



STANDARD TYPES ACC. TO DIN EN 60893

Sheets made from industrial laminated materials (Part I)

Designation DIN EN 60893	Characteristic property Applications	Flexural strength	Elastic modulus from bending test	Compressive strength perpendicular	Impact strength Charpy or Izod	Shear strength parallel	Tensile strength	Dielectric strength perpendic. (3) thickness 3 mm	Dielectric strength parallel (3)	Permittivity 50 Hz	Permittivity 1 MHz	Dissipation factor 50 Hz	Dissipation factor 1MHz	Insulation resistance	PTI	CTI	Thermal endurance	Flammability	Density	Water absorption thickness 10 mm
DIN EN 60893-2		5.1	5.2	5.3	5.4.2 / 5.4.3	5.5	5.6	6.1.3.1	6.1.3.2	6.2	6.2	6.2	6.2	6.3	6.4	6.4	7.1	7.2	8.1	8.2
Unit		MPa	MPa	MPa	kJ/m ²	MPa	MPa	kV/mm	kV					MΩ			TI	cat.	g/cm ³	mg
min/max		min	min	min	min	min	min	min	min	max	max	max	max	min	min	min	min			max
EP CC 201	Epoxy-laminated cotton cloth, CTI 600, fine weave	135	6.000	230	6	10	100	5	35	5,3	5,3	0,04	0,04	1.000		600	130		1.2-1.4	149
EP CP 201	Epoxy-laminated cellulose paper, UL 94 V-0	110	6.000	160	-	-	80	13	35	5	5	0,05	0,05	10.000		100	110	V-0	1.3-1.4	-
EP PC 301	Epoxy-laminated polyester fibre cloth, SF6-resistant	140	3.000	200	55	12	135	10,2	45	5,3	5,3	0,05	0,05	100		380	130		1.2-1.4	220
EP GC 201	Electrical and mechanical applications, TC 130	340	22.000	350	42	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		200	130		1.8-2.0	34
EP GC 202	as type 201 but with combustibility acc. to UL 94 V-0 	340	22.000	350	42	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		200	130	V-0 (6)	1.8-2.0	34
EP GC 203	as type 201 but with TC 155	340 (1)	22.000	350	50	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		180	155		1.8-2.0	34
EP GC 204	as type 203 but with combustibility acc. to UL 94 V-0	340 (1)	22.000	350	50	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		180	155	V-0	1.8-2.0	34
EP GC 205	as type 203 but with heavyweight roving as substrate	340 (1)	24.000	350	70	20	300	9	45	5,5	5,5	0,04	0,04	10.000		180	155		1.8-2.0	34
EP GC 306	as type 203 but tracking-resistant, CTI 600	340 (1)	22.000	350	50	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000	500	600	155		1.8-2.0	34
EP GC 307	as type 306 but with heavyweight roving as substrate	340 (1)	24.000	350	70	20	300	9	45	5,5	5,5	0,04	0,04	10.000	500	600	155		1.8-2.0	34
EP GC 308	as type 203 but with TC 180	340 (1)	22.000	350	50	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		180	180		1.8-2.0	34
EP GC 309	as type 201 but with defined flexural strength at 130°C	340 (2)	22.000	350	42	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		200	130		1.8-2.0	34
EP GC 310	as type 202 but with zero-halogen flame retardant, V-0	340 (2)	22.000	350	42	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		200	130	V-0)	1.8-2.0	34
EP GC 311	as type 204 but with zero-halogen flame retardant, V-0	340 (1)	22.000	350	50	30	300	10,2	45	5,5	5,5	0,04	0,04	50.000		180	155	V-0)	1.8-2.0	34
MF CC 201	Resistant to arcs and tracking	70	5.000	90	3	8	60	4	15	8	8	0,03	0,03	10	500	500	130	V-0	1.3-1.5	305
MF GC 201	Resistant to arcs and tracking	240	14.000	275	35	12	150	5	15	7,5	7,5	0,02	0,02	100	500	500	130	V-0	1.8-2.0	414

(1) The flexural strength measured at 150°C ± 3K must not be less than 50% of the defined value
 (2) The flexural strength measured at 130°C ± 3K must not be less than 50% of the defined value
 (3) At 90 °C in oil
 (4) With zero-halogen flame retardant
 (5) After 96 h pretreatment in air at 105°C ± 5K directly prior to testing and immediate immersion in the hot oil
 (6)  UL- listed file E307596


xxxx Minimum requirements of DIN EN 60893
 xxxxx Typical values, general recommended values, which must not be used as standard values

Resin	Substrate	Weave types for polyester and cotton substrate materials	
EP Epoxy	CC Woven cotton cloth	Coarse weave	Mass per unit area > 130 g/m ² No. of threads ≤ 30 per cm
MF Melamine	CP Cellulose paper	Fine weave	≤ 130 g/m ² > 30 per cm
PF Phenolic	GC Woven glass cloth	Very fine weave	≤ 125 g/m ² > 38 per cm
	AC Acrylic cloth		

STANDARD TYPES ACC. TO DIN EN 60893

Sheets made from industrial laminated materials (Part II)

Designation DIN EN 60893	Characteristic property Applications	Flexural strength	Elastic modulus from bending test	Compressive strength perpendicular	Impact strength Charpy or Izod	Shear strength parallel	Tensile strength	Dielectric strength perpendic. (3) thickness 3 mm	Dielectric strength parallel (3)	Permittivity 50 Hz	Permittivity 1 MHz	Dissipation factor 50 Hz	Dissipation factor 1MHz	Insulation resistance	PTI	CTI	Thermal endurance	Flammability	Density	Water absorption thickness 10 mm
DIN EN 60893-2		5.1	5.2	5.3	5.4.2 / 5.4.3	5.5	5.6	6.1.3.1	6.1.3.2	6.2	6.2	6.2	6.2	6.3	6.4	6.4	7.1	7.2	8.1	8.2
Unit		MPa	MPa	MPa	kJ/m ²	MPa	MPa	kV/mm	kV					MΩ			TI	cat.	g/cm ³	mg
min/max		min	min	min	min	min	min	min	min	max	max	max	max	min	min	min	min			max
PF CP 201	Mechanical applications	135	7.000	300	-	10	120	-	-	-	-	-	-	-	-	100	120		1.3-1.4	920
PF CP 202	High-voltage grade for mains frequency in oil	120	7.000	300	-	10	100	13	60 (5)	-	5,5	-	0,05	-	-	100	120		1.3-1.4	550
PF CP 203	Electrical applications at normal humidity	120	7.000	250	-	10	100	8,4	15	-	5,5	-	0,05	50	-	100	105		1.3-1.4	320
PF CP 204	Stable electrical properties at high humidity	75	7.000	250	-	20	70	8,4	25	-	5,5	-	0,05	10.000	-	100	105		1.3-1.4	113
PF CP 205	as type 204 but with flame retardant, V-1	75	5.000	250	-	20	60	8,4	20	-	5,5	-	0,05	1.000	-	100	100	V-1	1.3-1.4	113
PF CP 206	Stable electrical properties at high humidity	85	7.000	250	-	20	70	7,7	25	-	6	-	0,05	1.000	-	100	105		1.3-1.4	149
PF CP 207	Cold-punching grade	80	5.000	300	-	10	100	-	-	-	-	-	-	-	-	100	105		1.3-1.4	920
PF CP 308	as type 206 but with flame retardant, V-1	85	7.000	250	-	20	70	7,7	25	-	6	-	0,05	1.000	-	100	100	V-1	1.3-1.4	149
PF CC 201	Mechanical applications, coarse weave	100	7.000	-	8	25	80	0,5	1	-	-	-	-	1	-	100	120		1.3-1.4	319
PF CC 202	Mechanical and electrical applications, coarse weave	90	7.000	-	7	20	60	3	20	5,5	-	-	-	50	-	100	120		1.3-1.4	209
PF CC 203	Mechanical applications, fine weave	110	7.000	-	7	25	85	0,5	1	-	-	-	-	1	-	100	120		1.3-1.4	319
PF CC 204	Mechanical and electrical applications, fine weave	100	7.000	-	6	20	80	4	20	5,5	-	-	-	50	-	100	120		1.3-1.4	209
PF CC 305	Mechanical and electrical applications, very fine weave	125	7.000	-	6	20	80	0,89	1	-	-	-	-	1	-	100	120		1.3-1.4	319
PF GC 201	Phenolic-laminated glass cloth	140	14.000	-	30	-	100	5,7	20	5	-	-	-	100	-	100	120		1.6-1.8	310

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