

Technical Information

VETRESIT^â 304

MATERIAL A laminate consisting of heat-resisting modified epoxy resin reinforced with one-directional roving glass fabric (UD) and with a 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 chemicals. Low density.

Service temperature up to 180 °C.

APPLICATION

- For mechanical and electrical application, even at high temperature.
- For machined components under high mechanical stress in a preferential direction (MR).
- All kinds of traction elements like threaded bolts, rods etc
- Long term stressed spring components.
- For electrical machines and equipment operating at high voltage 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 – 55 mm

Spring Wedges
Manufactured according to customer's drawings.



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	Properties		Standards	Units	Values
	Resin: Epoxy resin (EP) modified				
	Support: Glass mat, Roving glass fabric		ISO 1172	mass %	≥ 60
	Density		ISO 1183	g/cm ³	1,7 - 2,1
Electrical properties	Electric strength, ⊥ 50 Hz, 1 min., h = 3 mm	RT 90 °C	IEC 243-1	kV/mm	10 - 15 10 - 15
	Electric strength, ∥ 50 Hz, 1 Min., h = 25 mm	RT 90 °C	IEC 243-1	kV/mm	1,4 - 3 1,4 - 3
	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	150
	Arc resistance		ASTM D-495	s	130
Mechanical Properties	Tensile strength	MR	ISO 527	N/mm ²	≥ 450
	- at ambient temperature	QR		N/mm ²	≥ 140
	- at 150 °C	MR		%	≥ 75 ¹⁾
	Flexural strength	MR	ISO 178	N/mm ²	≥ 600
	- at ambient temperature	QR			≥ 250
	- at 150 °C	MR	ISO 178	%	≥ 82 ¹⁾
	- at 180 °C	MR	ISO 178	%	≥ 80 ¹⁾
	After ageing 28d / 200 °C				
	- at ambient temperature	MR	ISO 178	N/mm ²	≥ 600
	- at 150 °C	MR	ISO 178	%	≥ 85 ¹⁾
	- at 180 °C	MR	ISO 178	%	≥ 80 ¹⁾
	Flexural modulus of elasticity				
	- at ambient temperature	MR	ISO 178	N/mm ²	≥ 24 · 10 ³
- at 180 °C	MR			≥ 20 · 10 ³	
Compressive strength	⊥ ∥		ISO 604	N/mm ²	≥ 450 ≥ 300
Splitting load			DIN 53463	N	≥ 4000

1) After heating for 1 hour at 150°C /or at 180°C/ the strength measured at 150°C /or at 180°C/ should be at least the indicated %-value of the value measured at ambient temperature.

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	Properties	Standards	Units	Values
Physical and chemical properties	Water absorption h = 4 mm, Method A	ISO 62	mg mass %	≤ 29 ≤ 0,10
	Oil absorption h = 4 mm (24h/50°C + 4h in oil 90°C)		mass %	≤ 0,01
	Resistance against: - solvents (except phenols and ketones) - mineral oils - diluted acids	ASTM D-543		good 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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