

VALOXTM FR RESIN ENH4565

REGION AMERICAS

DESCRIPTION

VALOX ENH4565 is a 33% glass reinforced, non-chlorinated/brominated flame retardant Polybutylene Terephthalate (PBT) injection moldable grade with excellent chemical resistance. It has a UL94V0@0.75mm flame rating. This is a good candidate for a variety of applications needing a sustainable FRPBT solution.

TYPICAL PROPERTY VALUES

Revision 20231109

RECHANICAL ***ID** TYPICAL VALUES WITS** RETAMETHODS MECHANICAL ***ID** ***ID*** ***ID*** ***ID*** Tensile Stress, yid, Type I, 5 mm/min 137 Mea ASTM D638 Tensile Stress, byd, Type I, 5 mm/min 137 Mea ASTM D638 Tensile Stress, byd, Type I, 5 mm/min 2.4 % ASTM D638 Tensile Stress, byd, S mm/min 1800 Mea ASTM D638 Flexural Stress, yid, 1,3 mm/min, 50 mm span 180 Mea ASTM D638 Flexural Modulus, 1,3 mm/min, 50 mm span 9400 Mea ASTM D790 Tensile Strain, yield, 5 mm/min 140 Mea 180 527 Tensile Strain, yield, 5 mm/min 2.4 % 180 527 Tensile Strain, yield, 5 mm/min 11500 Mea 180 527 Tensile Strain, yield, 5 mm/min 11500 Mea 180 527 Tensile Strain, yeld, 5 mm/min 11500 Mea 180 527 Tensile Strain, yeld, 5 mm/min 11500 Mea 180 527 Tensile Strain, yeld, 5 mm/min 180 Mea <th></th> <th></th> <th></th> <th></th>				
Tensile Stress, Iyl, Type I, 5 mm/min 137 MPa ASTM D638 Tensile Stress, Drk, Type I, 5 mm/min 137 MPa ASTM D638 Tensile Strain, Jrk, Type I, 5 mm/min 2.4 % ASTM D638 Tensile Strain, Jrk, Type I, 5 mm/min 11600 MPa ASTM D638 Tensile Strain, Jrk, Type I, 5 mm/min 11600 MPa ASTM D638 Tensile Stress, Jrk, 13 mm/min, 50 mm span 1800 MPa ASTM D790 Resural Modulus, 13 mm/min, 50 mm span 4900 MPa ASTM D790 Tensile Stress, Jreak, 5 mm/min 140 MPa 150 527 Tensile Strain, Yield, 5 mm/min 2.4 % 150 527 Tensile Strain, break, 5 mm/min 140 MPa 150 527 Tensile Strain, break, 5 mm/min 2.4 % 150 527 Tensile Strain, break, 5 mm/min 1800 MPa 150 527 Tensile Strain, break, 5 mm/min 1800 MPa 150 782 Tensile Strain, break, 5 mm/min 24 % 150 782 Tensile Strain, break, 5 mm/min 1800	PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
Tensile Stress, brk. Type i, 5 mm/min 137 MPa ASTM D638 Tensile Strain, ykl. Type i, 5 mm/min 2.4 % ASTM D638 Tensile Strain, ykl. Type i, 5 mm/min 11600 MPa ASTM D638 Flexural Stress, ykl. 1.3 mm/min, 50 mm span 180 MPa ASTM D790 Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Flexural Modulus, 1.3 mm/min, 50 mm span 140 MPa ASTM D790 Tensile Stress, ykl. 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Stress, preak, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Stress, yield, 5 mm/min 140 MPa ISO 527 Tensile Stress, yield, 5 mm/min 140 MPa ISO 527 Tensile Stress, yield, 5 mm/min 185 MPa ISO 527 Tensile Stress, yield, 5 mm/min 185 MPa ISO 179 Tensile Stress, yield, 5 mm/min 185 MP	MECHANICAL (1)			
Tensile Strain, yid, Yige I, 5 mm/min 2.4 % ASTM D638 Tensile Strain, brik, Yige I, 5 mm/min 2.4 % ASTM D638 Tensile Modulus, 5 mm/min 11600 MPa ASTM D638 Flexural Modulus, 7 mm/min, 50 mm span 180 MPa ASTM D639 Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Tensile Stress, yield, 5 mm/min 140 MPa S0 527 Tensile Stress, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 11500 MPa S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 527 Tensile Strain, break, 5 mm/min 2.4 % S0 178	Tensile Stress, yld, Type I, 5 mm/min	137	MPa	ASTM D638
Tensile Strain, brk, Type I, 5 mm/min 2.4 % ASTM D638 Tensile Modulus, 5 mm/min 11600 MPa ASTM D638 Flexural Modulus, 5 mm/min 11600 MPa ASTM D790 Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 2.4 % ISO 527 Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, yield, 5 mm/min 11500 MPa ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 178 Flexural Modulus, 2 mm/min 185 MPa ISO 179 Flexural Modulus, 2 mm/min 185 MPa ISO 179 Charpy Impact, unnotched, 23°C 60 I/I/m² ISO 179/12C Charpy Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 23°C 80 J/m ASTM D4812 Izod Impact, notched, 23°C 80 J/m ASTM D256	Tensile Stress, brk, Type I, 5 mm/min	137	MPa	ASTM D638
Tensile Modulus, 5 mm/min 11600 MPa ASTM D638 Flexural Stress, yld, 1.3 mm/min, 50 mm span 180 MPa ASTM D790 Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Tensile Stress, yild, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, Dreak, 5 mm/min 11500 MPa ISO 527 Tensile Strain, Dreak, 5 mm/min 2.4 % ISO 527 Tensile Strain, Dreak, 5 mm/min 11500 MPa ISO 178 Tensile Strain, Dreak, 5 mm/min 2.4 % ISO 178 Tensile Strain, Dreak, 5 mm/min 185 MPa ISO 178 Tensile Strain, Dreak, Drammin 185 MPa ISO 178 Tensile Strain, Dreak, Drammin 185 MPa ISO 178 Tensile Strain, Dreak, Drammin 185 MPa ISO 178 Elevarl Strain, Unnotched, Ja°C 60 J/m ASTM D481 <td>Tensile Strain, yld, Type I, 5 mm/min</td> <td>2.4</td> <td>%</td> <td>ASTM D638</td>	Tensile Strain, yld, Type I, 5 mm/min	2.4	%	ASTM D638
Flexural Stress, yield, 1.3 mm/min, 50 mm span 180 MPa ASTM D790 Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Tensile Stress, yield, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 2.4 % ISO 527 Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, break, 5 mm/min 11500 MPa ISO 527 Flexural Stress, yield, 2 mm/min 1850 MPa ISO 527 Flexural Modulus, 1 mm/min 11500 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 179/2C Charpy Impact, unnotched, 23°C 60 M/m² ISO 179/2C Charpy Impact, unnotched, 23°C 80 J/m² ASTM D4812 Izod Impact, unnotched, 23°C 80 J/m² ASTM D4812 Izod Impact, notched, 23°C 80 J/m² ASTM D256 Izod Impact, notched, 30°C 9 J/m² ASTM D256	Tensile Strain, brk, Type I, 5 mm/min	2.4	%	ASTM D638
Flexural Modulus, 1.3 mm/min, 50 mm span 9400 MPa ASTM D790 Tensile Stress, yield, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Strain, break, 5 mm/min 2.4 % ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 527 Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 178 Flexural Modulus, 2 mm/min 60 kl/m² ISO 179/2C Charpy Impact, unnotched, 23°C 60 kl/m² ISO 179/2C Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 23°C 80 J/m ASTM D4812 Izod Impact, notched, 30°C 60 J/m ASTM D256 Izod Impact, notched, 30°C 9 J ASTM D256 Izod Impact, notched, 30°C 14 kl/m² ISO 180/1A Izod Impact, notched 80°10°4 - 23°C 14 kl/m² ISO 180/1A <t< td=""><td>Tensile Modulus, 5 mm/min</td><td>11600</td><td>MPa</td><td>ASTM D638</td></t<>	Tensile Modulus, 5 mm/min	11600	MPa	ASTM D638
Tensile Stress, yield, 5 mm/min 140 MPa ISO 527 Tensile Stress, break, 5 mm/min 2.4 % ISO 527 Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, break, 5 mm/min 2.4 % ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 150 Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 Flexural Modulus, 2 mm/min 850 MPa ISO 178 IMPACT ⁽¹⁾ U ISO 179 JCC ISO 179 JCC Charpy Impact, unnotched, 23°C 60 IsJ Jm² ISO 179 JCC Lood Impact, unnotched, 23°C 800 J/m ASTM 04812 Izod Impact, unotched, 23°C 800 J/m ASTM 04812 Izod Impact, unotched, 30°C 600 J/m ASTM 0256 Izod Impact, notched, 30°C 9 J ASTM 0256 Izod Impact, notched 80°10°4 + 23°C 14 Kl/m² ISO 180/1A Izod Impact, notched, 30°C 12 Kl/m² ISO 180/1A Izod Impact, notch	Flexural Stress, yld, 1.3 mm/min, 50 mm span	180	MPa	ASTM D790
Tensile Stress, break, 5 mm/min 140 MPa ISO 527 Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, break, 5 mm/min 2.4 % ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 527 Tensile Modulus, 2 mm/min 185 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 178 IMPACT ************************************	Flexural Modulus, 1.3 mm/min, 50 mm span	9400	MPa	ASTM D790
Tensile Strain, yield, 5 mm/min 2.4 % ISO 527 Tensile Strain, break, 5 mm/min 2.4 % ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 527 Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 178 IMPACT ⁽¹⁾ *** *** ISO 179/2C Charpy Impact, unnotched, 23°C 60 kl/m² ISO 179/2C Charpy Impact, unnotched, 23°C 60 l/m ASTM D4812 Izod Impact, unnotched, 23°C 800 l/m ASTM D4812 Izod Impact, notched, 23°C 80 l/m ASTM D4812 Izod Impact, notched, 30°C 80 l/m ASTM D256 Izod Impact, notched, 30°C 9 l ASTM D363 Izod Impact, notched 80°10°4 +23°C 14 kl/m² ISO 180/1A Izod Impact, notched, 90°0°4 +23°C 12 kl/m² ISO 180/1A Izod Impact, notched, 30°C 12 kl/m² ISO 179/2C Charpy Impact, notche	Tensile Stress, yield, 5 mm/min	140	MPa	ISO 527
Tensile Strain, break, 5 mm/min 2.4 % ISO 527 Tensile Modulus, 1 mm/min 11500 MPa ISO 527 Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 Hexural Modulus, 2 mm/min 9400 MPa ISO 178 IMPACT ¹¹ USD 179/2C ISO 179/2C Charpy Impact, unnotched, 23°C 60 k1/m² ISO 179/2C Load Impact, unnotched, 23°C 800 J/m ASTM D4812 Load Impact, unnotched, 30°C 600 J/m ASTM D2812 Load Impact, notched, 23°C 80 J/m ASTM D2812 Load Impact, notched, 30°C 60 J/m ASTM D256 Load Impact, notched, 30°C 80 J/m ASTM D256 Load Impact, notched, 30°C 9 J ASTM D3763 Load Impact, notched 80°10°4 +23°C 14 k1/m² ISO 180/1A Load Impact, notched, 23°C 12 k1/m² ISO 180/1A Load Impact, notched, 23°C 12 k1/m² ISO 180/1A Load Impact, notched, 23°C 2 <td>Tensile Stress, break, 5 mm/min</td> <td>140</td> <td>MPa</td> <td>ISO 527</td>	Tensile Stress, break, 5 mm/min	140	MPa	ISO 527
Tensile Modulus, 1 mm/min 11500 MPa ISO 527 Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 IMPACT (1) ISO 178 IMPACT (2004) ISO 179 Charpy Impact, unnotched, 23°C 60 kJ/m² ISO 179/2C Lzod Impact, unnotched, 23°C 800 J/m² ASTM D4812 Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, notched, 23°C 80 J/m ASTM D4812 Izod Impact, notched, 30°C 80 J/m ASTM D256 Izod Impact, notched, 30°C 80 J/m ASTM D256 Izod Impact, notched, 30°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 +23°C 14 kJ/m² ISO 180/1A Izod Impact, notched, 23°C 12 kJ/m² ISO 180/1A Izod Impact, notched, 23°C 12 kJ/m² ISO 180/1A Izod Impact, notched, 23°C 2 KJ/m² ISO 180/1A Izod Impact, notc	Tensile Strain, yield, 5 mm/min	2.4	%	ISO 527
Flexural Stress, yield, 2 mm/min 185 MPa ISO 178 Flexural Modulus, 2 mm/min 9400 MPa ISO 178 IMPACT (*)** ***********************************	Tensile Strain, break, 5 mm/min	2.4	%	ISO 527
Flexural Modulus, 2 mm/min 9400 MPa ISO 178 MPACT (1)	Tensile Modulus, 1 mm/min	11500	MPa	ISO 527
IMPACT (¹¹) Charpy Impact, unnotched, 23°C 60 kJ/m² ISO 179/2C Charpy Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 30°C 600 J/m ASTM D256 Izod Impact, notched, 23°C 80 J/m ASTM D256 Izod Impact, notched, 30°C 60 J/m ASTM D3763 Izod Impact, notched 80°10°4 + 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 + 23°C 14 kJ/m² ISO 180/1A Izod Impact, notched 80°10°4 + 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 23°C 25 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2 mm, unannealed 206 °C ASTM D648 HDT, 2.40°C to 40°C, flow 1,9c0 </td <td>Flexural Stress, yield, 2 mm/min</td> <td>185</td> <td>MPa</td> <td>ISO 178</td>	Flexural Stress, yield, 2 mm/min	185	MPa	ISO 178
Charpy Impact, unnotched, 23°C 60 kJ/m² ISO 179/2C Charpy Impact, unnotched, 30°C 60 kJ/m² ISO 179/2C Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, 30°C 600 J/m ASTM D256 Izod Impact, notched, 30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 + 23°C 14 kJ/m² ISO 180/1A Izod Impact, notched 80°10°4 - 30°C 14 kJ/m² ISO 179/2C Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 30°C 20 ASTM D1525 THERMAL (1) Vicat Softening Temp, Rate B/50 20 C ASTM D648 HDT, 0.45 MPa, 3.2 mm, unannealed 206 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 1,9c ASTM E831 CTE, 40°C to 40°C, flow 1,9c ASTM E831 CT	Flexural Modulus, 2 mm/min	9400	MPa	ISO 178
Charpy Impact, unnotched, -30°C 60 kJ/m² ISO 179/2C Izod Impact, unnotched, 23°C 800 J/m ASTM D4812 Izod Impact, unnotched, -30°C 600 J/m ASTM D256 Izod Impact, notched, -30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 +23°C 14 kJ/m² ISO 180/1A Izod Impact, notched, 30°C 14 kJ/m² ISO 180/1A Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2 mm, unannealed 206 °C ASTM E831 CTE, -40°C to 40°C, flow 7.605 1/°C ASTM E831 CTE, -40°C to 40°C, flow 2.605 1/°C ASTM E831	IMPACT (1)			
Izad Impact, unnotched, 23°C 800 J/m ASTM D4812 Izad Impact, unnotched, 30°C 600 J/m ASTM D4812 Izad Impact, notched, 23°C 80 J/m ASTM D256 Izad Impact, notched, -30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izad Impact, notched 80°10°4 + 23°C 14 kl/m² ISO 180/1A Charpy Impact, notched, 23°C 14 kl/m² ISO 179/2C Charpy Impact, notched, 23°C 12 kl/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kl/m² ISO 179/2C Charpy Impact, notched, -30°C 20 ASTM D1525 THERMAL (1) V C ASTM D1525 THERMAL (20) 20 20 ASTM D648 HDT, 0.45 MPa, 3.2 mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9°C ASTM E831 CTE, -40°C to 40°C, xflow 2.605 1/°C ASTM E831 CTE, -40°C to 40°C, flow 2.605	Charpy Impact, unnotched, 23°C	60	kJ/m²	ISO 179/2C
Izod Impact, unnotched, 30°C 600 J/m ASTM D4812 Izod Impact, notched, 23°C 80 J/m ASTM D256 Izod Impact, notched, -30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 + 23°C 14 kJ/m² ISO 180/1A Izod Impact, notched 80°10°4 - 30°C 12 kJ/m² ISO 180/1A Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, 30°C 205 °C ASTM D525 HDT, 0.45 MPa, 3.2 mm, unannealed 205 °C ASTM D648 HDT, 1.82 MPa, 3.2 mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1,9C ASTM E831 CTE, -40°C to 40°C, xflow 2,E-05 1/°C ASTM E831	Charpy Impact, unnotched, -30°C	60	kJ/m²	ISO 179/2C
Izod Impact, notched, 23°C 80 J/m ASTM D256 Izod Impact, notched, -30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 + 23°C 14 KJ/m² ISO 180/1A Izod Impact, notched 80°10°4 - 30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C THERMAL (¹) Vicat Softening Temp, Rate B/50 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2 mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 2.E-05 1/°C ASTM E831	Izod Impact, unnotched, 23°C	800	J/m	ASTM D4812
Izod Impact, notched, -30°C 60 J/m ASTM D256 Instrumented Dart Impact Total Energy, 23°C 9 J ASTM D3763 Izod Impact, notched 80°10°4 +23°C 14 kJ/m² ISO 180/1A Izod Impact, notched 80°10°4 -30°C 14 kJ/m² ISO 179/2C Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C THERMAL (¹) Vicat Softening Temp, Rate B/50 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2 mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 2.E-05 1/°C ASTM E831	Izod Impact, unnotched, -30°C	600	J/m	ASTM D4812
Instrumented Dart Impact Total Energy, 23°C 9 1 ASTM D3763 Izod Impact, notched 80°10°4 +23°C 14 IkJ/m² ISO 180/1A Izod Impact, notched 80°10°4 -30°C 14 IkJ/m² ISO 180/1A Charpy Impact, notched, 23°C 12 IkJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 IkJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 IkJ/m² ISO 179/2C THERMAL (1) IKJ/m² ISO 179/2C ASTM D1525 IMD D648 THERMAL (1) IKJ/m² IKJ/m² ISO 179/2C THERMAL (1) IKJ/m² IKJ/m² IKJ/m² IKJ/m² THERMAL (1) IKJ/m² IKJ/m² IKJ/m² IKJ/m² THERMAL (1) IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² THERMAL (1) IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² THERMAL (1) IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² IKJ/m² THERMAL (1) IKJ/m² IKJ/m²	Izod Impact, notched, 23°C	80	J/m	ASTM D256
Izod Impact, notched 80*10*4 +23°C 14 IsO 180/1A IsO 180/1A Isod Impact, notched 80*10*4 -30°C 14 Isod Impact, notched, 23°C 12 Isod Impact, notched, 23°C 12 Isod Impact, notched, -30°C 12 Isod Impact, notched, -30°C 150 179/2C Isod 179/2	Izod Impact, notched, -30°C	60	J/m	ASTM D256
Izod Impact, notched 80*10*4-30°C 14 IsO 180/1A IsO 179/2C	Instrumented Dart Impact Total Energy, 23°C	9	J	ASTM D3763
Charpy Impact, notched, 23°C 12 kJ/m² ISO 179/2C Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C THERMAL (¹) Vicat Softening Temp, Rate B/50 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	Izod Impact, notched 80*10*4 +23°C	14	kJ/m²	ISO 180/1A
Charpy Impact, notched, -30°C 12 kJ/m² ISO 179/2C THERMAL (¹) Vicat Softening Temp, Rate B/50 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	Izod Impact, notched 80*10*4 -30°C	14	kJ/m²	ISO 180/1A
THERMAL (1) Vicat Softening Temp, Rate B/50 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	Charpy Impact, notched, 23°C	12	kJ/m²	ISO 179/2C
Vicat Softening Temp, Rate B/50 205 °C ASTM D1525 HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	Charpy Impact, notched, -30°C	12	kJ/m²	ISO 179/2C
HDT, 0.45 MPa, 3.2 mm, unannealed 218 °C ASTM D648 HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	THERMAL (1)			
HDT, 1.82 MPa, 3.2mm, unannealed 206 °C ASTM D648 CTE, 40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, 40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, 40°C to 150°C, flow 2.E-05 1/°C ASTM E831	Vicat Softening Temp, Rate B/50	205	°C	ASTM D1525
CTE, -40°C to 40°C, flow 1.9E-05 1/°C ASTM E831 CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	HDT, 0.45 MPa, 3.2 mm, unannealed	218	°C	ASTM D648
CTE, -40°C to 40°C, xflow 7.E-05 1/°C ASTM E831 CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	HDT, 1.82 MPa, 3.2mm, unannealed	206	°C	ASTM D648
CTE, -40°C to 150°C, flow 2.E-05 1/°C ASTM E831	CTE, -40°C to 40°C, flow	1.9E-05	1/°C	ASTM E831
•	CTE, -40°C to 40°C, xflow	7.E-05	1/°C	ASTM E831
CTE, -40°C to 150°C, xflow 9.8E-05 1/°C ASTM E831	CTE, -40°C to 150°C, flow	2.E-05	1/°C	ASTM E831
	CTE, -40°C to 150°C, xflow	9.8E-05	1/°C	ASTM E831

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PROPERTIES	TYPICAL VALUES	UNITS	TEST METHODS
CTE, -40°C to 40°C, flow	1.9E-05	1/°C	ISO 11359-2
CTE, -40°C to 40°C, xflow	7.E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, flow	1.9E-05	1/°C	ISO 11359-2
CTE, 23°C to 80°C, xflow	8.E-05	1/°C	ISO 11359-2
Ball Pressure Test, 125°C +/- 2°C	Pass	-	IEC 60695-10-2
PHYSICAL (1)			
Specific Gravity	1.6	-	ASTM D792
Mold Shrinkage on Tensile Bar, flow ⁽²⁾	0.1 - 0.4	%	SABIC method
Mold Shrinkage, flow, 3.2 mm ⁽²⁾	0.1 - 0.4	%	SABIC method
Mold Shrinkage on Tensile Bar, xflow ⁽²⁾	0.4 - 0.8	%	SABIC method
Mold Shrinkage, xflow, 3.2 mm (2)	0.4 - 0.8	%	SABIC method
Melt Flow Rate, 250°C/5.0 kgf	24	g/10 min	ASTM D1238
Density	1.61	g/cm³	ISO 1183
Water Absorption, (23°C/saturated)	0.23	%	ISO 62-1
Moisture Absorption (23°C / 50% RH)	0.06	%	ISO 62
Melt Volume Rate, MVR at 250°C/5.0 kg	18	cm³/10 min	ISO 1133
Melt Volume Rate, MVR at 265°C/5.0 kg	20	cm³/10 min	ISO 1133
INJECTION MOLDING (3)			
Drying Temperature	110 – 120	°C	
Drying Time	2 – 4	Hrs	
Maximum Moisture Content	0.02	%	
Melt Temperature	245 – 260	°C	
Nozzle Temperature	230 – 255	°C	
Front - Zone 3 Temperature	240 – 260	°C	
Middle - Zone 2 Temperature	235 – 250	°C	
Rear - Zone 1 Temperature	230 – 240	°C	
Hopper Temperature	40 – 60	°C	
Mold Temperature	40 – 100	°C	

- (1) The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.
- (2) Measurements made from laboratory test coupon. Actual shrinkage may vary outside of range due to differences in processing conditions, equipment, part geometry and tool design. It is recommended that mold shrinkage studies be performed with surrogate or legacy tooling prior to cutting tools for new molded article. The information stated on Technical Datasheets should be used as indicative only for material selection purposes and not be utilized as specification or used for part or tool design.
- (3) Injection Molding parameters are only mentioned as general guidelines. These may not apply or may need adjustment in specific situations such as low shot sizes, large part molding, thin wall molding and gas-assist molding.

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