

# CALIBRE™ 200-23

## Polycarbonate Resin

### Overview

CALIBRE™ 200-23 polycarbonate resins are produced in compliance with the US Food and Drug Administration (FDA) and EU food contact regulations. They provide excellent impact resistance, heat distortion resistance and optical clarity. The CALIBRE 200-23 series products are available in 4 additive packages: CALIBRE 200: No mold release or UV Stabilizer. CALIBRE 201: Mold release. CALIBRE 202: UV stabilizer. CALIBRE 203: Mold release and UV stabilizer. (Note that CALIBRE 202 and 203 grades are not available in Europe and do not comply with EU food contact regulations).

Govt. and Industry Standards:

- U.S. FDA 21 CFR 177.1580
- CSA
- Underwriters Laboratory (UL)
- EU food contact 2011/10/EC

Consult the regulation for complete details.

Applications

- Food processors
- Beverage containers
- Food utensils
- Other packaging applications

Automotive Specifications

- FORD ESF-M4D100-A1

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	1.20 g/cm <sup>3</sup>	1.20 g/cm <sup>3</sup>	ASTM D792 ISO 1183/A
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	23 g/10 min	23 g/10 min	ASTM D1238 ISO 1133
Molding Shrinkage - Flow	5.0E-3 to 7.0E-3 in/in	0.50 to 0.70 %	ASTM D955 ISO 294-4
Water Absorption			ASTM D570 ISO 62
24 hr, 73°F (23°C)	0.15 %	0.15 %	
Equilibrium, 73°F (23°C), 50% RH	0.32 %	0.32 %	
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-- <sup>1</sup>	340000 psi	2340 MPa	ASTM D638
--	334000 psi	2300 MPa	ISO 527-2/50
Tensile Strength			
Yield <sup>1</sup>	8700 psi	60.0 MPa	ASTM D638
Yield	8700 psi	60.0 MPa	ISO 527-2/50
Break <sup>1</sup>	9500 psi	65.5 MPa	ASTM D638
Break	9570 psi	66.0 MPa	ISO 527-2/50
Tensile Elongation			
Break <sup>1</sup>	120 %	120 %	ASTM D638
Break	120 %	120 %	ISO 527-2/50
Flexural Modulus			
-- <sup>2</sup>	350000 psi	2410 MPa	ASTM D790
-- <sup>3</sup>	348000 psi	2400 MPa	ISO 178

<b>Mechanical</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Flexural Strength			
-- <sup>2</sup>	14000 psi	96.5 MPa	ASTM D790
-- <sup>3</sup>	14100 psi	97.0 MPa	ISO 178
Taber Abrasion Resistance	45 %	45 %	ASTM D1044
<b>Impact</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Notched Izod Impact			
73°F (23°C)	14 ft-lb/in	750 J/m	ASTM D256
73°F (23°C)	35 ft-lb/in <sup>2</sup>	74 kJ/m <sup>2</sup>	ISO 180/A
Unnotched Izod Impact (73°F (23°C))	No Break	No Break	ASTM D256 ISO 180
Instrumented Dart Impact <sup>4</sup>			ASTM D3763
73°F (23°C), Total Energy	640 in-lb	72.3 J	
Tensile Impact Strength	180 ft-lb/in <sup>2</sup>	378 kJ/m <sup>2</sup>	ASTM D1822
<b>Hardness</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Rockwell Hardness			ASTM D785
M-Scale	72	72	
R-Scale	118	118	
<b>Thermal</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Heat Deflection Temperature			
66 psi (0.45 MPa), Unannealed	282 °F	139 °C	ISO 75-2/B
66 psi (0.45 MPa), Annealed	288 °F	142 °C	ASTM D648 ISO 75-2/B
264 psi (1.8 MPa), Unannealed	258 °F	126 °C	ASTM D648
264 psi (1.8 MPa), Annealed	282 °F	139 °C	ASTM D648
264 psi (1.8 MPa), Annealed	259 °F	126 °C	ISO 75-2/A
Vicat Softening Temperature	297 °F	147 °C	ISO 306/B50 ASTM D1525 <sup>5</sup>
Ball Indentation Temperature	257 °F	125 °C	IEC 60335-1
CLTE - Flow (-40 to 180°F (-40 to 82°C))	3.8E-5 in/in/°F	6.8E-5 cm/cm/°C	ASTM D696
<b>Electrical</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Volume Resistivity	2.0E+17 ohms-cm	2.0E+17 ohms-cm	ASTM D257
Dielectric Strength			
--	420 V/mil	17 kV/mm	ASTM D149
--	430 V/mil	17 kV/mm	IEC 60243-1
Dielectric Constant			ASTM D150
60 Hz	3.00	3.00	
1 MHz	3.00	3.00	
Dissipation Factor			ASTM D150
50 Hz	1.0E-3	1.0E-3	
1 MHz	2.0E-3	2.0E-3	
Comparative Tracking Index			IEC 60112
0.0787 in (2.00 mm), Solution A	250 V	250 V	
<b>Flammability</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Flame Rating <sup>6</sup>			UL 94
0.06 in (1.6 mm)	HB	HB	
0.13 in (3.2 mm)	HB	HB	
Oxygen Index <sup>6</sup>	26 %	26 %	ISO 4589-2
Average Extent of Burning	1 in	3 cm	ASTM D635

<b>Optical</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Refractive Index	1.586	1.586	ASTM D542 ISO 489
Transmittance	89.0 %	89.0 %	ASTM D1003
Haze	1.00 %	1.00 %	ASTM D1003