

## ZEONEX® 690R Medical Grade

Cyclo-Olefin Polymer resin that is suitable for most Pharmaceutical applications. Compatible with EtO, Gamma irradiation, vaporized hydrogen peroxide and steam/autoclave sterilization.

Property	Value	Unit	Test Standard
<b>Physical Properties</b>			
Density	1.018	kg/m <sup>3</sup>	ASTM D792
Melt flow rate (MFR) (280 °C, 21.18 N)	16.9	g/10min	JIS K719, ISO 1133
Water absorption (23 °C-sat)	0.01	%	ASTM D570
Water vapor transmission (40 °C, 90% rh, @100µm thickness)	1.0	g/(m <sup>2</sup> ·day)	ASTM F1249
Oxygen transmission (23 °C, 0% rh, @100µm thickness)	346.5	cm <sup>3</sup> / (m <sup>2</sup> ·day·atm)	ASTM D3985
<b>Mechanical Properties</b>			
Tensile modulus (1 mm/min)	355	kpsi	ISO 527
Tensile stress at yield (5 mm/min)	9185	psi	ISO 527
Tensile stress at break (5 mm/min)	6937	psi	ISO 527
Tensile stress (5 mm/min)	9185	psi	ISO 527
Tensile strain at break (5 mm/min)	61	%	ISO 527
Flexural modulus	331	kpsi	ISO 178
Flexural strength	14649	psi	ISO 178
Charpy impact strength @ 23 °C	61.9	ft-lbs/in <sup>2</sup>	ISO 179 / 1eU
Charpy impact strength @ -20 °C	61.9	ft-lbs/in <sup>2</sup>	ISO 179 / 1eU
Charpy impact strength @ -80 °C	47.6	ft-lbs/in <sup>2</sup>	ISO 179 / 1eU
Charpy impact strength @ -194 °C	29.5	ft-lbs/in <sup>2</sup>	ISO 179 / 1eU
<b>Thermal Properties</b>			
Glass transition temperature (20 °C/min)	136.0	°C	JIS K7121
DTUL @ 1.82 MPa	119.7	°C	ASTM D648
Flammability @ 0.75 mm nom. thickn.	HB	UL94	HB
<b>Electrical Properties</b>			
Dielectric contant at 1 GHz	2.30	-	IEC 62810
Volume resistivity	3.39E+16	Ω·m	IEC 62631-3-1
<b>Optical Properties</b>			
Deg. of light transmission (t = 3mm)	91.5	%	ASTM D1003

Typical properties. Not to be used for purposes of establishing specification(s).

COP medical grades (**ZEONEX®5000, ZEONEX®690R, ZEONEX®790R, ZEONOR®1020R**) have been assessed for compliance with USP Class VI <87>, <88> and <661.1> , ISO10993, EU 3.1.3 and 3.1.5, and JP 7.02. FDA DMF and more information available upon request.

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