

GUR® 4120

Ultra High Molecular Weight Polyethylene

Celanese Corporation

Message:

GUR 4120 UHMW-PE is a linear polyolefin resin in powder form with a molecular weight of approximately 5.0 MM g.mol calculated using Margolies' equation. The extremely high molecular weight of this resin yields several unique properties including superior abrasion resistance and highest impact strength of all standard grades. Outstanding properties include a low coefficient of friction that results in self-lubricating, non-stick surfaces after processing. The resin is normally processed by compression molding, ram extrusion or free sintering of porous parts.

General Information			
UL YellowCard	E223637-101046348		
Features	Good Abrasion Resistance		
	High Impact Resistance		
	Low Friction		
	Self Lubricating		
	Ultra High Molecular Weight		
RoHS Compliance	Contact Manufacturer		
Forms	Powder		
Processing Method	Compression Molding		
	Extrusion		
Multi-Point Data	Isochronous Stress vs. Strain (ISO 11403-1)		
	Shear Modulus vs. Temperature (ISO 11403-1)		
Physical	Nominal Value	Unit	Test Method
Specific Gravity			
--	0.928	g/cm ³	ASTM D792
--	0.930	g/cm ³	ISO 1183
Melt Mass-Flow Rate (MFR) (190°C/21.6 kg)	< 0.10	g/10 min	ASTM D1238, ISO 1133
Water Absorption			ISO 62
Saturation, 23°C	< 0.010	%	
Equilibrium, 23°C, 50% RH	< 0.010	%	
Viscosity Number	2400	cm ³ /g	ISO 307
Elongational Stress F - 150/10	0.220	MPa	ISO 1152-2
Intrinsic Viscosity	21	dl/g	ISO 1628-3
Abrasion Loss	100		Internal Method
Wear by Sandslurry Method ¹	100		Internal Method
Charpy Impact Strength ²	210	kJ/m ²	ISO 1152-2
Hardness	Nominal Value	Unit	Test Method

Durometer Hardness			
Shore D	63		ASTM D2240
Shore D, 15 sec	60		ISO 868
Ball Indentation Hardness ³	36.0	MPa	ISO 2039-1
Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
23°C	703	MPa	ASTM D638
--	720	MPa	ISO 527-2/1A/1
Tensile Strength			
Yield, 23°C	21.4	MPa	ASTM D638
Yield	17.0	MPa	ISO 527-2/1A/50
Tensile Strain (Yield)	20	%	ISO 527-2/1A/50
Nominal Tensile Strain at Break	> 50	%	ISO 527-2/1A/50
Tensile Creep Modulus			
1 hr	460	MPa	
1000 hr	230	MPa	
Coefficient of Friction (vs. Steel - Dynamic)	0.10		Internal Method
Thermal	Nominal Value	Unit	Test Method
Heat Deflection Temperature			
0.45 MPa, Unannealed	65.0	°C	ISO 75-2/B
1.8 MPa, Unannealed	42.0	°C	ISO 75-2/A
Vicat Softening Temperature	80.0	°C	ASTM D1525, ISO 306/B50
CLTE - Flow	2.0E-4	cm/cm/°C	ASTM D696, ISO 11359-2
Specific Heat			
--	1840	J/kg/°C	
23°C	1840	J/kg/°C	
Thermal Conductivity (23°C)	0.41	W/m/K	Internal Method
Electrical	Nominal Value	Unit	Test Method
Surface Resistivity			
--	> 1.0E+13	ohms	ASTM D257
--	> 1.0E+12	ohms	IEC 60093
Volume Resistivity			
--	> 1.0E+15	ohms · cm	ASTM D257
--	> 1.0E+14	ohms · cm	IEC 60093
Electric Strength	45	kV/mm	IEC 60243-1
Dielectric Constant			
1 MHz	3.00		ASTM D150, IEC 60250
100 Hz	2.10		IEC 60250
Dissipation Factor			
100 Hz	3.9E-4		IEC 60250
1 MHz	1.0E-3		
Comparative Tracking Index	600	V	IEC 60112

Flammability	Nominal Value	Unit	Test Method
Flame Rating (1.60 mm)	HB		UL 94
NOTE			
1.	Based on GUR 4120=100		
2.	14° V-notch both sides		
3.	30 sec		

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