



# GRADE 1P/13

**SRBP Material**  
**Synthetic Resin Bonded Paper**

Phenolic Paper laminate  
Paper/phenolic resin laminated plastic

# SRBP Material.

## GRADE 1P/13

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**An economical commercial paper grade.**

Tufnol Grade 1P/13 is a low cost commercial paper based laminate, produced to meet the need for an economical material where electrical requirements are moderate. As a good basic, low voltage insulation material, this grade has a higher mechanical strength than the other grades in our phenolic paper range and greater impact strength. It can be machined readily and components can be hot punched in thicknesses up to 3.2mm.

**What is Grade 1P/13 used for?**

This material is used for many electrical components where low voltage insulation is required. In addition, the low cost and all round properties of Grade 1 P.13 make it a popular choice for many less demanding mechanical duties. Consequently, it is used for a multitude of different engineering parts, such as spacers, base plates, side plates, and simple jigs and fixtures, in addition to the usual range of electrical insulation components.

## Types available

Sheets	
Natural colour	Yes
Black Grade 1P/13	Yes*

\*Minimum order quantities may apply.

## Specifications for GRADE 1P/13

British Standards	Current Standards	Recent Standards (now obsolete)
Sheet	BS EN 60893-3-4 Type PF CP 201	BS 2572 Type P1

Standard quality testing is to British Standards.



## Physical Properties

Property	Typical Result	Units
Cross breaking strength	175	MPa
Impact strength, notched, Charpy	3.9	kJ/m <sup>2</sup>
Shear strength, flatwise	100	MPa
Tensile strength	164	MPa
Youngs modulus	10.4	GPa
<b>Water Absorption</b>		
- 1.6mm thk.	65	mg
- 3mm thk.	80	mg
- 6mm thk.	100	mg
- 12mm thk.	150	mg
<b>Electric strength, flatwise in oil at 90°C</b>		
- 1.6mm thk.	10	MV/m
- 3mm thk.	6.2	MV/m
- 6mm thk.	4.0	MV/m
Electric strength, edgewise in oil at 90°C	25	kV
Insulation resistance after immersion in water	5 x 10 <sup>8</sup>	ohms
Loss tangent at 1 MHz	0.04	-
Permittivity at 1 MHz	5.4	-
Relative density	1.36	-
<b>Maximum working temperature**</b>		
- continuous	90	°C
- intermittent	120	°C
Thermal classification	Class E	-

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

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



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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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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.