



STANDARD TYPES ACC. TO DIN EN 61212

Tubes made from industrial laminated materials

Designation DIN EN 61212	Characteristic property Applications	Flexural strength perpendicular to laminations	Compressive strength axial	Cohesion between layers	Dielectric strength perpendic. (3) thickness 3 mm	Dielectric strength parallel (3)	Insulation resistance	Permittivity 50 Hz	Permittivity 1 MHz	Dissipation factor 50 Hz	Dissipation factor 1MHz	Thermal endurance	Water absorption	Density	Combustibility
DIN EN 61212-2		5.1	5.2	5.3	6.1	6.1	6.2	6.3	6.3	6.3	6.3	7.1	7.2	7.3	UL 94
Unit		MPa	MPa	MPa	kV/mm	kV	MΩ					TI	mg/cm ²	g/cm ³	cat.
min/max		min	min	min	min	min	min	max	max	max	max	min	max		
EP GC 21	Electrical and mechanical applications, TC 130	300	175	200	7,7	40	1.000	-	5,2	0,05	0,04	130	1,5	1.7-1.9	-
EP GC 22	as type 21 but with TC 155	300 (1)	175	200	7,7	40	1.000	-	5,2	0,05	0,04	155	1,5	1.7-1.9	-
EP GC 23	as type 21 but with combustibility acc. to UL 94 V-0 	300	175	200	7,7	40	1.000	-	5,2	0,05	0,04	130	1,5	1.7-1.9	V-0
EP MP 21	Epoxy mica paper; electrical applications at high temperatures	100	60	30	11	30	100	-	5,2	-	0,04	155	2	1.5-1.8	
MF GC 21	Resistant to arcs and tracking	120	80	150	3,3	10	0,1	-	8	-	0,02	130	5	1.7-1.9	V-0
PF CC 21	Mechanical and electrical applications, fine weave	90	110	90	1,6	10	10	-	-	-	-	120	5	1.15-1.35	
PF CC 22	Mechanical and electrical applications, coarse weave	80	100	90	1,6	10	2	-	-	-	-	120	10	1.15-1.35	
PF CC 23	Mechanical applications, very coarse weave	80	100	90	1,6	8	0,5	-	-	-	-	120	13	1.15-1.35	
PF CC 24	Mechanical and electrical applications, very fine weave	100	120	100	1,6	10	2	-	-	-	-	120	5	1.15-1.35	
PF CP 21	Electrical and mechanical applications at low voltages	100	100	70	-	15	1	-	-	-	-	120		1.1-1.2	
PF CP 22	Electrical applications at high-voltage mains frequency	100	80	70	9,9	50 (2)	1	-	-	-	-	120		1.05-1.15	
PF CP 23	as type 21 but with better electrical properties	100	100	70	6,1	25	5	-	-	-	-	120		1.1-1.2	
PF GC 21	Very high mechanical strength at moderate temperatures	140	120	200	4,8	15	20	-	6	-	0,04	130		1.7-1.9	

Cylindrical rods made from industrial laminated materials

PF CC 41	Mechanical and electrical applications, fine weave	125	90	-	-	5	5	-	-	-	-	120	5	1.2-1.4	
PF CC 42	Mechanical and electrical applications, coarse weave	90	80	-	-	5	1	-	-	-	-	120	8	1.2-1.4	

(1) The flexural strength measured at 150°C ± 3K must not be less than 50% of the defined value
 (2) After 96 h pretreatment in air at 105°C ± 5K directly prior to testing and immediate immersion in the hot oil
 (3) At 90 °C in oil
 (4) 20 kV/3mm wall thickness in air
 (5)  UL-listed file E307596 under respective sheet designation

xxxx Minimum requirements of DIN EN 61212
 xxxxx Typical values, general recommended values, which must not be used as standard values

Resin	Substrate	Weave types for cotton substrate materials	Mass per unit area	No. of threads
EP Epoxy	CC Woven cotton cloth	Very coarse weave	> 200 g/m ²	< 18 per cm
MF Melamine	CP Cellulose paper	Coarse weave	> 130 g/m ²	18-29 per cm
PF Phenolic	GC Woven glass cloth	Fine weave	≤ 130 g/m ²	30-37 per cm
	MP Mica paper	Very fine weave	≤ 125 g/m ²	> 37 per cm