

STEMYLEN PE-UHMW

Product data sheet

Revision date: 1.2.2017 - Version: 2.0



STEMPLAST HATZIAVGOSTIS
ENGINEERING PLASTICS

Material:	polyethylene UHMW (PE 1000)
DIN EN ISO 1043-1 ¹ Norm:	PE-UHMW polyethylene ultra high molecular weight
Product's shape:	semi-finished products

Material characteristics

Low density, high abrasion and wear resistance, almost no absorption of moisture, low coefficient of friction, very high impact loading, self lubricating properties, high dynamic stresses resistance, excellent performance capability when used at temperatures down to -200 °C, excellent resistance to stress cracks, high resistance to corrosion and chemicals.

Application examples

Gears, chain guides, scrapers, sliding surfaces, elements for food, textile, chemical, paper industries.

General properties

Density ρ	0.93 gr/cm ³	DIN EN ISO 1183-1 DIN 53479/ASTM D792 sim.
Moisture absorption		DIN EN ISO 62
saturation in air (23 °C, 50% RH)	<0.01 %	DIN 53495 sim.
saturation in water (23 °C)	<0.01 %	ASTM D570

Mechanical properties

Tensile stress at yield σ_Y	20 MPa	DIN EN ISO 527
Tensile strength σ_T		DIN 53455 sim.
Elongation at break ϵ_B	>50 %	ASTM D638
Modulus of elasticity E_t	750 MPa	
Flexural stress at yield σ_Y		DIN EN ISO 178
Flexural strength σ_b	>20 MPa	DIN 53452 sim.
Modulus of elasticity E_b	>750 MPa	ASTM D790
Compressive stress at 1/2/5% nominal strain σ_Y	4.5/8/14 MPa	DIN EN ISO 604 / ASTM D695
Compressive strength σ_c		DIN 53454/53457 sim.
Impact strength		DIN EN ISO 179/1eU
Charpy unnotched a_{CU}	nb	(DIN 53453)
Charpy notched a_{cN}	nb	DIN EN ISO 179/1eA ASTM D6110 sim.
Izod notched a_{iN}		DIN EN ISO 180/1A ASTM D256 sim.
Creep rate stress at 1% strain after 1000 h $\sigma_{1/1000}$	2 MPa	DIN EN ISO 899-1 DIN 53444/ASTM D2990 sim.
Hardness		DIN EN ISO 2039-1
ball indentation $H_{358/30}$	38	(DIN 53456)
Rockwell	M61	DIN EN ISO 2039-2 ASTM D785
Shore scale D	60	DIN EN ISO 868 (DIN 53505) ASTM D2240 sim.
Coefficient of sliding friction μ	0.29	
Wear rate S (dry running against steel, $P=0.05$ MPa, $V=0.6$ m/s, $t=60$ °C, near running surface)	0.45 $\mu\text{m}/\text{km}$	DIN ISO 7148-2 sim. Pin on disc apparatus

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Electrical properties

Dielectric constant (relative permittivity) ϵ_r		
100 Hz	2.1	IEC 60250
1 MHz	3.0	DIN 53483 sim.
Dielectric dissipation factor $\tan\delta$		VDE 0303-4
100 Hz	0.0004	ASTM D150
1 MHz	0.001	
Volume resistivity ρ	$>10^{14} \Omega \cdot \text{cm}$	IEC 60093 / VDE 0303-30
Surface resistivity σ	$>10^{13} \Omega$	DIN 53482 sim. / ASTM D257
Dielectric strength E_d	45 kV/mm	IEC 60243-1 / VDE 0303-21 DIN 53481 sim. / ASTM D149
Tracking resistance V	CTI 600	IEC 60112 / VDE 0303-11 DIN 53480 sim. ASTM D3638 / UL 746A

Thermal properties

Melting temperature T_m (DSC, 10 °C/min)	133-135 °C	ISO 11357-1,-3 ASTM D3418 sim.
Thermal conductivity λ (23 °C)	0.40 W/(m·K)	ISO 22007-2 / ISO 8302 sim. DIN 52612-2/ASTM C177 sim.
Specific heat (thermal capacity) c	1.9 J/(g·K)	ISO 11357-4 ASTM E1269/ASTM C351 sim.
Coefficient of linear thermal expansion α (average value 23-60 °C)	$180 \cdot 10^{-6} \cdot \text{K}^{-1}$	ISO 11359-2 DIN 53752/ASTM E831 sim.
Service temperature		
long term (min / max - 5000 h)	-250 / 80 °C	
short term (not under stress - few hours)	120 °C	
Vicat softening point		ISO 306
VST A50 - 10N	130 °C	DIN 53460 sim.
VST B50 - 50N	80 °C	ASTM D1525
Heat deflection temperature		DIN EN ISO 75-1,-2
HDT A - 1.80 MPa	42 °C	DIN 53461 sim.
HDT B - 0.45 MPa	62 °C	ASTM D648
Flammability according to UL94 (thickness 3 / 6 mm)	HB	
oxygen index	18 %	ISO 4589 -1,-2 ASTM D2863 sim.

The above mentioned electrical properties result from measurements on natural material.

The indicated values result from numerous individual measurements for an approximation of the values and correspond to our today's knowledge. They serve as information about our products and are presented as a guide to choose from our range of materials. This, however, does not include an assurance of specific properties or the suitability for particular application purposes that are legally binding. Since the properties also depend on the dimension of the semi-finished products and the degree of crystallisation (e.g. nucleating by pigments), the actual values of the properties of a particular product may differ from the indicated values.

¹ DIN 7728-1, January 1988 edition, has been superseded by the specifications of EN ISO 1043-1, which is identical to ISO 1043-1

nb : no break