

Table 4.15 **Fluororesin characteristics list (representative values)**

Characteristic	Unit	Test method			PTFE	PFA	FEP	PCTFE	ETFE	ECTFE	PVDF	PVF
Melting point	°C	JIS K 6935	ISO 12086	ASTM D 4591	327	310	260	220	270	245	151-178	203
Density	g/cm ³	K 7112	1183	D 792	2.13-2.20	2.12-2.17	2.15-2.17	2.10-2.20	1.73-1.74	1.68-1.69	1.75-1.78	1.38-1.57
Tensile strength	MPa	K 7162	527	D 638	20-35	25-35	20-30	31-41	38-42	41-48	30-70	(82)
Elongation	□	Same above			200-400	300-350	250-330	80-250	300-400	200-300	20-370	115-250
Compressive strength	MPa [10□Deformation]	K 7181	604	D 695	10-15	15-20	14-19	31-51	40-50	35-40	32-74	□
Izod impact strength	J/m	K 7110	180	D 256	150-160	non breaking	non breaking	135-145	non breaking	non breaking	160-375	□
Rockwell hardness	[R scale]	K 7202	2039	D 785	R20	R50	R50	R80	R50	R50	R93-116	□
Shore hardness	[D scale]	K 7215	868	D 2240	D50-55	D62-66	D60-65	D75-80	D67-78	D53-57	D64-79	□
Flexural modulus	GPa	K 7171	178	D 790	0.53-0.58	0.54-0.64	0.55-0.67	1.25-1.79	0.90-1.20	0.66-0.69	0.60-1.99	□
Tensile modulus	GPa	K 7161	527	D 638	0.40-0.60	0.31-0.35	0.32-0.36	1.03-2.10	0.70-0.85	1.55-1.70	0.37-2.58	(1.9)
Dynamic friction	[0.69MPa, 3m/min]	K 6935		D 1894	0.1	0.2	0.3	0.4	0.4	0.4	0.4	□
Thermal conductivity	W/m□K	A 1412	8302	C 177	0.23	0.19	0.2	0.22	0.24	0.16	0.17	0.14-0.17
Specific heat	10 ³ J/kg□K	K 7123			1.0	1.0	1.2	0.9	2.0	2.0	1.2	1.0
Coefficient of linear expansion	10 ⁻⁵ / K (-30°C□+30°C)			D 696	10	12	9	6	6	8	16	7.1-7.8
Ball pressure temperature	°C	Compliance with the Report on Registration System for Thermoplastic Ball Pressure Used in Electrical Appliances			180	230	170	170	185	180	150	□
Deflection temperature under load	°C [1.81MPa] [0.45MPa]	K 7191	75	D 648	55 120	47 74	50 72	90 126	74 104	77 116	100 156	□
Maximum operating temperature (continuous)	°C	K 7226	2578		260	260	200	120	150	150	150	100
Volume resistivity	Ω□cm[50%RH,23°C]	K 6911	IEC 60093	D 257	>10 ¹⁸	>10 ¹⁸	>10 ¹⁸	>10 ¹⁸	>10 ¹⁷	>10 ¹⁵	>10 ¹⁵	>10 ¹⁴
Dielectric strength (short term)	MV/m [3.2mm Thickness]	K 6935	IEC 60243	D 149	19	20	22	22	16	20	11	□
Dielectric constant	[60Hz]	K 6935	IEC 60250	D 150	2.1	2.1	2.1	2.6	2.6	2.6	8.4	8.2-8.5
	[10 ³ Hz]				2.1	2.1	2.1	2.6	2.6	2.6	7.7	6.2-6.7
	[10 ⁶ Hz]				2.1	2.1	2.1	2.6	2.6	2.6	6.4	6.2-7.0
Loss tangent	[60Hz]	K 6935	IEC 60250	D 150	0.0002	0.0002	0.0002	0.0012	0.0006	0.0005	0.049	□
	[10 ³ Hz]				0.0002	0.0002	0.0002	0.025	0.0008	0.0015	0.018	0.3
	[10 ⁶ Hz]				0.0002	0.0003	0.0005	0.020	0.005	0.015	0.017	□
Arc resistance	sec			D 495	>300	>300	>300	>300	75	18	60	□
Water absorption rate	□[24hr]	K 7209	62	D 570	0.01	0.01	0.01	0.01	0.03	0.01	0.03	<0.5
Flame retardance	[3.2□ Thickness]	K 7140	1210	UL-94	V-0	V-0	V-0	V-0	V-0	V-0	V-0	HB
Limiting Oxygen Index (LOI)		K 6935	4589	D 2863	>95	>95	>95	>95	32	60	43	23
Effects of direct sunlight					Non	Non	Non	Non	Non	Non	Non	Non
Chemical resistance				D 543								
acid					S.E	S.E	S.E	E	V.G	E	E	G
alkali					S.E	S.E	S.E	E	V.G	E	V.G	V.G
Organic solvent					S.E	S.E	S.E	V.G	V.G	E	G	G

Super Excellent(S.E): Not attacked by most chemicals and solvents even under harsh conditions.

Excellent(E): Some chemicals and solvents need to be used under specific conditions.

Very good(V.G): It is necessary to examine the chemicals, solvents, and conditions of use in detail.

Good(G): Dissolves in some solvents.

Remark: The values in parentheses are the test conditions.