



Technical Data

TIVAR® Materials

Material designation			TIVAR® 1000 BOR
ISO designation			PE-UHMW
Material description			Ultra High Molecular Weight Polyethylene with boron based additives as shielding material for the nuclear industry
Colour(s)			natural
Material properties	Standard	Unit	
Average molecular weight (average molecular mass)		(g/mol)	approx. $5 \cdot 10^6$
Density	ISO 1183	(kg/m ³)	960
Water absorption at 23° C until saturation	ISO 62	(%)	< 0,01
Mechanical properties	Standard	Unit	
Tensile stress at yield (tensile strength)	ISO 527	(MPa)	≥ 17
Elongation at break	ISO 527	(%)	≥ 200
Tensile modulus	ISO 527	(MPa)	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)	≥ 120
Ball indentation hardness	ISO 2039-1	(N/mm ²)	30 - 35
Shore-Hardness D, 15 s value	ISO 868	(-)	60 - 65
Coefficient of friction	-	(-)	approx. 0,3
Abrasion (Sand-Slurry)	-	(%)	100
Thermal properties	Standard	Unit	
Melting point DSC, 10 K/min	ISO 3146	(°C)	135 - 138
Vicat softening point	ISO 306	(°C)	80
Coefficient of linear thermal expansion between 23 and 80° C	ISO 11359	(K ⁻¹)	approx. $2 \cdot 10^{-4}$
Thermal conductivity	ISO 52612	(W/[m * K])	approx. 0,4
Use temperature (max.)	-	(°C)	80
Use temperature (briefly)	-	(°C)	90
Use temperature (min.)	-	(°C)	-200
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^{12}
Surface resistivity	IEC 60093	(Ohm)	> 10^{12}
Dielectric strength	IEC 60243	(kV/mm)	45
Physiological properties	Standard	Unit	
Food conformance according to EU Directive 2002/72/EC			no
FDA Regulation 21CFR177.1520			no
FDA Regulation 21CFR178.2010			no
FDA Regulation 21CFR178.3297			no

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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