



**PLASTICS & NON-METALLICS
FOR INDUSTRY SINCE 1921**

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Lamitex® FR4 Tube Technical Data

Lamitex FR-4 epoxy convolute wrapped tubes are reinforced with woven glass fabric. They are used for mechanical, electrical and electronic applications where extremely high mechanical strength at moderate temperatures is required. FR-4 meets NEMA FR4 self extinguishing requirements and has very good electrical properties in high humidity environments.

<u>Mechanical Properties</u>	<u>Test Method:</u>			<u>Conditioning</u>	
	<u>EN 61212-2</u>	<u>Standard</u>	<u>Test Specimen</u>	<u>IEC 212</u>	<u>Values</u>
Flexural Strength	4.1	ISO 178	id>100 mm	1	350 Mpa
Compressive Strength, Axial	4.2	ISO 604		1	230 MPa
Cohesion between layers	4.3	EN 61212-2	id<100 mm	1	400 MPa
 <u>Electrical Properties</u>					
Electric Strength in oil @ 90C:					
Perpendicular to Laminations	5.1	IEC 243-1	3 mm wall thk	2	10.0 kV/mm
Parallel to Laminations	5.1	IEC 243-1	>3 mm wall thk id>8mm and or od>10mm	2	50 kV/25 mm
Insulation resistance after immersion in water	5.2	IEC 167		4	10,000 M ohm
Permittivity:					
50Hz	5.3	IEC 250		3	4.5
1 MHz	5.3	IEC 250		3	4.5
Dissipation Factor:					
50Hz	5.3	IEC 250		3	0.01
1 MHz	5.3	IEC 250		3	0.01
 <u>Physical and Thermal Properties</u>					
Thermal endurance index @ 20,000 hrs	6.0	IEC 216		-	150°C T.I.
Density	7.2	IEC 1183-A	All	1	1.8 g/cm ³
Water Absorption	7.1	IEC 62-1		4	0.3 mg/cm ²

Conditioning: 1: 24h @ 23°C & 50%RH
2: 24h @ 23°C & 50%RH + 1hr in oil at 90°C
3: 96h @ 105°C + 1hr @ 23°C & 20%RH
4: 24h @ 50°C + 24hr in water at 23°C
5: 96h @ 105°C + 1hr in oil at 90°C

The standard length(s) for IDs 3 mm to 15 mm is 1220 mm and for IDs >15 mm to 1250 mm is 1220 mm and 1650 mm

All values are average test results from extensive testing of typical production material. No warranty is implied or guaranteed and testing is recommended for each application.

Epoxies • Phenolics • Melamine • Silicone • Sheets • Molded Shapes • Tubes • Cut to Size • Fabricated Parts

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