

## ***TUFNOL Rolled Laminated Glass Fabric Tubes***

Epoxy Glass Fabric laminate

Glass fibre/epoxide resin laminated plastic tubes

(SRBGF - Synthetic Resin Bonded Glass Fabric)

### **Strong, rigid laminated tubes**

TUFNOL Rolled Laminated epoxy glass fabric tubes have good mechanical strength, low water absorption and are resistant to weathering and to chemical attack by mild acids and alkalis. They are strong and rigid, with good bursting strength and excellent electrical insulation properties.

Three grades are available:

- - Grade RL G/1 is a strong, rigid material, with good moisture resistance and excellent electrical insulation properties. It has good dimensional stability and is resistant to a wide range of working environments. It may be used in Class B (130°C) electrical applications.
- - Grade RL G/2 is similar to Grade RL G/1 and meets additional standards for flammability properties. It is a strong, rigid material, with good moisture resistance and excellent electrical properties. It has good dimensional stability and is resistant to a wide range of working environments. It is used in Class B (130°C) electrical applications.
- - Grade RL G/3 is made with an epoxy resin which is specially formulated to give improved performance at raised temperatures. It is a strong, rigid material, with good moisture resistance and excellent electrical properties. It has good dimensional stability and is resistant to a wide range of working environments. It is used in Class F (155°C) applications.

### **What are TUFNOL RL Epoxy Glass Fabric tubes used for?**

These materials are used for many applications where strong, rigid tubes are required for the manufacture of cylindrical components for mechanical or electrical insulation uses.



- RL G/1 is the main general purpose grade and the other two grades may be selected where their particular additional properties are required. Grade RL G/1 is used for a wide variety of applications where a strong, high performance insulating tube material is required. Typical uses include mechanical components or electrical insulation for machines operating at slightly raised temperatures and in electronic equipment or for insulation where high strength and very long life is required.

- RL G/2 is normally selected where the same type of tube is required, but with additional fire properties. Typical applications include electrical insulation for machines operating at slightly raised temperatures and in electronic equipment.

- RL G/3 is normally selected where a similar material is required but with the extra temperature capability of a Class F material. Typical applications include electrical insulation for machines operating at raised temperatures and in a wide range of electronic equipment.

TYPES AVAILABLE	Tubes
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Grade RL G/1 – natural colour	Yes
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Grade RL G/2 – natural colour	Yes
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Grade RL G/3 – natural colour	Yes
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Minimum order quantities may apply.

## ***SPECIFICATIONS for TUFNOL RL Cotton Fabric Tubes***

BRITISH STANDARDS	Current Standards	Recent Standards (now obsolete)
Grade RL G/1 tube	BS EN 61212-3-1 Type EP GC 21	BS 6128 Part 8 Type EP GC 81
Grade RL G/2 tube	BS EN 61212-3-1 Type EP GC 21 plus added flammability properties	BS 6128 Part 8 Type EP GC 81 (plus added flammability properties)
Grade RL G/3 tube	BS EN 61212-3-1 Type EP GC 22	BS 6128 Part 8 Type EP GC 81

## PHYSICAL PROPERTIES

### TUFNOL RL Epoxy Glass Fabric Tubes

PROPERTY	Grade	Grade	Grade	UNITS
	RL G/1	RL G/2	RL G/3	
	TYPICAL RESULT	TYPICAL RESULT*	TYPICAL RESULT*	
Axial compressive strength	200	220	220	MPa
Cohesion between layers	500	500	500	MPa
Water absorption	0.22	0.30	0.30	mg/cm <sup>2</sup>
Insulation resistance after immersion in water	1 x 10 <sup>10</sup>	1 x 10 <sup>10</sup>	1 x 10 <sup>11</sup>	ohms
Loss tangent at 1 MHz	0.017	0.016	0.016	-
Permittivity at 1MHz	4.6	4.7	4.7	-
Axial electric strength in oil at 90°C	70	-	-	kV
Electric strength normal to axis in oil at 90°C				
- 1.6mm wall	12	-	-	MV/m
- 3.0mm wall	9	-	-	MV/m
Flammability category	-	FV0		-
Relative density	1.80	1.80	1.80	-
Maximum working temperature**				
- continuous	120	120	140	°C

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

\*Note: Data on this grade is provisional and is based on a small number of tests.

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