

GUR® 4152

Ultra High Molecular Weight Polyethylene

Celanese Corporation

Message:

GUR 4152 UHMW-PE is a linear polyolefin resin in powder form with a molecular weight of approximately 7.7 MM g/mol calculated using Margolies' equation. The extremely high molecular weight of this resin yields several unique properties including superior abrasion resistance and impact strength. This and GUR 4150 resins have the best abrasion resistance 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 or ram extrusion.

General Information	
Features	Good Abrasion Resistance
	Good Impact Resistance
	Low Friction
	Ultra High Molecular Weight
RoHS Compliance	Contact Manufacturer
Forms	Powder
Processing Method	Compression Molding
	Extrusion

Physical	Nominal Value	Unit	Test Method
Density	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 (Equilibrium, 23°C, 50% RH)	< 0.010	%	ISO 62
Viscosity Number	3400	cm ³ /g	ISO 307
Elongational Stress F - 150/10	0.410	MPa	ISO 1152-2
Intrinsic Viscosity	28	dl/g	ISO 1628-3
Abrasion Loss	80.0		Internal Method
Wear by Sandslurry Method ¹	80.0		Internal Method
Charpy Impact Strength ²	130	kJ/m ²	ISO 1152-2

Hardness	Nominal Value	Unit	Test Method
Durometer Hardness			
Shore D	61		ASTM D2240
Shore D, 15 sec	61		ISO 868
Ball Indentation Hardness ³	35.0	MPa	ISO 2039-1

Mechanical	Nominal Value	Unit	Test Method
Tensile Modulus			
23°C	689	MPa	ASTM D638
--	680	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
Break, 23°C	35.0	MPa	ASTM D638
Break	35.0	MPa	ISO 527-2/1A/50
Tensile Elongation			
Yield, 23°C	< 20	%	ASTM D638
Yield	20	%	ISO 527-2/1A/50
Break, 23°C	> 300	%	ASTM D638
Nominal Tensile Strain at Break	300	%	ISO 527-2/1A/50
Tensile Creep Modulus			ISO 899-1
1 hr	430	MPa	
1000 hr	220	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	ISO 11359-2
Specific Heat			Internal Method
--	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+12	ohms	IEC 60093
Volume Resistivity	> 1.0E+14	ohms·cm	IEC 60093
Electric Strength	45	kV/mm	IEC 60243-1
Relative Permittivity			IEC 60250
100 Hz	2.10		
1 MHz	3.00		
Dissipation Factor			IEC 60250
100 Hz	4.0E-4		
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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