TUFNOL

GRADE PGM

PGML Material
Polyester Glass Mat Laminates

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Polyester glass mat laminates.

TUFNOL Polyester glass mat laminates are produced by combining polyester resin with continu-ous roving glass mat. They are a useful group of materials that fall in price and performance between paper and cotton fabric laminates and high performance woven glass types.

Two grades are available, offering compliance with NEMA Types GPO-2, NEMA GPO-3 and DIN 7735 Type Hm 2471. These materials have excellent mechanical and electrical properties and are widely used in applications where good electrical insulation is required up to thermal class F temperatures (155°C).

TUFNOL PGM Grades.

Grade PGM/2

An electrical grade with assessed flammabiltiy characteristics (UL 94 V-0). Good for cold punch-ing. Colour ivory. NEMA Type GPO-2. Suitable for thermal class F applications. Available in sheets from 0.8mm to 25mm thick.

Grade PGM/3

An electrical grade with assessed flammability characteristics (UL 94 V0) plus excellent arc and track resistance. Colour red. NEMA Type GPO-3 and DIN 7735 Type 2471. Suitable for thermal class F applications. Available in sheets from 0.8mm to 25mm thick.

Types available

Sheet Sizes

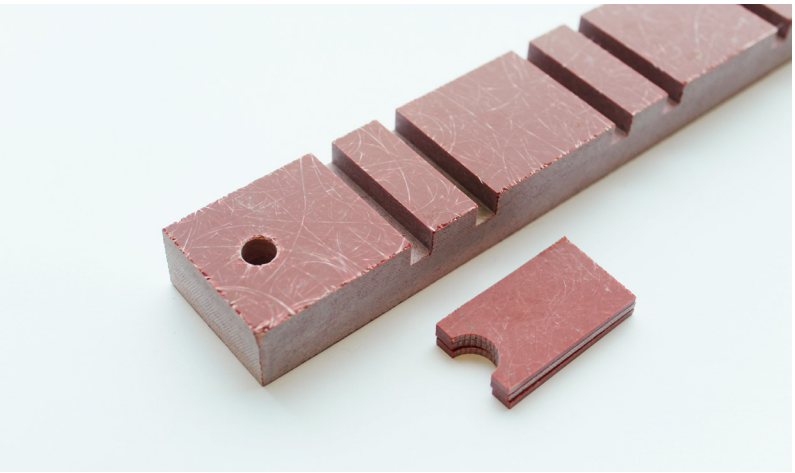
Standard sheet size is 2000 mm x 1250 mm. Cut pieces can be supplied to order.

Sheets are available in thicknesses ranging from 0.8 mm to 50 mm.

Machining

Components are produced from TUFNOL Polyester glass mat laminates by machining on standard machine tools using the techniques for machining other TUFNOL Glass reinforced laminates, including the use of carbide or diamond tipped tools, where appropriate.

They can be guillotined and punched up to 4mm thick. TUFNOL Ltd. have comprehensive facilities for the machining of PGM materials and can economically produce finished components to customers drawings.



Physical Properties

Property	GRADE PGM/2	GRADE PGM/3	Units
Flexural strength	130	130	MPa
Flexural modulus	7.8	8.2	GPa
Tensile strength	70	70	MPa
Tensile modulus	4.6	4.0	GPa
Impact strength, Charpy	35	40	kJ/m²
Water absorption 3mm thick	0.30	0.27	%
Dielectric breakdown parallel to laminations	40	40	kV
Perpendicular dielectric strength	9	15	kV/mm
Comparative tracking index (IEC112)	600	600	-
Flammability category IEC 707 (UL-94)	V0	V0	-
Relative density	1.7	1.8	-
Maximum working temperature*			
- continuous	140	140	°C
- intermittent	155	155	°C
Thermal classification	Class F	Class F	
Thermal expansion	2.4	2.4	x10-⁵/K
Thermal conductivity	0.3	0.3	W/(mk)

Note: Tests are to ASTM methods, where applicable.

*Users of highly stressed components at temperatures approaching the maximum are recommended to seek further advice from TUFNOL Ltd.

Notes

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Reliability in the field of engineering plastics & composites.

Tufnol is the byword for quality in laminated plastics and resin based materials for engineering applications. It was invented here in the UK and its development to meet modern engineering demands continues to keep it abreast of 21st century technology.

This type of material is known as 'synthetic resin bonded laminated plastic', and is made from layers of paper, cotton cloth or woven glass fibre cloth, dipped in resin, then compressed and bonded together in a hot press. It is a strong, hard material, made in a number of different grades with varying properties and uses.

Tufnol's reliability is key to the many sectors of engineering industry in which it serves.

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