

CALIBRE™ MEGARAD™ 2081-15

Polycarbonate Resin

Trinseo

Message:

CALIBRE™ MEGARAD 2081-15 Polycarbonate resin provides end-users of radiation sterilized medical devices a color closer to the water-clear look of the natural resin. When exposed to high energy radiation (gamma or electron beam), CALIBRE MEGARAD 2081-15 resin can reduce the color shift by 50% compared to general purpose polycarbonate resins. CALIBRE 2081-15 resin has undergone biocompatibility testing based on ISO 10993 (Biological Evaluation of Medical Devices) and is suitable for use in approved medical applications.

Main Characteristics:

Stabilized for higher engery radiation

Tested under ISO 10993

Transparent

Contains mold release

Applications:

Medical applications

General Information			
Additive	Mold Release		
Features	Biocompatible		
Uses	Electrical/Electronic Applications		
	General Purpose		
	Medical/Healthcare Applications		
Agency Ratings	ISO 10993 2		
Appearance	Clear/Transparent		
Forms	Pellets		
Processing Method	Injection Molding		
Multi-Point Data	Specific Heat vs. Temperature (ASTM D3417)		
	Specific Volume vs Temperature (ISO 11403-2)		
	Tensile Stress vs. Strain (ASTM D638)		
	Thermal Conductivity vs. Temperature (ASTM E1530)		
	Viscosity vs. Shear Rate (ASTM D3835)		
Physical	Nominal Value	Unit	Test Method
Specific Gravity			
--	1.20	g/cm³	ASTM D792, ISO 1183/A
--	1200	kg/m³	ISO 1183 ¹
Melt Mass-Flow Rate (MFR) (300°C/1.2 kg)	15	g/10 min	ASTM D1238, ISO 1133
Melt volume-flow rate (300°C/1.2 kg)	12.0	cm³/10min	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 (R-Scale)	118		ASTM D785
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
-- ³	2210	MPa	ASTM D638
--	2300	MPa	ISO 527-2/50, ISO 527-2 ⁴
Tensile Strength			
Yield ⁵	62.1	MPa	ASTM D638
Yield	62.0	MPa	ISO 527-2/50, ISO 527-2 ⁶
Break ⁷	68.3	MPa	ASTM D638
Break	68.0	MPa	ISO 527-2/50
Tensile Elongation			
Yield ⁸	6.0	%	ASTM D638
Yield	6.0	%	ISO 527-2/50, ISO 527-2 ⁹
Break ¹⁰	150	%	ASTM D638
Break	150	%	ISO 527-2/50
Nominal strain at break	> 50	%	ISO 527-2 ¹¹
Flexural Modulus			
-- ¹²	2410	MPa	ASTM D790
--	2400	MPa	ISO 178
Flexural Strength			
-- ¹³	96.5	MPa	ASTM D790
--	98.0	MPa	ISO 178
Taber Abrasion Resistance	45	%	ASTM D1044
Impact	Nominal Value	Unit	Test Method
Charpy Notched Impact Strength			
23°C	25	kJ/m ²	ISO 179/1eA
-30°C	12.0	kJ/m ²	ISO 179/1eA ¹⁴
23°C	80.0	kJ/m ²	ISO 179/1eA ¹⁵
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	75	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)	81.3	J	ASTM D3763
Tensile Impact Strength	378	kJ/m ²	ASTM D1822
Thermal	Nominal Value	Unit	Test Method
Deflection Temperature Under Load			
0.45 MPa, Annealed	139	°C	ASTM D648

0.45 MPa	137	°C	ISO 75-2 ¹⁸
1.8 MPa, Unannealed	122	°C	ASTM D648
1.8 MPa, Unannealed	120	°C	ISO 75-2/A
1.8 MPa, Annealed	136	°C	ASTM D648
1.8 MPa	123	°C	ISO 75-2 ¹⁹
Vicat Softening Temperature			
--	148	°C	ASTM D1525 ²⁰
--	143	°C	ISO 306/B50
50°C/h, B (50N)	143	°C	ISO 306 ²¹
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 3 ²⁴
Dielectric Constant			
60 Hz	3.00		ASTM D150
1 MHz	3.00		ASTM D150, IEC 60250 ²⁵
100 Hz	3.00		IEC 60250 ²⁶
Dissipation Factor			
50 Hz	1.0E-3		ASTM D150
1 MHz	2.0E-3		ASTM D150, IEC 60250 ²⁷
100 Hz	1.0E-3		IEC 60250 ²⁸
Flammability	Nominal Value	Unit	Test Method
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
Optical	Nominal Value	Unit	Test Method
Refractive Index	1.586		ASTM D542, ISO 489
Transmittance	85.0	%	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.	50 mm/min
9.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
10.	50 mm/min
11.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
12.	Method I (3 point load), 2.0 mm/min
13.	Method I (3 point load), 2.0 mm/min
14.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
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.	Tested in accordance with ISO 10350. 23°C/50%r.h. unless otherwise noted.
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.

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