



An ISO 9001 Company

Permal is an established high voltage insulating material, which offers unusual scope to the designer of electrical equipment. It is made of selected wood veneers, impregnated under vacuum with synthetic resin and densified under heat and pressure. This process combines the strength and resilience of natural timber with the dimensional stability and moisture resistance of thermosetting resin. The most important feature of Permal is that its maximum Mechanical Strength can be developed in any required direction to suit specific applications and generally conforms to IS-3513.

Permal has a unique combination of properties – good dielectric strength which does not alter with age, high strength/weight ratio, resistance to wear and fatigue – and it can be machined to an accuracy approaching that achieved with metals. It is an outstandingly successful material for electrical insulating components, which are subjected to several mechanical forces. Permal has been developed primarily for such applications.

Colour	Natural	
Sheet Size	1200 X 915MM, 2100 X 900MM	For Type 6 and 2
	1500 X 180MM, 815 X 210MM	For EV Type 5
	730 X 280MM	For EV Type 2 and 4
Thickness	5 to 75MM	EV Type 6
	5 to 50MM	EV Type 5
	5 to 40MM	EV Type 4 and 2



Properties	Test Method	Unit	Grade				
			EV Type 5	EV Type 6	EV Type 2	EV Type 4	EV Type 3
Specific Gravity	IS 1708	g/cm ³ (min)	1.25	1.25	1.25	1.25	1.5
Water Absorption	IS 3513	% Max.	1.2	1.2	1.2	1.2	1.8
Volatile Content	IS 1708 / PWL	% Max.	4	4	4	4	4
Sporadic Working Temperature	IS 513	°C Max.	90	90	90	90	90
Insulation Resistance, for Varnished specimen	IS 2259	Mohm (min)	10	10	10	10	10
Volume and Receptivity (Type Test)	IS3396	Ohm.cm	2.5x10 ⁹	2.5x10 ⁹	2.5x10 ⁹	2.5x10 ⁹	2.5x10 ⁹
Cross Breaking Strength 'A'	IS 1998	MPa (min)	170	100	120	140	N. A
Tensile Strength 'A'	IS 1998	MPa (min)	150	70	110	130	N. A
Compressive Strength							
Edge	IS 3513	MPa (min)	160	120	120	140	N.A
Flatwise	IS 3513	MPa (min)	80	185	140	120	185
Shear Strength Flatwise (Type Test)	PWL	MPa (min)	80	50	55	60	N. A
Impact Strength (Type Test)	BS2782 - 306A	Kg.cm(min)	70	30	50	55	N. A
Electrical Strength at 90°C(min)							
Flatwise (on 6MM thick Specimen)	IS 1998	KV/MM	4	4	4	4	4
Edgewise	IS 1998	KV/25MM	25	25	25	25	25
Comparative Tracking index, for Varnished Specimen	IEC 112	Volts(min)	100	100	100	100	N. A
Rockwell Hardness	IS 1586	'M' Scale	60	70	60	60	N. A

Type Test: Once in 12 months.

- Note: i. Generally, all test are to be carried out as per standard specification for corresponding properties
 ii. Test values given indicate characteristics of materials but no liability should be assumed or implied while considering the stated values
 iii. Dimensions/Size/ Thickness can be varied to suit specific requirements