TUFNOL Grade 10G/40

Epoxy glass fabric laminate

Resin: Epoxy resin.
Reinforcement: Continuous filament woven glass fabric.

Description: Grade 10G/40 is a high quality epoxy resin bonded glass fabric laminate. It has very high mechanical strength with low moisture absorption and it exhibits excellent electrical properties, under both dry and humid conditions. It is a rigid material with good dimensional stability and good resistance to a wide range of working environments. It is suitable for continuous use at temperatures up to approximately 130°C (Class B).

Typical uses: This high performance material is used for a very wide variety of applications where high strength, rigidity, dimensional stability and electrical performance are required. Applications such as insulation in large turbine generators, components for cryogenic superconducting magnets, high strength bolt insulation in structures, jigs for electro-chemical machining and structural insulation for high performance electronic equipment, these are typical of the many uses to which this material is put. However, due to the abrasive nature of the high glass fibre content, Grade 10G/40 is not normally selected for wearing or bearing applications.

Types available: Available in sheet and in moulded round rod, both in natural colour only.

SIZE RANGE

Sheet

Thickness: 0.15 to 101.6mm (0.006" to 4")

Sheet Sizes: 1220 x 1220mm approx.
1600 x 1220mm approx.
For guaranteed minimum sheet sizes, refer to TUFNOL Ltd.
For 1600 mm long sheets, minimum order quantities may apply.

Round Rod

Diameter: 12.7 to 50.8 (1/2" to 2")
Length approx: 1200 mm

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SPECIFICATIONS

BRITISH STANDARDS

Sheet BS3953 Type EP-3

Rod BS6128 Part 2 Type EP GC 21

NEMA*

Sheet Nema LI-1-1983 Type G10

*Certification to this standard is subject to special enquiry. Standard quality testing is to British Standards.

APPROXIMATE WEIGHTS

Sheets

Sheet size 1220 x 1220 approx.
Approx. weight in kg = 2.94 x thickness in mm

Sheet size 1600 x 1220 approx.
Approx. weight in kg = 3.86 x thickness in mm

Due to slight variations in density and nominal dimensions, weight cannot be calculated precisely.

Weight Formulae

Cut pieces:

$$\text{Weight in kg} = \frac{1.98 \times \text{Length} \times \text{Width} \times \text{Thickness (all in mm)}}{1{,}000{,}000}$$

Rod

$$\text{Weight in kg} = \frac{1.55 \times \text{Dia}^2 \times \text{Length (all in mm)}}{1{,}000{,}000}$$

PHYSICAL PROPERTIES OF GRADE 10G/40

SHEET

PROPERTY	TYPICAL RESULT	UNITS
Cross breaking strength	490	MPa
Impact strength, notched, Charpy	60	kJ/m^2
Compressive strength, flatwise	415	MPa
Compressive strength, edgewise	300	MPa
Water Absorption 1.6mm thk.	5	mg
3mm thk.	7	mg
6mm thk.	10	mg
12mm thk.	15	mg
Electric strength, flatwise in oil at 90° C		
1.6mm thk.	17	MV/m
3mm thk.	15	MV/m
6mm thk.	12	MV/m
12 mm thk.	9.0	MV/m
Electric strength, edgewise in oil at 90°C	75	kV
Insulation resistance after immersion in water	$1x10^{11}$	ohms
Loss tangent at 1 MHz	0.017	-
Permittivity at 1 MHz	5.0	-
Comparative tracking index	285	-
Relative density	1.90	-
Maximum working temperature**		
continuous	130	°C
intermittent	150	°C
Thermal classification	Class B	-
Thermal conductivity through laminae	0.42	W/(mK)
Thermal expansion in plane of laminae	1.1	$x10^{-5}/K$

Test methods as BS3953, where applicable.

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

ROUND RODS

PROPERTY	TYPICAL RESULT	UNITS
Flexural strength	600	MPa
Water absorption	0.5	mg/cm^2
Insulation resistance after immersion in water	5×10^9	ohms
Axial electric strength in oil at 90°C	70	kV
Relative density	1.90	-

Test methods as BS 6128

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A full machining service is available for this and many other engineering plastics and composites.

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