TECHNICAL DATA SHEET MATERIAL

POLYCARBONATE UV RESISTANT - ANTISHOCK

Physical	Nominal Value Unit	Test Method
Density	1.20 g/cm³	ISO 1183
Apparent Density	0.66 g/cm³	ISO 60
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	3.0 g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (300°C/1.2 kg)	3.00 cm³/10min	ISO 1133
Molding Shrinkage		
Across Flow	0.60 to 0.80 %	ISO 2577
Flow	0.60 to 0.80 %	ISO 2577
Across Flow: 2.00 mm [2]	0.75 %	ISO 294-4
Flow: 2.00 mm [2]	0.70 %	ISO 294-4
Water Absorption		ISO 62
Saturation, 23°C	0.30 %	
Equilibrium, 23°C, 50% RH	0.12 %	
Mechanical	**Nominal Value Unit**	**Test Method**
Tensile Modulus (23°C)	2400 MPa	ISO 527-2/1
Tensile Stress		ISO 527-2/50
Yield, 23°C	67.0 MPa	
Break, 23°C	65.0 MPa	
Tensile Strain		ISO 527-2/50
Yield, 23°C	6.3 %	
Break, 23°C	100 %	
Nominal Tensile Strain at Break (23°C)	> 50 %	ISO 527-2/50
Tensile Creep Modulus		ISO 899-1
1 hr	2200 MPa	
1000 hr	1900 MPa	
Flexural Modulus [3] (23°C)	2400 MPa	ISO 178
Flexural Strength [3]		ISO 178
3.5% Strain, 23°C	74.0 MPa	
23°C	100 MPa	
Flexural Strain at Flexural Strength		ISO 179
23°C, 2 mm/min	7.3 %	
Films	**Nominal Value Unit**	**Test Method**
Water Vapor Transmission Rate		ISO 15106-1
23°C, 100 µm, 85% RH	15 g/m²/24 hr	
Carbon Dioxide Permeability		ISO 2556
25.4 µm	16900 cm³/m²/bar/24 hr	
100.0 µm	4300 cm³/m²/bar/24 hr	
Nitrogen Permeability		ISO 2556
25.4 µm	510 cm³/m²/bar/24 hr	
100.0 µm	130 cm³/m²/bar/24 hr	
Oxygen Permeability		ISO 2556
25.4 µm	2800 cm³/m²/bar/24 hr	
100.0 µm	700 cm³/m²/bar/24 hr	
Impact	**Nominal Value Unit**	**Test Method**
Charpy Notched Impact Strength [4, 5]		ISO 7391
-30°C, Complete Break	16 kJ/m²	
23°C, Partial Break	70 kJ/m²	
Charpy Unnotched Impact Strength		ISO 179/1eU
-60°C	No Break	
-30°C	No Break	
23°C	No Break	
Notched Izod Impact Strength [6]		ISO 180/A
-30°C, Complete Break	14 kJ/m²	
23°C, Partial Break	80 kJ/m²	
Multi-Axial Instrumented Impact Energy		ISO 6603-2
-30°C	65.0 J	
23°C	60.0 J	
Multi-Axial Instrumented Impact Peak Force		ISO 6603-2
-30°C	6500 N	
23°C	5600 N	
Hardness	**Nominal Value Unit**	**Test Method**
Ball Indentation Hardness	115 MPa	ISO 2039-1

Thermal	Nominal Value Unit	Test Method
Heat Deflection Temperature		
0.45 MPa, Unannealed	138 °C	ISO 75-2/B
1.8 MPa, Unannealed	127 °C	ISO 75-2/A
Glass Transition Temperature	145 °C	ISO 11357-2
Vicat Softening Temperature		
--	146 °C	ISO 306/B50
--	147 °C	ISO 306/B120
Ball Pressure Test (137°C)	Pass	IEC 60695-10-2
CLTE		ISO 11359-2
Flow: 23 to 55°C	0.000065 cm/cm/°C	
Transverse: 23 to 55°C	0.000065 cm/cm/°C	
Thermal Conductivity (23°C)	0.20 W/m/K	ISO 8302
Electrical	**Nominal Value Unit**	**Test Method**
Surface Resistivity	1.0E+16 ohms	IEC 60093
Volume Resistivity	1.0E+16 ohm·cm	IEC 60093
Relative Permittivity		IEC 60250
23°C, 100 Hz	3.10	
23°C, 1 MHz	3.00	
Dissipation Factor		IEC 60250
23°C, 100 Hz	0.00050	
23°C, 1 MHz	0.0090	
Comparative Tracking Index		IEC 60112
Solution A	250 V	
Solution B	100 V	
Electric Strength (23°C, 1.00 mm)	34 kV/mm	IEC 60243-1
Flammability	**Nominal Value Unit**	**Test Method**
Flame Rating - UL		UL 94
1.50 mm, CL, NC, WT	HB	
3.00 mm, WT	V-2	
6.00 mm, CL, NC, WT	V-0	
Glow Wire Flammability Index		IEC 60695-2-12
1.00 mm	850 °C	
1.50 mm	850 °C	
2.00 mm	850 °C	
3.00 mm	960 °C	
4.00 mm	960 °C	
Oxygen Index [7]	27 %	ISO 4589-2
Burning Rate (> 1.00 mm, US-FMVSS)	Passed	ISO 3795
Flash Ignition Temperature	480 °C	ASTM D1929
Needle Flame Test		
1.50 mm, Method F	60.0 sec	
1.50 mm, Method K	5.0 sec	
2.00 mm, Method K	5.0 sec	
2.00 mm, Method F	60.0 sec	
3.00 mm, Method F	120.0 sec	
3.00 mm, Method K	10.0 sec	
Self Ingnition Temperature	550 °C	ASTM D1929
UL 746	**Nominal Value Unit**	**Test Method**
RTI Str (1.50 mm)	125 °C	UL 746
RTI Imp (1.50 mm)	115 °C	UL 746
RTI Elec (1.50 mm)	125 °C	UL 746
Optical	**Nominal Value Unit**	**Test Method**
Refractive Index [8]	1.587	ISO 489
Transmittance		ISO 13468-2
1.00 µm	89.0 %	
2000 µm	88.0 %	
3000 µm	88.0 %	
4000 µm	87.0 %	
Haze (3000 µm)	< 0.80 %	ISO 14782
Additional Information	**Nominal Value Unit**	**Test Method**
Electrolytical Corrosion	A1	IEC 60426
ISO Shortname	PC,ELS,(..)-05-9	ISO 7391

POLYCARBONATE FLAME RETARDANT V0

Physical	Nominal Value Unit	Test Method
Density	1,25 g/cm³	ISO 1183
Melt Volume-Flow Rate (MVR)		ISO 1133
300°C/1,2 kg	3,00 cm³/10min	
300°C/2.16 kg	5.50 cm³/10min	
Molding Shrinkage - Flow [2]	0,40 to 0,60 %	Internal Method
Water Absorption		ISO 62
Saturation, 23°C	0,32 %	
Equilibrium, 23°C, 50% RH	0,13 %	
Mechanical	**Nominal Value Unit**	**Test Method**
Tensile Modulus	2350 MPa	ISO 527-2/1
Tensile Stress		ISO 527-2/50
Yield	65,0 MPa	
Break	70,0 MPa	
Tensile Strain		ISO 527-2/50
Yield	7,0 %	
Break	> 70 %	
Flexural Modulus [3]	2350 MPa	ISO 178
Flexural Strength [3, 4]	95,0 MPa	ISO 178
Taber Abrasion Resistance		Internal Method
1000 Cycles, 1000 g, CS-17 Wheel	9,00 mg	
Impact	**Nominal Value Unit**	**Test Method**
Charpy Notched Impact Strength [5]		ISO 179/1eA
-30°C	10 kJ/m²	
23°C	11 kJ/m²	
Charpy Unnotched Impact Strength [5]		ISO 179/1eU
-30°C	No Break	
23°C	No Break	
Notched Izod Impact Strength [6]		ISO 180/1A
-30°C	10 kJ/m²	
23°C	11 kJ/m²	
Unnotched Izod Impact Strength [6]		ISO 180/1U
-30°C	No Break	
23°C	No Break	
Hardness	**Nominal Value Unit**	**Test Method**
Ball Indentation Hardness (H 358/30)	95,0 MPa	ISO 2039-1
Thermal	**Nominal Value Unit**	**Test Method**
Heat Deflection Temperature [7]		
0.45 MPa, Unannealed, 100 mm Span	148 °C	ISO 75-2/Be
1,8 MPa, Unannealed, 100 mm Span	135 °C	ISO 75-2/Ae
Vicat Softening Temperature		
–	155 °C	ISO 306/B50
–	156 °C	ISO 306/B120
Ball Pressure Test (125°C)	Pass	IEC 60695-10-2
CLTE - Flow (23 to 80°C)	0.000070 cm/cm/°C	ISO 11359-2
Thermal Conductivity	0,20 W/m/K	ISO 8302
Electrical	**Nominal Value Unit**	**Test Method**
Surface Resistivity	> 1,0E+15 ohms	IEC 60093
Volume Resistivity	> 1,0E+15 ohm·cm	IEC 60093
Relative Permittivity		IEC 60250
50 Hz	2,70	
60 Hz	2,70	
1 MHz	2,70	
Dissipation Factor		IEC 60250
50 Hz	0,0010	
60 Hz	0,0010	
1 MHz	0,010	
Electric Strength (3,20 mm, in Oil)	17 kV/mm	IEC 60243-1

Flammability		Nominal Value Unit	Test Method
Flame Rating - UL (1.50 mm)		V-0	UL 94
Glow Wire Flammability Index (1.00 mm)	• •	850 960 °C	IEC 60695-2-12

Optical	Nominal Value Unit	Test Method
Refractive Index	1.586	ISO 489
Transmittance (2540 µm)	88.0 %	ASTM D1003
Haze (2540 µm)	< 0.80 %	ASTM D1003

Extrusion	Nominal Value Unit
Drying Temperature	120 °C
Drying Time	2.0 to 4.0 hr
Hopper Temperature	100 to 120 °C
Cylinder Zone 1 Temp.	260 to 300 °C
Cylinder Zone 2 Temp.	260 to 290 °C
Cylinder Zone 3 Temp.	260 to 290 °C
Adapter Temperature	240 to 280 °C
Melt Temperature	260 to 300 °C
Die Temperature	240 to 300 °C
Calibration Temp, First	50.0 to 100 °C

Notes

[1] Typical properties: these are not to be construed as specifications.

[2] Tensile Bar

[3] 2.0 mm/min

[4] Yield

[5] 80*10*3 sp=62mm

[6] 80*10*3

[7] 120*10*4 mm

PMMA CLEAR

Physical	Nominal Value Unit	Test Method
Density	1.18 g/cm³	ISO 1183
Melt Mass-Flow Rate (MFR)	2.2 g/10 min	ISO 1133
Molding Shrinkage	0,40 to 0,70 %	ISO 294-4
Water Absorption (Equilibrium, 23°C, 50% RH)	0,30 %	ISO 62
Mechanical	**Nominal Value Unit**	**Test Method**
Tensile Stress (Yield)	83,0 MPa	ISO 527-2
Tensile Strain (Yield)	5.0 %	ISO 527-2
Flexural Modulus	3200 MPa	ISO 178
Flexural Strength	115 MPa	ISO 178
Impact	**Nominal Value Unit**	**Test Method**
Charpy Notched Impact Strength	2,0 kJ/m²	ISO 179/1eA
Charpy Unnotched Impact Strength	20 kJ/m²	ISO 179/1eU
Notched Izod Impact Strength	2.0 kJ/m²	ISO 180/1A
Hardness	**Nominal Value Unit**	**Test Method**
Rockwell Hardness (M-Scale)	98	ISO 2039-2
Ball Indentation Hardness (H 961/30)	185 MPa	ISO 2039-1
Thermal	**Nominal Value Unit**	**Test Method**
Heat Deflection Temperature		
0,45 MPa, Unannealed	105 °C	ISO 75-2/B
1,8 MPa, Unannealed	102 °C	ISO 75-2/A
Vicat Softening Temperature		
–	117 °C	ISO 306/A
–	109 °C	ISO 306/B
CLTE - Flow	0,000071 cm/cm/°C	ASTM E831
Flammability	**Nominal Value Unit**	**Test Method**
Flame Rating - UL	HB	UL 94
Glow Wire Flammability Index	650 °C	IEC 60695-2-12
Optical	**Nominal Value Unit**	**Test Method**
Refractive Index	1.490	ISO 489
Transmittance	92.0 %	ASTM D1003
Haze	0,40 %	ASTM D1003

PMMA SATIN

Physical	Nominal Value Unit	Test Method
Density	1,15 g/cm³	ISO 1183
Melt Mass-Flow Rate (MFR) (230°C/3.8 kg)	0,80 g/10 min	ISO 1133
Molding Shrinkage - Flow	0,20 to 0,80 %	ASTM D955
Water Absorption (Equilibrium, 23°C, 50% RH)	0,36 %	ISO 62
Mechanical	**Nominal Value Unit**	**Test Method**
Tensile Stress (Yield, 23°C)	38,0 MPa	ISO 527-2
Tensile Strain (Break, 23°C)	40 %	ISO 527-2
Flexural Modulus (23°C)	1700 MPa	ISO 178
Flexural Strength (23°C)	62,0 MPa	ISO 178
Compressive Stress (23°C)	45,0 MPa	ISO 604
Impact	**Nominal Value Unit**	**Test Method**
Charpy Notched Impact Strength (23°C)	7,0 kJ/m²	ISO 179/2C
Charpy Unnotched Impact Strength (23°C)	60 kJ/m²	ISO 179/2U
Notched Izod Impact Strength (23°C)	6,3 kJ/m²	ISO 180/1A
Hardness	**Nominal Value Unit**	**Test Method**
Rockwell Hardness (M-Scale)	46	ASTM D785
Thermal	**Nominal Value Unit**	**Test Method**
Heat Deflection Temperature		
0.45 MPa, Unannealed	93,0 °C	ISO 75-2/B
1.8 MPa, Unannealed	88,0 °C	ISO 75-2/A
Vicat Softening Temperature	100 °C	ISO 306/B
CLTE - Flow (-30 to 23°C)	0,00010 cm/cm/°C	ASTM D696
Specific Heat	2090 J/kg/°C	
Electrical	**Nominal Value Unit**	**Test Method**
Surface Resistivity	> 1,0E+14 ohms	ASTM D257
Volume Resistivity	> 1,0E+15 ohm·cm	ASTM D257
Dielectric Strength	15 kV/mm	ASTM D149
Dielectric Constant (60 Hz)	3,90	ASTM D150
Dissipation Factor (1 MHz)	0,040	ASTM D150
Flammability	**Nominal Value Unit**	**Test Method**
Flame Rating - UL	HB	UL 94
Optical	**Nominal Value Unit**	**Test Method**
Refractive Index [2]	1,490	ISO 489
Transmittance	90,0 %	ASTM D1003
Haze	2,0 %	ASTM D1003

DISCLAIMER

The above information and data sheet have been provided by the manufacturer.
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PTH GROUP s.r.l. - Via Ticino 15 - 21043 Castiglione Olona (VA) - ITALY
Phone +39 0331 858378 - Fax +39 0331 824390 - E-mail: info@pth-group.com
Web site: www.pth-group.com