Makrolon® 6717

Covestro - Polycarbonates - *Polycarbonate*

General Information

Product Description

MVR (300°C/1.2 kg) 3.0 cm³/10 min; flame retardant; UL 94V-0/2.0 mm; high viscosity; branched; UV stabilized; easy release; injection molding - melt temperature 280 - 320°C; extrusion; available in transparent, translucent and opaque colors

General

Material Status	• Commercial: Active		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Additive	• Flame Retardant	• UV Stabilizer	
Features	• Flame Retardant • Good Mold Release	• High Viscosity • UV Stabilized	
RoHS Compliance	• RoHS Compliant		
Appearance	• Clear/Transparent • Colors Available	• Opaque • Translucent	
Processing Method	• Extrusion	• Injection Molding	
ISO Designation	• ISO 7391-PC,MFLR,(,,)-05-9		

Properties [1]

Physical	Nominal Value	Unit	Test Method
Density (73°F)	1.20	g/cm³	ISO 1183
Apparent (Bulk) Density [2]	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)	3.0	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 : 536°F, 0.0787 in [3]	0.75	%	ISO 294-4
Flow : 0.0787 in [3]	0.70	%	ISO 294-4
Water Absorption (Saturation, 73°F)	0.30	%	ISO 62
Water Absorption (Equilibrium, 73°F, 50% RH)	0.12	%	ISO 62

Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus (73°F)	348000	psi	ISO 527-1/1
Tensile Stress (Yield, 73°F)	9720	psi	ISO 527-2/50
Tensile Stress (Break, 73°F)	9430	psi	ISO 527-2/50
Tensile Strain (Yield, 73°F)	6.4	%	ISO 527-2/50
Tensile Strain (Break, 73°F)	110	%	ISO 527-2/50
Nominal Tensile Strain at Break (73°F)	> 50	%	ISO 527-2/50
Flexural Modulus [4] (73°F)	348000	psi	ISO 178
Flexural Stress [4]			ISO 178
73°F	14200	psi	
3.5% Strain, 73°F	10900	psi	
Flexural Strain at Flexural Strength [5] (73°F)	7.1	%	ISO 178

Films	Nominal Value	Unit	Test Method
Water Vapor Transmission Rate (73°F, 85% RH, 3.9 mil)	0.97	g/100 in²/24 hr	ISO 15106-1
Carbon Dioxide Permeability (73°F, 1.0 mil)	16900	cm³/m²/bar/24 hr	ISO 2556
Gas Permeation			ISO 2556
Carbon Dioxide : 3.9 mil	3800	cm³/m²/bar/24 hr	
Nitrogen : 1.0 mil	510	cm³/m²/bar/24 hr	

	Nominal Value	Unit	Test Method
Nitrogen : 3.9 mil	120	cm³/m²/bar/24 hr	
Oxygen : 1.0 mil	2760	cm³/m²/bar/24 hr	
Oxygen : 3.9 mil	650	cm³/m²/bar/24 hr	
Impact	**Nominal Value**	**Unit**	**Test Method**
Charpy Notched Impact Strength [6]			ISO 179/1eA
-22°F, Complete Break	6.7	ft·lb/in²	
73°F, Partial Break	33	ft·lb/in²	
Charpy Unnotched Impact Strength			ISO 179/1eU
-76°F	No Break		
-22°F	No Break		
73°F	No Break		
Notched Izod Impact Strength [6]			ISO 180/A
-22°F, Complete Break	7.1	ft·lb/in²	
73°F, Partial Break	29	ft·lb/in²	
Multi-Axial Instrumented Impact Energy			ISO 6603-2
-22°F	47.9	ft·lb	
73°F	44.3	ft·lb	
Multi-Axial Instrumented Impact Peak Force			ISO 6603-2
-22°F	1440	lbf	
73°F	1240	lbf	
Hardness	**Nominal Value**	**Unit**	**Test Method**
Ball Indentation Hardness	16700	psi	ISO 2039-1
Thermal	**Nominal Value**	**Unit**	**Test Method**
Deflection Temperature Under Load (66 psi, Unannealed)	282	°F	ISO 75-2/B
Deflection Temperature Under Load (264 psi, Unannealed)	261	°F	ISO 75-2/A
Glass Transition Temperature [7]	295	°F	ISO 11357-2
Vicat Softening Temperature			
--	297	°F	ISO 306/B120
--	295	°F	ISO 306/B50
Ball Pressure Test (282°F)	Pass		IEC 60695-10-2
CLTE - Flow (73 to 131°F)	3.9E-5	in/in/°F	ISO 11359-2
CLTE - Transverse (73 to 131°F)	3.9E-5	in/in/°F	ISO 11359-2
Thermal Conductivity [8] (73°F)	1.4	Btu·in/hr/ft²/°F	ISO 8302
RTI Elec (0.08 in)	257	°F	UL 746B
RTI Imp (0.08 in)	239	°F	UL 746B
RTI Str (0.08 in)	257	°F	UL 746B
Electrical	**Nominal Value**	**Unit**	**Test Method**
Surface Resistivity	1.0E+16	ohms	IEC 60093
Volume Resistivity (73°F)	1.0E+16	ohms·cm	IEC 60093
Electric Strength (73°F, 0.0394 in)	860	V/mil	IEC 60243-1
Relative Permittivity			IEC 60250
73°F, 100 Hz	3.10		
73°F, 1 MHz	3.00		
Dissipation Factor			IEC 60250
73°F, 100 Hz	1.0E-3		
73°F, 1 MHz	9.0E-3		
Comparative Tracking Index			IEC 60112
Solution A	225	V	
Solution B	125	V	
Flammability	**Nominal Value**	**Unit**	**Test Method**
Flame Rating (0.08 in)	V-0		UL 94
Glow Wire Flammability Index			IEC 60695-2-12
0.030 in	1760	°F	
0.06 in	1760	°F	
0.12 in	1760	°F	
Glow Wire Ignition Temperature			IEC 60695-2-13
	1610	°F	
	1650	°F	
	1650	°F	
x [9]	43	%	ISO

Property	Nominal Value	Unit	Test Method
Application of Flame from Small Burner [10] (78.7 mil)	K1, F1		DIN 53438-1, -3
Burning Rate [11] (> 39.4 mil)	passed		ISO 3795
Flash Ignition Temperature	842	°F	ASTM D1929
Needle Flame Test			IEC 60695-11-5
59.1 mil [12]	120	sec	
59.1 mil [13]	120	sec	
78.7 mil [12]	120	sec	
78.7 mil [13]	120	sec	
0.12 in [12]	120	sec	
0.12 in [13]	120	sec	
Self Ignition Temperature	950	°F	ASTM D1929
Smoke Density			
with flame, CO [14]	200	ppm	AITM 3.0005
with flame, Ds 4 min	< 200		ASTM E662
with flame, HCL [14]	< 1.0	ppm	AITM 3.0005
with flame, HCN [14]	not detectable	ppm	AITM 3.0005
with flame, HF [14]	< 5.0	ppm	AITM 3.0005
with flame, NO-NO2 [14]	< 5.0	ppm	AITM 3.0005
with flame, SO2-H2O [14]	< 20	ppm	AITM 3.0005
Vertical Bunsen Burner Test			
39.4 mil [15]	passed		FAR 25.853(a)
39.4 mil [16]	passed		FAR 25.853(b)
0.12 in [16]	passed		FAR 25.853(b)
0.12 in [15]	passed		FAR 25.853(a)

Optical	Nominal Value	Unit	Test Method
Refractive Index [17]	1.586		ISO 489
Light Transmittance			ISO 13468-2
39.37 mil	87.0	%	
78.74 mil	86.0	%	
118.1 mil	85.0	%	
157.5 mil	84.0	%	

Processing Information

Injection	Nominal Value	Unit
Drying Temperature - Dry Air Dryer	248	°F
Drying Time - Dry Air Dryer	2.0 to 3.0	hr
Suggested Max Moisture	< 0.020	%
Suggested Shot Size	30 to 70	%
Rear Temperature	482 to 500	°F
Middle Temperature	518 to 536	°F
Front Temperature	536 to 554	°F
Nozzle Temperature	554 to 572	°F
Processing (Melt) Temp	536 to 608	°F
Mold Temperature	176 to 248	°F
Back Pressure	725 to 2180	psi
Vent Depth	9.8E-4 to 3.0E-3	in

Injection Notes

Standard Melt Temperature: 300°C
Hold Pressure (% of Injection Pressure): 50 - 75%
Peripheral Screw Speed: 0.05 - 0.2 m/s

Notes

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

[2] Pellets

[3] 60x60x2mm, 500 bar

8 Across Flow

9 Procedure A

10 Method K and F

11 US-FMVSS

12 Method F

13 Method K

14 BSS 7239

15 60 sec

16 12 sec

17 Method A