

# CALIBRE™ 20x-10

## Trinseo - Polycarbonate Resin

### General Information

#### Product Description

CALIBRE™ 20x-10 MFR polycarbonate resins are produced in compliance with the US Food and Drug Administration (FDA) and EU food contact regulations. This material offers excellent impact resistance, heat distortion resistance and optical clarity for injection molded processes. The CALIBRE 200-10 series products are available in 2 additive packages: CALIBRE 200: No mold release or UV Stabilizer. CALIBRE 201: Mold release. Material is transparent but can be custom colored.

#### Govt. and Industry Standards:

- Europe Commission Regulation (EU) No 10/2011
- U.S. FDA 21 CFR 177.1580 (with Restrictions)
- NSF/ANSI 51 (North America Only)
- Underwriters Laboratory, Inc. (UL)

#### Applications:

- Appliances
- Housewares
- Food Processing Housings
- Containers
- Packaging applications

#### General

Features	<ul style="list-style-type: none"> <li>• Food Contact Acceptable</li> <li>• High Clarity</li> </ul>	<ul style="list-style-type: none"> <li>• High Impact Resistance</li> <li>• Medium Flow</li> </ul>	
Uses	<ul style="list-style-type: none"> <li>• Containers</li> <li>• Food Service Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Household Goods</li> <li>• Kitchenware</li> </ul>	<ul style="list-style-type: none"> <li>• Packaging</li> <li>• Transparent Parts</li> </ul>
Agency Ratings	<ul style="list-style-type: none"> <li>• EU 2011/10/EC</li> </ul>	<ul style="list-style-type: none"> <li>• FDA 21 CFR 177.1580<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• NSF STD-51<sup>2</sup></li> </ul>
RoHS Compliance	<ul style="list-style-type: none"> <li>• RoHS Compliant</li> </ul>		
Appearance	<ul style="list-style-type: none"> <li>• Clear/Transparent</li> </ul>		
Forms	<ul style="list-style-type: none"> <li>• Pellets</li> </ul>		
Processing Method	<ul style="list-style-type: none"> <li>• Film Extrusion</li> <li>• Injection Molding</li> </ul>	<ul style="list-style-type: none"> <li>• Profile Extrusion</li> <li>• Sheet Extrusion</li> </ul>	<ul style="list-style-type: none"> <li>• Thermoforming</li> </ul>

### Properties<sup>3</sup>

Physical	Nominal Value	Unit	Test Method
Density / Specific Gravity	1.20		ASTM D792
Density	1.20	g/cm <sup>3</sup>	ISO 1183
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	10	g/10 min	ASTM D1238
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	10	g/10 min	ISO 1133
Molding Shrinkage - Flow	0.50 to 0.70	%	ISO 294-4
Water Absorption (Saturation, 73°F)	0.32	%	ISO 62
Water Absorption (Equilibrium, 73°F, 50% RH)	0.12	%	ISO 62
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus <sup>4</sup>	334000	psi	ASTM D638
Tensile Modulus	334000	psi	ISO 527-1/1
Tensile Strength <sup>5</sup> (Yield)	8700	psi	ASTM D638
Tensile Stress (Yield)	8700	psi	ISO 527-2/50
Tensile Strength <sup>5</sup> (Break)	10300	psi	ASTM D638

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Mechanical	Nominal Value	Unit	Test Method
Tensile Stress (Break)	10300	psi	ISO 527-2/50
Tensile Elongation <sup>5</sup> (Yield)	6.0	%	ASTM D638
Tensile Strain (Yield)	6.0	%	ISO 527-2/50
Tensile Elongation <sup>5</sup> (Break)	130	%	ASTM D638
Tensile Strain (Break)	140	%	ISO 527-2/50
Flexural Modulus	350000	psi	ASTM D790
Flexural Modulus <sup>6</sup>	348000	psi	ISO 178
Flexural Strength	14000	psi	ASTM D790
Flexural Stress <sup>6</sup>	14100	psi	ISO 178
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			ISO 179/1eA
-22°F	6.2	ft·lb/in <sup>2</sup>	
73°F	17	ft·lb/in <sup>2</sup>	
Notched Izod Impact (73°F)	16	ft·lb/in	ASTM D256
Notched Izod Impact Strength (73°F)	43	ft·lb/in <sup>2</sup>	ISO 180/1A
Instrumented Dart Impact <sup>7</sup> (73°F, Total Energy)	783	in·lb	ASTM D3763
Tensile Impact Strength	248	ft·lb/in <sup>2</sup>	ASTM D1822
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness			ASTM D785
M-Scale	73		
R-Scale	118		
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load (66 psi, Unannealed)	289	°F	ASTM D648
Deflection Temperature Under Load (66 psi, Annealed)	291	°F	ASTM D648
Deflection Temperature Under Load (66 psi, Annealed)	291	°F	ISO 75-2/B
Deflection Temperature Under Load			ASTM D648
264 psi, Unannealed	262	°F	
Deflection Temperature Under Load			ISO 75-2/A
264 psi, Unannealed	257	°F	
Deflection Temperature Under Load (264 psi, Annealed)	286	°F	ASTM D648
Deflection Temperature Under Load (264 psi, Annealed)	286	°F	ISO 75-2/A
Vicat Softening Temperature	300	°F	ASTM D1525 <sup>8</sup>
Vicat Softening Temperature	300	°F	ISO 306/B50
Ball Indentation Temperature	> 257	°F	IEC 60335-1
CLTE - Flow (-40 to 176°F)	3.8E-5	in/in/°F	ISO 11359-2
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity	> 1.0E+15	ohms·cm	IEC 60093
Dielectric Strength	420	V/mil	ASTM D149
Electric Strength	430	V/mil	IEC 60243-1
Relative Permittivity			IEC 60250
100 Hz	3.00		
1 MHz	3.00		
Dissipation Factor			ASTM D150
50 Hz	1.0E-3		
1 MHz	2.0E-3		
Comparative Tracking Index (0.0787 in, Solution A)	250	V	IEC 60112

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## Trinseo - Polycarbonate Resin

Flammability	Nominal Value	Unit	Test Method
Flame Rating <sup>9</sup>			UL 94
0.06 in		HB	
0.12 in		HB	
Glow Wire Flammability Index <sup>9</sup>			IEC 60695-2-12
0.04 in	1650	°F	
0.08 in	1610	°F	
0.12 in	1610	°F	
Glow Wire Ignition Temperature <sup>9</sup>			IEC 60695-2-13
0.04 in	1470	°F	
0.08 in	1430	°F	
0.12 in	1430	°F	
Oxygen Index <sup>9</sup>	26	%	ISO 4589-2
Optical	Nominal Value	Unit	Test Method
Refractive Index	1.586		ISO 489
Light Transmittance (118.1 mil)	87.0 to 91.0	%	ASTM D1003
Haze	< 1.00	%	ASTM D1003

### Processing Information

Injection	Nominal Value	Unit
Drying Temperature	248	°F
Drying Time	4.0	hr

### Notes

<sup>1</sup> With Restrictions

<sup>2</sup> North America only

<sup>3</sup> Typical properties: these are not to be construed as specifications.

<sup>4</sup> 0.039 in/min

<sup>5</sup> 2.0 in/min

<sup>6</sup> 0.079 in/min

<sup>7</sup> 10.9 ft/sec

<sup>8</sup> Rate A (50°C/h), Loading 2 (50 N)

<sup>9</sup> This rating not intended to reflect hazards presented by this or any other material under actual fire conditions.