resistant, ABS-like photopolymer is used in solid imaging processes, such as stereolithography, to built three-dimensional parts. Somos ® ProtoGen 18120 provides considerable processing latitude and is ideal for the medical, electronic, aerospace and automotive markets that demand accurate RTV patterns, durable concept models, highly accurate and humidity & temperature resistant parts.

General Information				
Features	Durable			
	Good Chemical Resistance			
	High Heat Resistance			
	Humidity Resistant			
Uses	Aerospace Applications			
	Automotive Applications			
	Electrical/Electronic Applications			
	General Purpose			
	Medical/Healthcare Applications			
	Modeling Material			
	Mold Making			
	Patterns			
Appearance	Translucent			
Forms	Liquid			
Processing Method	3D Printing, Stereolithogra	aphy		
Physical	Nominal Value	Unit	Test Method	
Density	1.16	g/cm³		
Water Absorption			ASTM D570	
Equilibrium ¹	0.75	%		
Equilibrium ²	0.77	%		
Viscosity (30°C)	300	mPa·s		
Poisson's Ratio			ASTM D638	
3	0.43 to 0.45			
4	0.43			
Critical Exposure	6.73	mJ/cm ²		
Penetration Depth	116.1	μm		

Shore D 597 to 88Shore D 694 to 95MechanicalNorminal ValueUnitTest MethodTensile ModulusS50 to 2520MPaSTM D638- ^7550 to 2520MPaSTM D638- ^8920 to 2740MPaSTM D638- ^9688 to 692MPaSTM D638- 10680 to 57.1MPaSTM D638- 10690 to 12MPaSTM D638- 10810 to 12MPaSTM D638- 10810 to 12MPaSTM D638- 10810 to 2400MPaSTM D790- 10230 to 2400MPaSTM D790- 10230 to 2400MPaSTM D790- 10230 to 2400MPaSTM D790- 10330 to 2400MPaSTM D790- 10330 to 2400MPaSTM D790- 10340 to 250MPaSTM D790- 10340 to 250MPaSTM D790- 10340 to 250MPaSTM D790- 10340 to 250MPaSTM D790- 11MPaMPaSTM D790- 12340 to 250MP	Hardness	Nominal Value	Unit	Test Method
Shore D *B4 to 85MechanicalNoninal ValueUnitText MethodTernalle Modulus230 to 2620MPa5570 to 2620- ^230 to 2620MPa5570 to 2620- ^230 to 2620MPa5570 to 2620- ^2620 to 2740MPa5570 to 2620- ^688 to 692.0MPa5570 to 2620- ^10688 to 692.0MPa5570 to 2620- 11517 to 5.9MPa5570 to 2620- 12517 to 5.9MPa5570 to 2620Break ¹³ 60 to 12%5570 to 2620Break ¹³ 80 to 12%5570 to 2620Preak ¹⁴ 70 to 8.0MPa5570 to 2620- 14320 to 2420MPa5570 to 2620- 15818 to 83.8MPa5570 to 2620- 14310 to 2400MPa5570 to 2620- 15310 to 2400MPa5570 to 2620- 14310 to 2400MPa5570 to 2620- 15310 to 2400MPa5570 to 2620- 16310 to 2500MPa5570 to 2620- 17318 to 83.8MPa5570 to 2620- 1818 to 83.8MPa5570 to 2620- 19Mainal ValueUnitText Method- 2413 to 25J/m5570 to 58.0- 2413 to 25J/m5570 to 58.0- 2413 to 25J/m5570 to 58.0- 2413 to 25J/m5570 to 58.0 <trr>- 2413 to 25<!--</td--><td>Durometer Hardness</td><td></td><td></td><td>ASTM D2240</td></trr>	Durometer Hardness			ASTM D2240
MechanicalNormal ValueUnitTensileTensile Modulus2540 to 2620MPa- ⁶ 2540 to 2620MPa- ⁶ 2620 to 2740MPa- ⁶ 2620 to 2740MPa- ¹⁰ 2620 to 2740MPa- ¹⁰ 66.8 to 69.2MPa- ¹⁰ 56.9 to 57.1MPa- ¹⁰ 56.9 to 57.1MPa- ¹⁰ 56.9 to 57.1MPa- ¹⁰ 66.8 to 69.2MPa- ¹⁰ 60.0 12%Break ¹³ 60.0 to 12%Break ¹⁴ 70 to 8.0%Preak ¹⁵ 8.0 to 12%Preak ¹⁵ 8.0 to 12%Preak ¹⁵ 8.0 to 12%Preak ¹⁵ 8.0 to 220%Preak ¹⁶ 2360 to 2400MPa- ¹⁰ 230 to 2400MPa- ¹⁰ 38.0 to 50.0MPa- ¹⁰ 118 to 83.8MPa- ²⁰ 8.18 to 83.7MPa- ²¹ 38.0 to 80.7MPa- ²² 114 to 26//ma- ²⁴ 13 to 25//ma- ²⁴ 14 to 26//ma- ²⁴ 14 to 26//ma- ¹⁴ Normal Value <td< td=""><td>Shore D⁵</td><td>87 to 88</td><td></td><td></td></td<>	Shore D ⁵	87 to 88		
Tensile Modulus ASTM D638 7 2540 to 2620 MPa 8 2910 to 2990 MPa 9 2620 to 2740 MPa 10 6.88 to 692 MPa 11 56.9 to 57.1 MPa 12 55.9 to 57.1 MPa 13 56.9 to 57.1 MPa 14 56.9 to 57.1 MPa 15 68.0 to 12 MPa Tensile Elogation % MPa Tensile Modulus 7.0 to 8.0 % Flexuel Modulus % MPa -16 2300 to 2480 MPa -17 2300 to 2480 MPa -19 2400 to 2450 MPa -19 2300 to 2480 MPa -19 818 to 83.8 MPa -19 818 to 83.8 MPa -19 138 to 85.0 91.5 MPa -12 138 to 85.0 91.5 MPa -12 14 to 256 MPa -12	Shore D ⁶	84 to 85		
- 12540 to 2620MPa- 82910 to 2930MPa- 92620 to 2740MPa- 1650 to 2740MPa- 10650 to 57.1MPa- 11560 to 57.1MPa- 1251.7 to 54.9MPa- 13500 to 12%Break ¹³ 60 to 12%Break ¹³ 200 to 2480MPa- 14230 to 2480MPa- 14230 to 2490MPa- 14230 to 2490MPa- 14230 to 2490MPa- 14330 to 2490MPa- 19Mato 38.8MPa- 19Mato 38.8MPa- 19Mato 38.8MPa- 2013 to 38.9MPa- 2131 to 25.0MPa- 2214 to 26MPa- 2414 to 26//m- 2414 to 26//m <td< td=""><td>Mechanical</td><td>Nominal Value</td><td>Unit</td><td>Test Method</td></td<>	Mechanical	Nominal Value	Unit	Test Method
	Tensile Modulus			ASTM D638
⁹ Note Cat Name ⁹ 2620 to 2740 MPa Tensile Strength MPa ASTM D638 ¹⁹ 6.88 to 692 MPa ¹⁰ 5.9 to 57.1 MPa 10 5.0 to 12 MPa Tensile Elongation 5.0 to 12 Ma Break ¹³ 6.0 to 12 Ma Break ¹³ 6.0 to 12 MPa -10 260 to 2480 MPa -17 230 to 2490 MPa -19 230 to 2490 MPa -19 81.8 to 83.8 MPa -19 81.8 to 83.0 MPa -19 81.8 to 83.0 MPa -19 81.8 to 85.0 MPa -19 1.8 to 85.0 MPa -19 1.8 to 85.0 MPa -19	7	2540 to 2620	MPa	
Teshile Strength ASTM D638 -1 ¹⁰ 688 to 69.2 MPa -1 ¹¹ 56.9 to 57.1 MPa -1 ¹² 51.7 to 54.9 MPa Tensile Elongation X ASTM D638 Break ¹³ 6.0 to 12 % Break ¹³ 6.0 to 12 % Break ¹³ 0.0 to 2.0 % Break ¹³ 2.00 to 2.400 % -1 ¹⁶ 2.300 to 2.400 MPa -1 ¹⁷ 2.300 to 2.400 MPa -1 ¹⁸ 2.000 to 2.450 MPa -1 ¹⁹ 8.18 to 83.8 MPa -1 ¹⁹ 8.18 to 83.8 MPa -2 ¹⁰ 1.10 to 2.6 MPa -2 ¹⁰ 8.20 to 7.0 MPa -2 ¹⁰ 1.10 to 2.6 MPa -2 ¹⁰ 1.10 to 2.6 MPa -2 ¹¹ 1.10 to 2.6 M	8	2910 to 2990	MPa	
-1°688 to 69.2MPa-1°569 to 57.1MPa-1°517 to 54.9MPaTenslie Liongation5.0 to 12.0%Break ¹³ 6.0 to 12.0%Break ¹⁴ 7.0 to 8.0%Break ¹⁴ 200 to 2.400MPa-1°230 to 2.400MPa-1°230 to 2.400MPa-1°230 to 2.400MPa-1°230 to 2.400MPa-1°230 to 2.400MPa-1°230 to 2.400MPa-1°30 to 2.400MPa-1°30 to 2.400MPa-1°160 to 2.450MPa-1°818 to 8.3MPa-1°818 to 8.5 to 15.0MPa-1°160 to 2.450MPa-1°170 to 8.0MPa-1°181 to 8.3 ko 16.7MPa-1°Nomini ValueUnitNotched lizod ImpactKortanMPa-1°16 to 25J/m-1°16 to 25J/m-1°16 to 25So to 58.0-1°50 to 58.0C-1°70 to 82.0C18 MPa, Unannealed ²⁴ 50 to 58.0C-1°16 to 58.0C-1°70 to 82.0C-1°10 to 66.0C-1°10 to 66.0C-1°10 to 66.5m/m-1°10 to 66.5m/m-1°10 to 66.5m/m-1°10 to 66.5m/m-1°	9	2620 to 2740	MPa	
Internation Internation Internation -1 ¹² 563 to 57.1 MPa -1 ¹² 517 to 54.9 MPa Tensile Elongation K K Break ¹³ 6.0 to 12 % Break ¹⁴ 7.0 to 8.0 % Break ¹⁵ 8.0 to 12 % Break ¹⁵ 8.0 to 12 % Fecural Modulus % K	Tensile Strength			ASTM D638
12 100 to 514 Mind 11 ² 517 to 544 MPa Tensile Elongation \$ StM D638 Break ¹³ 6.0 to 12 % Break ¹⁴ 7.0 to 8.0 % Break ¹⁵ 8.0 to 12 % Break ¹⁵ 8.0 to 12 % Flexural Modulus % StM D790	10	68.8 to 69.2	MPa	
Initial Construction ASTM D638 Break 13 6.0 to 12 % Break 14 7.0 to 8.0 % Break 15 8.0 to 12 % Break 15 8.0 to 12 % Flexural Modulus %	11	56.9 to 57.1	MPa	
Break 6 0 to 12 % Break 7.0 to 8.0 % Break 7.0 to 8.0 to 12 % Break 8.0 to 12 % Break 15 8.0 to 12 % Flexural Modulus X X X - 16 2360 to 2480 MPa X - 17 2330 to 2490 MPa X - 18 2400 to 2450 MPa X Flexural Strength 2400 to 2450 MPa X - 19 81.8 to 83.8 MPa X - 20 88.5 to 91.5 MPa X - 21 83.8 to 87 MPa X Impact Moninal Value Not X - 22 13 to 25 J/m X - 23 14 to 26 J/m X - 24 13 to 25 J/m X - 41 Monanealed 24 95.0 to 97.0 C 0.45 MPa, Unannealed 24 95.0 to 97.0 C X	12	51.7 to 54.9	MPa	
Break 147.0 to 8.0%Break 158.0 to 12%Break 158.0 to 12%Break 149.0 to 12%In 162.360 to 2480MPa- 172.300 to 2490MPa- 182.400 to 2450MPaFlexural Strength4.000 to 2450MPa- 198.18 to 83.8MPa- 198.18 to 83.7MPa- 208.85 to 91.5MPa- 218.81 to 86.7MPaImpactNominal ValueUnitTest MethodNotchel Icol ImpactJMain 22ASTM D256A- 2213 to 25J/mTest MethodNotchel Icol ImpactVominal ValueUnitTest MethodOut 61/20 All manealed 2595.0 to 97.0CC0.45 MPA, Unannealed 2555.0 to 56.0CC1.8 MPA, Unannealed 2795.0 to 97.0CC1.8 MPA, Unannealed 2795.0 to 97.0CC1.8 MPA, Unannealed 2795.0 to 97.0CC1.8 MPA, Unannealed 2795.0 to 50.0CC1.8 MPA, Unannealed 2795.0 to 50.0CC1.8 MPA, Unannealed 2795.0 to 50.0CC1.9 MPA, Unannealed 2795.0 to 50.0C </td <td>Tensile Elongation</td> <td></td> <td></td> <td>ASTM D638</td>	Tensile Elongation			ASTM D638
Break % Flexural Modulus ASTM D790 -1° 2360 to 2480 MPa -1° 2330 to 2490 MPa -1° 2400 to 2450 MPa -1° 2400 to 2450 MPa Flexural Strength 451 to 83.8 MPa -1° 81.8 to 83.8 MPa -20 88.5 to 91.5 MPa -21 83.8 to 86.7 MPa -21 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notchel Icol Impact Ja to 25 J/m Stot 056.0 -22 13 to 25 J/m Stot 056.0 Stot 056.0 -23 14 to 26 J/m Test Method Deflection Temperature Under Load 50.0 to 97.0 'C Stot 056.0 0.45 MPA, Unannealed ²⁴ 95.0 to 97.0 'C Stot 056.0 1.8 MPA, Unannealed ²⁵ 50.0 to 86.0 'C Stot 154.0 -28 70.0 to 86.0 'C Stot 154.0	Break ¹³	6.0 to 12	%	
Flexual Modulus ASTM D790 - 1 ⁶ 2360 to 2480 MPa - 1 ⁷ 2330 to 2490 MPa - 1 ⁸ 2400 to 2450 MPa Flexual Strength MSA MSA - 1 ⁹ 818 to 83.8 MPa - 2 ¹⁰ 88.5 to 91.5 MPa - 2 ¹⁰ 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notched Izod Impact Jato 25 J/m Stom D256A - 2 ²⁰ 13 to 25 J/m Stom D256A - 2 ²³ 14 to 26 J/m Stom D256A - 2 ²⁴ 150 to 58.0 C Stom D26A 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C Stom D46A 0.45 MPa, Unannealed ²⁴ 95.0 to 58.0 °C Stom D56A 1.8 MPa, Unannealed ²⁴ 95.0 to 58.0 °C Stom D54S 1.8 MPa, Unannealed ²⁴ 95.0 to 58.0 °C Stom D54S 1.8 MPa, Unannealed ²⁴ 70.0 to 82.0 °C Stom E154S - 2 ³⁰ 70.0 to 82.0 °C Stom E354	Break ¹⁴	7.0 to 8.0	%	
- 16 2360 to 2480 MPa - 17 2330 to 2490 MPa - 18 2400 to 2450 MPa Elexural Strength MSa MSa - 19 81.8 to 83.8 MPa - 20 88.5 to 91.5 MPa - 21 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notched Izod Impact Ja to 25 J/m Stand D256A - 23 13 to 25 J/m Stand D26A - 23 14 to 26 J/m Stand D26A - 23 14 to 26 J/m Stand D26A - 24 9.50 to 97.0 *C Stand D26A 0.45 MPa, Unannealed 24 95.0 to 97.0 *C Stand D26A 0.45 MPa, Unannealed 25 55.0 to 58.0 *C Stand D26A 1.8 MPa, Unannealed 26 48.0 to 50.0 *C Stand E1545 - 28 7.0 to 82.0 *C Stand E1545 - 28 7.0 to 86.0 *C Stand E1545 - 28 7.0 to 9.40 *C Stand E1545 - 28	Break ¹⁵	8.0 to 12	%	
17 2330 to 2490 MPa 18 2400 to 2450 MPa Flexural Strength 2400 to 2450 MPa 19 81.8 to 83.8 MPa 20 88.5 to 91.5 MPa 21 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notchel Izod Impact J/m STM D256A 22 13 to 25 J/m STM D256A 23 14 to 26 J/m STM D256A 24 13 to 25 J/m STM D266A 0.45 MPa, Unannealed 24 95.0 to 97.0 Test Method 0.45 MPa, Unannealed 24 95.0 to 97.0 "C 0.45 MPa, Unannealed 25 5.0 to 58.0 "C 1.8 MPa, Unannealed 26 48.0 to 50.0 "C 1.8 MPa, Unannealed 27 79.0 to 82.0 "C 28 71.0 to 86.0 "C 28 71.0 to 86.0 "C 28 71.0 to 86.0 "C 29 70.0 to 94.0 "C -29 70.0 to 94.0 "C	Flexural Modulus			ASTM D790
International action	16	2360 to 2480	MPa	
Flexural Strength ASTM D790 - ¹⁹ 81.8 to 83.8 MPa - ²⁰ 88.5 to 91.5 MPa - ²¹ 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notched Izod Impact Is to 25 J/m STM D256A - ²² 13 to 25 J/m STM D256A - ²³ 14 to 26 J/m Ste Method Deflection Temperature Under Load Mominal Value Unit Test Method 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 "C Ste	17	2330 to 2490	MPa	
- ¹⁹ 81.8 to 83.8 MPa - ²⁰ 88.5 to 91.5 MPa - ²¹ 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notcle Izod Impact //m STM D256A - ²² 13 to 25 J/m - ²³ 14 to 26 J/m Perfection Temperature Under Load Votit Test Method 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 1.8 MPa, Unannealed ²⁴ 95.0 to 88.0 °C 1.8 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C - ²⁸ 71.0 to 86.0 °C - ²⁹ 70.0 to 82.0 °C - ²⁹ 71.0 to 86.0 °C - ²⁹ 70.0 to 82.0 °C - ²⁹ 70.0 to 94.0 °C - ²⁹ 70.0 to 94.0 °C - ²⁹ 6.5E-5 to 6.8E-5 cm/cm/°C - ⁴⁰ to 0°C ³⁰ 6.4E-5 to 7.2E-5 cm/cm/°C <td> 18</td> <td>2400 to 2450</td> <td>MPa</td> <td></td>	18	2400 to 2450	MPa	
²⁰ 88.5 to 91.5 MPa ²¹ 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notched Izod Impact J/m STM D256A ²² 13 to 25 J/m ²³ 14 to 26 J/m Thermal Nominal Value Unit Test Method 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C ASTM D648 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C Impact 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C Impact 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Impact ²⁸ 71.0 to 86.0 °C Impact ²⁹ 70.0 to 94.0 °C Impact ²⁸ 71.0 to 86.0 °C Impact ²⁹ 70.0 to 94.0 °C Impact ²⁰ 6.5E-5 to 6.8E-5 Cm/cm/°C Impact ²⁰ 6.5E-5 to 6.8E-5 Cm/cm/°C Impact	Flexural Strength			ASTM D790
²¹ 83.8 to 86.7 MPa Impact Nominal Value Unit Test Method Notched izod Impact	19	81.8 to 83.8	MPa	
83.8 t0 86.7 Wra Impact Nominal Value Unit Test Method Notched Izod Impact ASTM D256A ASTM D256A ²² 13 to 25 J/m Impact Mominal Value Impact ASTM D256A ²³ 14 to 26 J/m Impact Test Method Impact Deflection Temperature Under Load Nominal Value Unit Test Method Impact 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C Impact ASTM D648 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C Impact Impact Impact 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C Impact Impact Impact - ⁻²⁸ 71.0 to 86.0 °C Impact Impact ASTM E831 - ⁻²⁹ 76.0 to 94.0 °C Impact Impact ASTM E831 - ⁴⁰ to 0°C ³⁰ 6.5E-5 to 6.8E-5 Impact Impact Impact Impact - ⁴⁰ to 0°C ³¹ 6.4E-5 to 7.2E-5 Impact Impact <td> 20</td> <td>88.5 to 91.5</td> <td>MPa</td> <td></td>	20	88.5 to 91.5	MPa	
Notched Izod Impact ASTM D256A - ²² 13 to 25 J/m - ²³ 14 to 26 J/m Thermal Nominal Value Unit Test Method Deflection Temperature Under Load % STM D648 STM D648 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C STM D648 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C STM C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C STM E1545 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C STM E1545 - ²⁸ 71.0 to 86.0 °C STM E1545 - ²⁹ 70.0 to 94.0 °C STM E1545 - ²⁹ 70.0 to 94.0 °C STM E1545 - ²⁹ 70.0 to 94.0 °C STM E1545 - ²⁰ 6.5E-5 to 6.8E-5 cm/cm/°C STM E831 - 40 to 0°C ³⁰ 6.4E-5 to 7.2E-5 cm/cm/°C STM E35	21	83.8 to 86.7	MPa	
²² 13 to 25 J/m ²³ 14 to 26 J/m Thermal Nominal Value Unit Test Method Deflection Temperature Under Load Mominal Value ASTM D648 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	Impact	Nominal Value	Unit	Test Method
²³ 14 to 26 J/m Thermal Nominal Value Unit Test Method Deflection Temperature Under Load S5.0 to 97.0 °C ASTM D648 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C ASTM D648 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C ASTM D648 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C ASTM E1545 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C ASTM E1545 Glass Transition Temperature ASTM E1545 ASTM E1545 ²⁸ 71.0 to 86.0 °C ASTM E1545 ²⁹ 76.0 to 94.0 °C ASTM E1545 CLTE - Flow ASTM E831 ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C	Notched Izod Impact			ASTM D256A
Thermal Nominal Value Unit Test Method Deflection Temperature Under Load ASTM D648 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	22	13 to 25	J/m	
Deflection Temperature Under Load ASTM D648 0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow 200 °C -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	23	14 to 26	J/m	
0.45 MPa, Unannealed ²⁴ 95.0 to 97.0 °C 0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow XSTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C	Thermal	Nominal Value	Unit	Test Method
0.45 MPa, Unannealed ²⁵ 55.0 to 58.0 °C 1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow To to 86.5 cm/cm/°C -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C	Deflection Temperature Under Load			ASTM D648
1.8 MPa, Unannealed ²⁶ 48.0 to 50.0 °C 1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow -700 to 0°C ³⁰ 6.5E - 5 to 6.8E - 5 -40 to 0°C ³¹ 6.4E - 5 to 7.2E - 5 cm/cm/°C	0.45 MPa, Unannealed ²⁴	95.0 to 97.0	°C	
1.8 MPa, Unannealed ²⁷ 79.0 to 82.0 °C Glass Transition Temperature ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	0.45 MPa, Unannealed ²⁵	55.0 to 58.0	°C	
ASTM E1545 ²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	1.8 MPa, Unannealed ²⁶	48.0 to 50.0	°C	
²⁸ 71.0 to 86.0 °C ²⁹ 76.0 to 94.0 °C CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	1.8 MPa, Unannealed ²⁷	79.0 to 82.0	°C	
²⁹ 76.0 to 94.0 °C CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	Glass Transition Temperature			ASTM E1545
CLTE - Flow ASTM E831 -40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C		71.0 to 86.0	°C	
-40 to 0°C ³⁰ 6.5E-5 to 6.8E-5 cm/cm/°C -40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	29	76.0 to 94.0	°C	
-40 to 0°C ³¹ 6.4E-5 to 7.2E-5 cm/cm/°C	CLTE - Flow			ASTM E831
		6.5E-5 to 6.8E-5	cm/cm/°C	
0 to 50°C ³² 8.5E-5 to 9.5E-5 cm/cm/°C		6.4E-5 to 7.2E-5	cm/cm/°C	
	0 to 50°C ³²	8.5E-5 to 9.5E-5	cm/cm/°C	

0 to 50°C ³³	7.5E-5 to 1.1E-4	cm/cm/°C	
50 to 100°C ³⁴	9.9E-5 to 1.1E-4	cm/cm/°C	
50 to 100°C ³⁵	9.4E-5 to 1.2E-4	cm/cm/°C	
100 to 150°C ³⁶	1.5E-4 to 1.6E-4	cm/cm/°C	
100 to 150°C ³⁷	1.4E-4 to 1.7E-4	cm/cm/°C	
Electrical	Nominal Value	Unit	Test Method
Dielectric Strength			ASTM D149
38	15 to 16	kV/mm	
39	14 to 15	kV/mm	
Dielectric Constant			ASTM D150
60 Hz ⁴⁰	3.50 to 3.60		
60 Hz ⁴¹	3.40 to 3.50		
1 kHz ⁴²	3.30 to 3.40		
1 kHz ⁴³	3.40 to 3.50		
1 MHz ⁴⁴	3.20 to 3.30		
1 MHz ⁴⁵	3.10 to 3.20		
NOTE			
1.	UV Postcure & Thermal Post	cure	
2.	UV Postcure at HOC -2		
3.	UV Postcure at HOC -2		
4.	UV Postcure & Thermal Postcure		
5.	UV Postcure & Thermal Postcure		
6.	UV Postcure at HOC -2		
7.	UV Postcure at HOC +3		
8.	UV Postcure & Thermal Post	cure	
9.	UV Postcure at HOC -2		
10.	UV Postcure & Thermal Postcure		
11.	UV Postcure at HOC +3		
12.	UV Postcure at HOC -2		
13.	UV Postcure at HOC -2		
14.	UV Postcure & Thermal Postcure		
15.	UV Postcure at HOC +3		
16.	UV Postcure at HOC -2		
17.	UV Postcure & Thermal Postcure		
18.	UV Postcure at HOC +3		
19.	UV Postcure at HOC -2		
20.	UV Postcure & Thermal Post	cure	
21.	UV Postcure at HOC +3		
22.	UV Postcure & Thermal Post	cure	
23.	UV Postcure at HOC -2		
	UV Posicure at HOC -2		
24.	UV Postcure & Thermal Post	cure	

26.	UV Postcure at HOC -2
27.	UV Postcure & Thermal Postcure
28.	UV Postcure at HOC -2
29.	UV Postcure & Thermal Postcure
30.	UV Postcure at HOC -2
31.	UV Postcure & Thermal Postcure
32.	UV Postcure at HOC -2
33.	UV Postcure & Thermal Postcure
34.	UV Postcure & Thermal Postcure
35.	UV Postcure at HOC -2
36.	UV Postcure at HOC -2
37.	UV Postcure & Thermal Postcure
38.	UV Postcure & Thermal Postcure
39.	UV Postcure at HOC -2
40.	UV Postcure & Thermal Postcure
41.	UV Postcure at HOC -2
42.	UV Postcure at HOC -2
43.	UV Postcure & Thermal Postcure
44.	UV Postcure & Thermal Postcure
45.	UV Postcure at HOC -2

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