

CALIBRE™ 621-2

Polycarbonate Resin

Overview

CALIBRE™ 621-2 branched polycarbonate resin is specifically designed for large extrusion blow molded or injection-stretch blow molded water bottles. Specific rheological behaviour has been engineered into CALIBRE™ 621-2 to provide excellent processability during blow molding operations. The excellent processability, practical toughness, exceptional optics, and food compliance properties of CALIBRE™ 621-2 enable a host of successful applications. CALIBRE™ 621-2 is blue tinted.

Govt. and Industry Standards:

- Europe Commission Regulation (EU) No 10/2011
- U.S. FDA 21 CFR 177.1580 (with Restrictions)

Applications:

- Blow Molded Water Bottles
- Appliance industry

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	1.20 g/cm ³	1.20 g/cm ³	ASTM D792 ISO 1183
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	2.5 g/10 min	2.5 g/10 min	ASTM D1238 ISO 1133
Molding Shrinkage - Flow	5.0E-3 to 7.0E-3 in/in	0.50 to 0.70 %	ISO 294-4
Water Absorption			ISO 62
Saturation, 73°F (23°C)	0.32 %	0.32 %	
Equilibrium, 73°F (23°C), 50% RH	0.12 %	0.12 %	
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-- ¹	334000 psi	2300 MPa	ASTM D638
--	334000 psi	2300 MPa	ISO 527-1/1
Tensile Strength			
Yield ²	9140 psi	63.0 MPa	ASTM D638
Yield	9140 psi	63.0 MPa	ISO 527-2/50
Break ²	9430 psi	65.0 MPa	ASTM D638
Break	9430 psi	65.0 MPa	ISO 527-2/50
Tensile Elongation			
Yield ²	6.0 %	6.0 %	ASTM D638
Yield	6.0 %	6.0 %	ISO 527-2/50
Break ²	120 %	120 %	ASTM D638
Break	120 %	120 %	ISO 527-2/50
Flexural Modulus			
--	350000 psi	2410 MPa	ASTM D790
-- ³	348000 psi	2400 MPa	ISO 178
Flexural Strength			
--	14000 psi	96.5 MPa	ASTM D790
-- ³	14100 psi	97.0 MPa	ISO 178

Impact	Nominal Value (English)	Nominal Value (SI)	Test Method
Charpy Notched Impact Strength			ISO 179/1eA
-22°F (-30°C)	6.7 ft-lb/in ²	14 kJ/m ²	
73°F (23°C)	36 ft-lb/in ²	75 kJ/m ²	
Notched Izod Impact			
73°F (23°C)	16 ft-lb/in	850 J/m	ASTM D256
73°F (23°C)	33 ft-lb/in ²	70 kJ/m ²	ISO 180/1A
Hardness	Nominal Value (English)	Nominal Value (SI)	Test Method
Rockwell Hardness			ASTM D785
M-Scale	73	73	
R-Scale	118	118	
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Deflection Temperature Under Load			
66 psi (0.45 MPa), Annealed	295 °F	146 °C	ASTM D648 ISO 75-2/B
264 psi (1.8 MPa), Unannealed	262 °F	128 °C	ASTM D648
264 psi (1.8 MPa), Unannealed	261 °F	127 °C	ISO 75-2/A
264 psi (1.8 MPa), Annealed	289 °F	143 °C	ASTM D648 ISO 75-2/A
Vicat Softening Temperature	309 °F	154 °C	ISO 306/B50 ASTM D1525 ⁴
CLTE - Flow (-40 to 176°F (-40 to 80°C))	3.8E-5 in/in/°F	6.8E-5 cm/cm/°C	ISO 11359-2
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Dielectric Strength	430 V/mil	17 kV/mm	ASTM D149
Dissipation Factor			ASTM D150
50 Hz	1.0E-3	1.0E-3	
1 MHz	2.0E-3	2.0E-3	
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Oxygen Index ⁵	26 %	26 %	ISO 4589-2
Optical	Nominal Value (English)	Nominal Value (SI)	Test Method
Refractive Index	1.586	1.586	ISO 489
Light Transmittance	87.0 to 91.0 %	87.0 to 91.0 %	ASTM D1003
Haze	< 1.00 %	< 1.00 %	ASTM D1003
Injection	Nominal Value (English)	Nominal Value (SI)	
Drying Temperature	248 °F	120 °C	
Drying Time	4.0 hr	4.0 hr	

Extrusion Notes

Screw Diameter: 70 to 100 mm
 Die Diameter: 90 to 100 mm
 Extruder Temperature: 250 to 270°C
 Accumulator Temperature: 245 to 255°C
 Die Temperature: 245 to 255°C
 Mould Temperature, Bottom: 65 to 80°C
 Mould Temperature, Body: 65 to 80°C
 Mould Temperature, Neck: 55 to 65°C
 Screw Speed: 10 to 60 rpm
 Parison Length: 600 to 700 mm
 Gross Weight: 940 to 1400 g
 Pressure of Support Air: 0.5 to 1 bar
 Blowing Pressure: 6 to 10 bar
 Blowing Time: 25 to 35 sec
 Cycle Time: 40 to 60 sec
 Production Capacity: 60 to 80 parts/h

The above figures are intended for guidance. The optimum conditions need to be determined experimentally on the particular machine.