

CALIBRE™ 200-23

Polycarbonate Resin

Trinseo

Message:

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 2002/72/EC

Consult the regulation for complete details.

Applications

Food processors

Beverage containers

Food utensils

Other packaging applications

General Information			
UL YellowCard	E54680-469960	E157291-238219	E206114-228275
Features	Food Contact Acceptable		
	High Clarity		
	High Impact Resistance		
Uses	Appliances		
	Containers		
	Kitchenware		
	Packaging		
Agency Ratings	CSA Unspecified Rating		
	EU 2002/72/EC		
	FDA 21 CFR 177.1580		
Forms	Pellets		
Processing Method	Injection Molding		
Multi-Point Data	Viscosity vs. Shear Rate (ASTM D3835)		
Physical	Nominal Value	Unit	Test Method
Specific Gravity	--	g/cm ³	ASTM D792, ISO 1183/A
	1.20		
--	1200	kg/m ³	ISO 1183 ¹
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	23	g/10 min	ASTM D1238, ISO 1133
Melt volume-flow rate (300°C/1.2 kg)	18.0	cm ³ /10min	ISO 1133 ²
Molding Shrinkage - Flow	0.50 to 0.70	%	ASTM D955, ISO 294-4

Water Absorption			ASTM D570, ISO 62
23°C, 24 hr	0.15	%	
Equilibrium, 23°C, 50% RH	0.32	%	
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness			ASTM D785
M-Scale	72		
R-Scale	118		
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ³	2340	MPa	ASTM D638
--	2300	MPa	ISO 527-2/50, ISO 527-2 ⁴
Tensile Strength			
Yield ⁵	60.0	MPa	ASTM D638
Yield	60.0	MPa	ISO 527-2/50, ISO 527-2 ⁶
Break ⁷	65.5	MPa	ASTM D638
Break	66.0	MPa	ISO 527-2/50
Tensile Strain			
Yield	6.0	%	ISO 527-2 ⁸
Break ⁹	120	%	ASTM D638
Break	120	%	ISO 527-2/50
Nominal strain at break	> 50	%	ISO 527-2 ¹⁰
Flexural Modulus			
-- ¹¹	2410	MPa	ASTM D790
-- ¹²	2400	MPa	ISO 178
Flexural Strength			
-- ¹³	96.5	MPa	ASTM D790
-- ¹⁴	97.0	MPa	ISO 178
Taber Abrasion Resistance	45	%	ASTM D1044
Average Extent of Burning	3	cm	ASTM D635
Impact	Nominal Value	Unit	Test Method
Charpy notched impact strength			ISO 179/1eA ¹⁵
-30°C	11.0	kJ/m ²	
23°C	70.0	kJ/m ²	
Charpy impact strength			ISO 179/1eU ¹⁶
-30°C	No Break		
23°C	No Break		
Notched Izod Impact			
23°C	750	J/m	ASTM D256
23°C	74	kJ/m ²	ISO 180/A
Unnotched Izod Impact (23°C)	No Break		ASTM D256, ISO 180
Instrumented Dart Impact ¹⁷ (23°C, Total Energy)	72.3	J	ASTM D3763

Tensile Impact Strength	378	kJ/m ²	ASTM D1822
Thermal	Nominal Value	Unit	Test Method
Heat Deflection Temperature			
0.45 MPa, Unannealed	139	°C	ISO 75-2/B
0.45 MPa, Annealed	142	°C	ASTM D648, ISO 75-2/B
0.45 MPa	142	°C	ISO 75-2 ¹⁸
1.8 MPa, Unannealed	126	°C	ASTM D648
1.8 MPa, Annealed	139	°C	ASTM D648
1.8 MPa, Annealed	126	°C	ISO 75-2/A
1.8 MPa	128	°C	ISO 75-2 ¹⁹
Vicat Softening Temperature			
--	147	°C	ASTM D1525, ISO 306/B50 8 ²⁰
50°C/h, B (50N)	147	°C	ISO 306 ²¹
Ball Indentation Temperature	125	°C	IEC 60335-1
CLTE - Flow			
-40 to 82°C	6.8E-5	cm/cm/°C	ASTM D696
--	7.0E-5	cm/cm/°C	ISO 11359-2 ²²
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity			
--	2.0E+17	ohms·cm	ASTM D257
--	> 1.0E+13	ohms·m	IEC 60093 ²³
Dielectric Strength	17	kV/mm	ASTM D149, IEC 60243-1
Dielectric Constant			
60 Hz	3.00		ASTM D150
1 MHz	3.00		ASTM D150, IEC 60250 ²⁴
100 Hz	3.00		IEC 60250 ²⁵
Dissipation Factor			
50 Hz	1.0E-3		ASTM D150
1 MHz	2.0E-3		ASTM D150, IEC 60250 ²⁶
100 Hz	1.0E-3		IEC 60250 ²⁷
Comparative Tracking Index (2.00 mm, Solution A)	250	V	IEC 60112
Flammability	Nominal Value	Unit	Test Method
Flame Rating ²⁸			UL 94
1.59 mm	HB		
3.20 mm	HB		
Burning Behav. at 1.6mm nom. thickn. (1.60 mm, UL)	HB		ISO 1210 ²⁹
Burning Behav. at thickness h (3.20 mm, UL)	HB		ISO 1210 ³⁰
Oxygen Index ³¹	26	%	ISO 4589-2
Optical	Nominal Value	Unit	Test Method

Refractive Index	1.586		ASTM D542, ISO 489
Transmittance	89.0	%	ASTM D1003
Haze	1.0	%	ASTM D1003
NOTE			
1.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
2.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
3.	50 mm/min		
4.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
5.	50 mm/min		
6.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
7.	50 mm/min		
8.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
9.	50 mm/min		
10.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
11.	Method I (3 point load), 2.0 mm/min		
12.	2.0 mm/min		
13.	Method I (3 point load), 2.0 mm/min		
14.	2.0 mm/min		
15.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
16.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
17.	3.39 m/sec		
18.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
19.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		
20.	Rate A (50°C/h), Loading 2 (50 N)		
21.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.		

22.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
23.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
24.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
25.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
26.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
27.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
28.	This rating not intended to reflect hazards presented by this or any other material under actual fire conditions.
29.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
30.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
31.	This rating not intended to reflect hazards presented by this or any other material under actual fire conditions.

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