

Technical Data

Premium Technology Grades (PE-UHMW)

Material designation		CHIRULEN® 1020	
ISO designation		PE-UHMW	
Material description		Medical Grade PE-UHMW for surgical implants acc. to ISO 5834 and ASTM F 648 compression moulded low calcium GUR 1020	
Raw material		GUR 1020	
Colour(s)		natural	
Material properties	Standard	Unit	
Average molecular weight (average molecular mass) acc. to Margolie's equation		(g/mol)	approx. $5 \cdot 10^6$
Elongational stress F(150/10)		(MPa)	≥ 0,2
Viscosity number (VN)		(ml/g)	≥ 2000
Density	ISO 1183	(kg/m ³)	927 - 944
Water absorption at 23° C until saturation	ISO 62	(%)	< 0,01
Mechanical properties	Standard	Unit	
Tensile stress at yield (tensile strength)	ISO 527	(MPa)	≥ 21
Tensile stress at break (ultimate tensile strength)	ISO 527	(MPa)	≥ 35
Elongation at break	ISO 527	(%)	≥ 300
Tensile modulus	ISO 527	(MPa)	approx. 720
Impact strength (Charpy) at 23° C	ISO 179	(kJ/m ²)	no break
Notched impact strength (Charpy) at 23° C	ISO 11542-2	(kJ/m ²)	≥ 180
Ball indentation hardness	ISO 2039-1	(N/mm ²)	30 - 35
Shore-Hardness D, 15 s value	ISO 868	(-)	60 - 65
Thermal properties	Standard	Unit	
Melting point DSC, 10 K/min	ISO 3146	(°C)	130 - 135
Vicat softening point	ISO 306	(°C)	80
Coefficient of linear thermal expansion between 23 and 80° C	ISO 11359	(K ⁻¹)	$2 \cdot 10^{-4}$
Heat deflection temperature HDT/A (1,8 MPa)	ISO 75, Teil 1/2	(°C)	42
Thermal conductivity	ISO 52612	(W/[m * K])	approx. 0,4
Electrical properties	Standard	Unit	
Relative permittivity at 100 Hz	IEC 60250	(-)	2,1
Dissipation factor at 100 Hz	IEC 60250	(-)	$3,9 \cdot 10^{-4}$
Volume resistivity	IEC 60093	(Ohm * m)	> 10^{14}
Surface resistivity	IEC 60093	(Ohm)	> 10^{15}
Dielectric strength	IEC 60243	(kV/mm)	45
Physiological properties	Standard	Unit	
Food conformances according to EU Directive 2002/72/EC			yes
FDA Regulation 21CFR177.1520			yes
FDA Regulation 21CFR178.2010			N/A
FDA Regulation 21CFR178.3297			N/A
Sterilisation	Standard	Unit	
Ethylene oxide			yes
Gas plasma			yes
Gamma (inert atmosphere)			yes
Superheated steam 121/134° C			no/no
Conformances	Standard	Unit	
USP Class VI			yes
Cytotoxicity			yes
Drug Master File - DMF	EU		10916
Drug Master File - DMF	USA		10904
Device Master File - MAF			588
ISO 5834-2			Type 1
ASTM F 648			Type 1

Notice to users:

The technical data shown in this data sheet refers to a 40 mm thick sheet. Due to the production process the data may vary depending on the material thickness.

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