



GRADE 6F/45

SRBF Material
Synthetic Resin Bonded Fabric

Cotton fabric based epoxy laminate
Fine weave cotton/Epoxy resin laminated plastic

SRBF Material. GRADE 6F/45.

A top quality epoxy grade combining electrical performance with first class mechanical capabilities

This TUFNOL epoxy cotton grade has a unique combination of properties, which makes it particularly useful for applications requiring extra performance. It has good all-round performance but its principal features are its excellent electrical properties, good dimensional stability and outstanding machinability.

Grade 6F/45 is made with a specially modified epoxy resin, which gives it high insulation resistance and electric strength, and an exceptional resistance to surface electrical tracking. These first class electrical properties, with the excellent wear resistance of the finer weave cotton, together provide a combination of properties not found in other grades.

Grade 6F/45 is mechanically strong and is resistant to a wide range of chemicals. It has low water absorption and good dimensional stability, giving fine tolerances and a superb machined finish.

What is Grade 6F/45 used for?

This versatile grade is used for a very broad range of applications, where precision and a high quality machined finish need to be combined with electrical or mechanical performance. It is used for rotor blades in compressors, slip ring assemblies in helicopters. Windshield components on commercial aircraft, high vacuum components, slot wedges, coil supports in turbine generators, labyrinth seals, insulating gears in scientific instruments, electrical mounting plates and large electrical terminal blocks.

Types available

| | Sheets | Rods | Tubes | Other Sections |
|----------------|--------|------|-------|----------------|
| Natural colour | Yes | Yes | Yes | Yes* |

*Minimum order quantities may apply.

Specifications for GRADE 6F/45

| British Standards | Current Standards | Recent Standards (now obsolete) |
|------------------------------|--------------------------------------|---------------------------------|
| Sheet | BS EN 60893-3-2 Type EP CC 301 | BS 2572 Type F6 |
| Round Rod (rolled & moulded) | BS EN 61212-3-3 Type EP CC 41 1 | - |
| Rectangular Bar | BS 6128 Part 4 Type PF CC 41 & 42 | (BS 6128 is now obsolete.) |
| Hexagon Bar | BS 6128 Part 6 Type PF CC 61 & 62 | - |
| Round Tube | BS EN 61212-3-2 Type EP CC 31 | - |
| Rectangular Tube | BS 6128 Part 13 Type PF CC 131 | - |



Physical Properties

| Property | Typical Result | Units |
|---------------------------------------------------|----------------------|-----------------------|
| Cross breaking strength | 170 | MPa |
| Impact strength, notched, Charpy | 4.6 | kJ/m ² |
| Compressive strength, flatwise | 290 | MPa |
| Compressive strength, edgewise | 190 | MPa |
| Shear strength, flatwise | 100 | MPa |
| Water Absorption | | |
| - 1.6mm thk. | 30 | mg |
| - 3mm thk. | 35 | mg |
| - 6mm thk. | 45 | mg |
| - 12mm thk. | 55 | mg |
| Electric strength, flatwise in oil at 90°C | | |
| - 1.6mm thk. | 15 | MV/m |
| - 3mm thk. | 12 | MV/m |
| - 6mm thk. | 10 | MV/m |
| Electric strength, edgewise in oil at 90°C | 80 | kV |
| Insulation resistance after immersion in water | 3 x 10 ¹¹ | ohms |
| Loss tangent at 1 MHz | 0.040 | - |
| Permittivity at 1 MHz | 4.3 | - |
| Comparative tracking index | 800 | - |
| Relative density | 1.36 | - |
| Maximum working temperature** | | |
| - continuous | 130 | °C |
| - intermittent | 150 | °C |
| Thermal classification | Class B | - |
| Thermal conductivity through laminae | 0.36 | W/(mK) |
| Thermal expansion in plane of laminae | 1.8 | x 10 ⁻⁵ /K |
| Specific heat | 1.5 | kJ/(kgK) |

Test methods as BS EN 60893-2, where applicable.

GRADE 6F/45
Round Tube

| Property | Typical Result | Units |
|---------------------------------------------|----------------------|--------------------|
| Axial compressive strength | 180 | MPa |
| Cohesion between layers | 130 | MPa |
| Water absorption | 1.2 | mg/cm ² |
| Insulation resistance after immersion water | 1 x 10 ¹⁰ | ohms |
| Loss tangent at 1 MHz | 0.04 | - |
| Permittivity at 1 MHz | 4.0 | - |
| Axial electric strength in oil at 90°C | 75 | KV |
| Radial electric strength in oil at 90°C | | |
| - 1.6mm wall | 13 | MV/m |
| - 3.0mm wall | 10 | MV/m |
| Relative density | 1.35 | - |

Test methods as BS EN 61212-2, where applicable.

GRADE 6F/45
Round Rod

| Property | Typical Result | Units |
|------------------------------------------------|----------------------|--------------------|
| Flexural strength | 170 | MPa |
| Water absorption | 1.3 | mg/cm ² |
| Insulation resistance after immersion in water | 1 x 10 ¹⁰ | ohms |
| Axial electric strength in oil at 90°C | 80 | kV |
| Relative density | 1.35 | - |

Test methods as BS EN 61212-2, where applicable.

-users of highly stressed components at temperatures approaching the maximum are recommended to seek further advice from Tufnol Composites Ltd.

SRBF Material. GRADE 6F/45.

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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Tufnol warrants the materials it produces will conform to Tufnol specifications. It is entirely the customer's responsibility to make the final product choice and satisfy themselves of the suitability of the product for the intended application and carrying out testing where required. Tufnol does not warrant the conformity of its materials to these properties or the suitability of its materials for any particular purpose.

The values are "typical only" and are based on test results generally in accordance with Test methods BS EN 60893-2, where applicable.