

Technical Information

VETRESIT^â 312

MATERIAL A laminate consisting of heat-resisting cycloaliphatic epoxy resin reinforced with one-directional roving glass fabric (UD) and with glass mat.

GENERAL PROPERTIES Very high mechanical strength, even at higher temperatures, especially in the longitudinal (wrap) direction (MR) of the roving glass fabric, with good properties in the cross direction (QR) to ensure satisfactory absorption of bending, torsional or shear forces.

Good electrical properties at higher temperatures and moisture. Resists tracking and chemicals. Low density.

Service temperature up to 155 °C.

APPLICATION

- For mechanical and electrical applications operating at high temperatures.
- For construction components with very high mechanical stresses in one preferential direction (MR).
- All kinds of traction elements like threaded bolts, rods etc
- Long term stressed spring components
- For electrical machines end equipment operating in the highest voltage and output ranges.
- For superconductor applications (cryogenic temperatures).
- For equipment components in the chemical industry.

SUPPLY

Machined Parts
Fabricated and styled according to customer's drawings.
Optional varnished (standard: clear).

Fastenings
Cylindrical rods (blank or threaded), bolts
Cut from standard sizes. Diameter: 6 - 80 mm.

Feather key wedge
Manufactured according to customer's drawings

MACHINABILITY VETRESIT 312 can be sawn, milled, turned, drilled or ground. Since glass fibre materials subject machining tools to considerable wear, very sharp hard metal tools or preferably diamond tools should be used. The material can be machined dry using a dust and chip vacuum extractor, or wet with a suitable cooling liquid.

Expert joining of VETRESIT-parts and of VETRESIT to other materials will be professionally done on request, as it is a speciality of MICAFIL AG. Do not hesitate to contact us for this kind of services.



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	Properties		Standards	Units	Values
	Resin: Epoxy resin (EP)				
	Support: Glass matt, Roving glass fabric		ISO 1172	mass %	≥ 60
	Density		ISO 1183	g/cm ³	1,8 - 2,1
Electrical properties	Electric strength, ⊥ 50 Hz, 1 Min., h = 3 mm	23 °C 90 °C	IEC 243-1	kV/mm	13,5 - 20 13,5 - 20
	Electric strength, 50 Hz, 1 Min., h = 25 mm	23 °C 90 °C	IEC 243-1	kV/mm	2,5 - 3,5 2,5 - 3,5
	Volume resistivity		IEC 93	MΩ • cm	10 ⁶ - 10 ¹⁰
	Surface resistivity		IEC 93	MΩ	10 ⁵ - 10 ⁹
	Insulation resistance, wet		IEC 167	MΩ	10 ⁴ - 10 ⁶
	Dissipation factor tg δ 50 Hz	RT 90 °C	IEC 250		0,02 - 0,05 0,03 - 0,10
	Relative permittivity ε _r 50 Hz	RT 90 °C	IEC 250		4,5 - 5,5 5,0 - 6,0
	Comparative tracking index (Solution A)		IEC 112	CTI	600
	Arc resistance		ASTM D-495	s	130
Mechanical properties	Tensile strength	MR QR	ISO 527	N/mm ²	≥ 350 ≥ 100
	Flexural strength	MR QR	ISO 178	N/mm ²	450 - 650 ¹⁾ 200 - 350 ¹⁾
	Compressive strength	⊥ 	ISO 604	N/mm ²	≥ 350 ≥ 150
	Impact strength	⊥ 	ISO 179	kJ/m ²	≥ 200 ≥ 180
	Impact strength, notched specimen (Charpy)	⊥ 	ISO 179	kJ/m ²	≥ 150 ≥ 100
	Flexural module of elasticity (3 point method)	MR QR	ISO 178	N/mm ²	18 - 25 · 10 ³ 15 - 20 · 10 ³
	Splitting load		DIN 53463	N	3000 - 5000

¹⁾ After heating for 1 hour at 150°C, the flexural strength measured at 150°C should be at least 50% of the value measured at ambient temperature.

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	Properties	Standards	Units	Values
Thermal properties	Temperature class	IEC 85	°C	F (155)
	Linear thermal expansion (20 - 100°C)	MR QR	DIN 52328	K ⁻¹ 13 - 18 10 ⁻⁶ 8 - 13 10 ⁻⁶
	Thermal conductivity (20 - 100°C)	⊥	VDE 0304 T1	W/m K 0,35 - 0,40
	Flammability	ASTM D-635		Selfextinguishing
Physical and chemical properties	Water absorption h = 4 mm, method A	ISO 62	mg mass %	≤ 29 ≤ 0,10
	Oil absorption (24h/55°C + 4h in oil 90°C) h = 4 mm		mass %	≤ 0,01
	Resistance against: - solvents (except phenols and ketones) - mineral oils - Acids (diluted), bases	ASTM D - 543		good very good good

⊥ perpendicular to layers
 || parallel to layers
 MR machine direction along support
 QR cross direction to support

These properties have been determined by the above shown methods. The data given are valid for standard test specimen only. Unless otherwise specified, all data were measured at ambient temperature on specimen as manufactured and without particular treatment. The contents of this publication are based on our present experience. They are an indication for application of our products without any liability for us. Notice of legal requirements and existing patent rights has to be taken. Due to the many application and manufacturing possibilities, we cannot give any warranty for the technical results in individual cases.



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