

STEMATEC F2378.1

Product data sheet

Revision date: 1.2.2017 - Version: 2.0



STEMPLAST HATZIAVGOSTIS
ENGINEERING PLASTICS

Material:	glass epoxy resin
IEC/EN 60893-3-1 Norm:	
NEMA LI-1 Norm:	FR-4
DIN 7735 Norm:	Hgw 2378.1
Product's shape:	semi-finished products

Material characteristics

Very good mechanical properties, excellent electrical properties, low moisture absorption.

Application examples

Spools, insulating covers, vibration devices.

General properties

Density ρ	1.70-1.90 gr/cm ³	DIN EN ISO 1183-1 DIN 53479/ASTM D792 sim.
Moisture absorption (immersion in water, 50x50x3 mm, 23 °C/24h)		DIN EN ISO 62 DIN 53495 sim. ASTM D570

Mechanical properties

Tensile stress at yield σ_Y		
Tensile strength σ_T	200 MPa	DIN EN ISO 527 DIN 53455 sim.
Elongation at break ϵ_B		ASTM D638
Modulus of elasticity E_t	18000 MPa	
Flexural stress at yield σ_Y		DIN EN ISO 178
Flexural strength σ_b	300 MPa	DIN 53452 sim.
Modulus of elasticity E_b		ASTM D790
Compressive strength σ_c (parallel to layers)		DIN EN ISO 604 / ASTM D695
Compressive strength σ_c (perpendicular to layers)	150 MPa	DIN 53454/53457 sim.
Impact strength		DIN EN ISO 179
Charpy α_n 10 and α_n 15		(DIN 53453)
Charpy α_k 10		DIN EN ISO 179 (DIN 53453)
Charpy notched α_k 15		DIN EN ISO 179 (DIN 53453)
Creep rate stress at 1% strain after 1000 h $\sigma_{1/1000}$		DIN EN ISO 899-1 DIN 53444/ASTM D2990 sim.
Hardness		DIN EN ISO 2039-1
ball indentation $H_{358/30}$		(DIN 53456)
Rockwell		DIN EN ISO 2039-2 ASTM D785
Shore scale D		DIN EN ISO 868 (DIN 53505) ASTM D2240 sim.
Coefficient of sliding friction μ		
Wear rate S (dry running against steel, P=0.05 MPa, V=0.6 m/s, t=60 °C, near running surface)		DIN ISO 7148-2 sim. Pin on disc apparatus

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Electrical properties

Dielectric constant (relative permittivity) ϵ_r		
100 Hz		IEC 60250
1 MHz	3.2	DIN 53483 sim.
Dielectric dissipation factor $\tan\delta$		VDE 0303-4
100 Hz		ASTM D150
1 MHz	0.002	
Surface resistivity σ		IEC 60093 / VDE 0303-30
(immersion in water 24h)	$>10^{10} \Omega$	DIN 53482 sim. / ASTM D257
Dielectric strength E_d		IEC 60243-1 / VDE 0303-21
(in oil at 90°C, parallel to layers)	40 kV	DIN 53481 sim. / ASTM D149
(in oil at 90°C, perpendicular to layers)	40 kV	
Tracking resistance V	CTI 200	IEC 60112 / VDE 0303-11
		DIN 53480 sim.
		ASTM D3638 / UL 746A

Thermal properties

Melting temperature T_m (DSC, 10°C/min)		ISO 11357-1,-3
		ASTM D3418 sim.
Thermal conductivity λ (23°C)	0.30 W/(m·K)	ISO 22007-2 / ISO 8302 sim.
		DIN 52612-2/ASTM C177 sim.
Specific heat (thermal capacity) c		ISO 11357-4
		ASTM E1269/ASTM C351 sim.
Coefficient of linear thermal expansion α		ISO 11359-2
(average value 23-60°C)	$10 \cdot 10^{-6} \cdot K^{-1}$	DIN 53752/ASTM E831 sim.
Service temperature		
long term (min / max - 5000 h)	- / 120 °C	
short term (not under stress - few hours)	130 °C	
Vicat softening point		ISO 306
VST A50 - 10N		DIN 53460 sim.
VST B50 - 50N		ASTM D1525
Heat deflection temperature		DIN EN ISO 75-1,-2
HDT A - 1.80 MPa		DIN 53461 sim.
HDT B - 0.45 MPa		ASTM D648
Flammability		
according to UL94 (thickness 3 / 6 mm)	V-0	
oxygen index		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.