

TUFNOL

Stand-off Insulators

TUFNOL Moulded Stand-off Insulators are resistant to:

- Tracking
- Shock loading
- Climatic deterioration
- Moisture
- Oil and chemical absorption

. . . giving less need for replacement and plant downtime.

Suitable for use at 660v, the range of TUFNOL stand-off insulators has been designed for the electrical engineer involved with power systems for overhead cranes, with collector gear, bus bar systems, switchboard and transformer manufacture and other medium voltage applications where a robust, high quality stand-off insulator is required.

Developed to meet exacting conditions, TUFNOL insulators have high strength and, due to their unique combination of physical properties, will withstand climatic extremes without deterioration. They are impervious to moisture, oil and most chemical fumes. Under normal conditions, dirt and dust do not readily adhere to their smooth surfaces. These advantageous features coupled with robust design and proven reliability enable all types of TUFNOL moulded insulators to be used with complete satisfaction in arduous industrial environments.

Standard Types

Two types of moulded insulator are available namely bell and barrel. They are available in three different types of material, paper reinforced phenolic (Kite Brand TUFNOL), glass fibre reinforced polyester and glass fabric reinforced phenolic (Grade 10G/24). The reinforced phenolic types are recommended where mechanical strength is important. Polyester glass types provide enhanced electrical features but with slightly lower mechanical strength.

Barrel Insulators

There are two standard types of barrel insulator, Type A and Type B. Both types can be used either horizontally or vertically and have brass inserts which are specially shaped to resist torsion and tension. The inserts are available with a choice of thread sizes. Threaded brass fixing stems, in lengths to suit the users' requirements, can be supplied with the insulator.

Type A barrel insulators are made only in

polyester glass and are red in colour. They are widely used as stand-off insulators by switchgear and transformer manufacturers.

Type B barrel insulators are slightly different in shape and have a drip ridge moulded round in the middle. They are available in all of the 3 materials previously mentioned. Where rugged heavy duty conditions are likely to be encountered, the Kite Brand type is recommended. However, where conditions are less arduous and mechanical strengths are less important the polyester glass insulators, with their enhanced electrical properties, are an attractive alternative. TUFNOL Grade 10G/24 phenolic glass insulators are used where high strength is required at raised temperatures.

Bell Insulators

Bell insulators are available in all of the 3 alternative materials. They are usually mounted vertically and incorporate a specially designed leakage path to minimise the risk of flashover in adverse conditions. If required, threaded brass fixing stems, in lengths to suit the users' requirements, can be supplied with the insulator.

Technical Information

Reinforced Phenolic

The reinforced phenolic insulators have superior mechanical properties and are designed for use up to 660v. Grade 10G/24 is recommended for use in temperatures ranging from 100°C to 150°C and where chemical resistance is required. Each insulator is proof tested at 2.2kV for one minute and is stamped accordingly before despatch.

Polyester Glass

The polyester glass types are manufactured from a dough moulding compound and have enhanced electrical features but slightly lower mechanical strength. Properties for this material are shown in the table overleaf.

TUFNOL Stand-off Insulators

MATERIAL PROPERTIES (Polyester Glass)

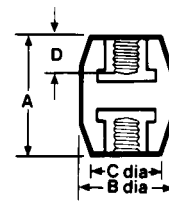
Property	Typical Values	Units
Density	1.73	g/ml
Water absorption	20	mg
Tensile strength	41	MPa
Flexural strength	92	MPa
Charpy impact strength (notched)	20	kJ/m ²
Electric strength at 90°C	8.0	MV/m
Insulation resistance	10 ^{12.3}	ohms
Loss tangent at 1 MHz	0.013	-
Permittivity at 1 MHz	4.1	-
Comparative tracking index to IEC112	> 1000	-

Note: Test methods to BS2782, except where indicated. The values quoted in the table have been obtained by applying tests to standard specimens of the material from which polyester glass insulators are made. They do not necessarily indicate the performance of commercial parts, which may differ due to the conditions of manufacture, the design of the part, or other factors.

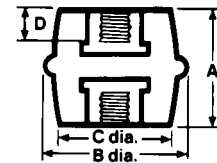
STANDARD RANGE

When ordering from the standard range, simply state the stock number and thread insert required.

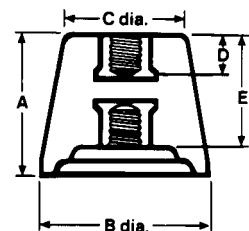
	Stock No.	Ultimate Tensile Strength	Material	Insert Thread Size	Dimensions (mm)				
					A	B	C	D	E
BARREL TYPE A	30	1550 kg	Polyester	M12	50.8	47.6	41.3	12.7	-
	31	450 kg	Polyester	M6	28.6	22.2	15.9	7.9	-
	32	750 kg	Polyester	M8	31.8	28.6	20.6	9.5	-
	33	1100 kg	Polyester	M10	41.3	38.1	28.6	9.5	-
BARREL TYPE B	34	1800 kg	Kite Brand	M10, M12 3/8" BSW 1/2" BSW	38.1	47.6	38.1	9.5	-
	35G	1800 kg	Grade 10G/24	M10, M12 3/8" BSW 1/2" BSW	38.1	47.6	38.1	9.5	-
	36	1100 kg	Polyester	M10, M12 3/8" BSW 1/2" BSW	38.1	47.6	38.1	9.5	-
	37	3600 kg	Kite Brand	M12, M16 1/2" BSW 5/8" BSW	50.8	63.5	50.8	15.9	-
	38G	3600 kg	Grade 10G/24	M12, M16 1/2" BSW 5/8" BSW	50.8	63.5	50.8	15.9	-
	39	2200 kg	Polyester	M12, M16 1/2" BSW 5/8" BSW	38.1	47.6	38.1	9.5	-
BELL	40	4000 kg	Kite Brand	M12, M16 1/2" BSW 5/8" BSW	61.9	76.2	53.9	15.9	49.2
	41G	4000 kg	Grade 10G/24	M12, M16 1/2" BSW 5/8" BSW	61.9	76.2	53.9	15.9	49.2
	42	2200 kg	Polyester	M12, M16 1/2" BSW 5/8" BSW	61.9	76.2	53.9	15.9	49.2



Barrel Insulator Type A



Barrel Insulator Type B



Bell Insulator

Other sizes of insulator or thread insert size can be supplied, subject to special enquiry.

The information in this leaflet is believed to be correct, but accuracy and completeness are not guaranteed. The user shall be fully responsible for determining the suitability of products for the intended use.

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TUFNOL Ltd. manufacture a full range of technical laminated plastics which are supplied throughout the world. We also provide a comprehensive service for machined plastics components from our well equipped workshops and we are major distributors of all engineering plastics throughout the United Kingdom. We also manufacture a full range of pultrusions and filament wound composite sections.

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