TUFNOL Grade 1P/24

Paper based FR laminate

Resin: Phenolic resin (flame retardant low smoke formulation).
Reinforcement: Kraft paper.

Description: This is an insulating sheet material with properties similar to Kite Brand TUFNOL but with the additional features of improved fire properties. TUFNOL Grade 1P/24 is manufactured with a specially formulated phenolic resin, which provides flame retardant properties and a much reduced smoke output in a fire. It is a good electrical insulating material meeting the requirements of BS 2572 Type P3 and it also meets Class FV0 Flammability in the BS 6334 (IEC 707) test. In addition, it achieves Class 1 performance in the BS 476 Part 7 'Surface spread of flame' test.

Typical uses:- TUFNOL Grade 1P/24 is used in electrical applications where a high quality electrical insulating sheet is required with the additional protection of improved fire properties. Many conventional insulation applications would benefit from the use of flame retardant materials and the low smoke and good spread of flame performance offered by Grade 1P/24 is of particular importance in areas where escape from fire may be restricted. It can be used for items such as terminal boards, mounting plates, busbars and cable supports in railway applications, ships and ferries and a wide range of underground and restricted access areas.

Types available: Available in natural colour and in sheet only.

SIZE RANGE

Sheet

Thickness: 0.8 to 25.4mm (1/32" to 1")

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.

TUFNOL Grade 1P/24

SPECIFICATIONS

BRITISH STANDARDS

Sheet BS2572 Type P3
plus Flammability category FV0
plus BS 476 Part 7 Surface Spread of Flame Class 1

APPROXIMATE WEIGHTS

Sheets

Sheet size 1220 x 1220 approx.
Approx. weight in kg = 2.10 x thickness in mm

Sheet size 1600 x 1220 approx.
Approx. weight in kg = 2.76 x thickness in mm

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

Weight Formulae

Cut pieces:

$$\text{Weight in kg} = \frac{1.40 \times \text{Length} \times \text{Width} \times \text{Thickness (all in mm)}}{1{,}000{,}000}$$

PHYSICAL PROPERTIES OF GRADE 1P/24

SHEET

PROPERTY	TYPICAL RESULT	UNITS
Cross breaking strength	150	MPa
Shear strength, flatwise	90	MPa
Water Absorption 1.6mm thk.	50	mg
3mm thk.	65	mg
6mm thk.	80	mg
Electric strength, flatwise in oil at 90° C		
1.6mm thk.	11	MV/m
3mm thk.	9	MV/m
Electric strength, edgewise in oil at 90°C	45	kV
Insulation resistance after immersion in water	5×10^9	ohms
Loss tangent at 1 MHz	0.040	-
Permittivity at 1 MHz	5.4	-
Flammability category	FV0	-
Relative density	1.36	-
Maximum working temperature*		
continuous	90	°C
intermittent	120	°C
Thermal classification	Class E	-

Test methods as BS2572, where applicable.

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

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

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