

Table 1 Summary of typical properties standard SP polyimide resins

Property	Temp. °C	ASTM Method	Units	SP1		SP21		SP22		SP211		SP3
				M	DF	M	DF	M	DF	M	DF	M
Tensile strength, ultimate	23	D1708	MPa	86,2	72,4	65,5	62,0	51,7	48,3	44,8	51,7	58,5
	260	E81		41,4	36,5	37,9	30,3	23,4	26,2	24,1	24,1	
Elongation, ultimate	23	D1708	%	7,5	7,5	4,5	5,5	3,0	2,5	3,5	5,5	4,0
	260	E81		6,0	7,0	3,0	5,2	2,0	2,0	3,0	5,3	-
Flexural strength, ultimate	23	D790	MPa	110,3	82,7	110,3	82,7	89,6	62,1	68,9	68,9	75,8
	260			62,1	44,8	62,0	48,3	44,8	37,9	34,5	34,5	39,9
Flexural modulus	23	D790	MPa	3102	2482	3792	3171	4826	4826	3102	2758	3275
	260			1724	1448	2551	1792	2758	2758	1379	1379	1862
Compressive stress at 1% strain at 10% strain at 0,1% offset	23	D695	MPa	24,8	24,1*	29,0	22,8*	31,7	24,1	20,7	14,5*	34,5
				133,1	112,4*	133,1	104,8*	112,4	93,8*	102,0	75,8*	127,6
				51,0	33,1*	45,5	33,8*	41,4	25,5*	37,2	27,6*	
Compressive modulus	23	D695	MPa	2413	2413*	2895	2275*	3275	2654*	2068	1379*	2413
Axial fatigue, Endurance limit at 10 ⁷ cycles at 10 ⁷ cycles	23		MPa	55,8		46,2	-	-	-	-	-	-
				260	26,2	22,8	-	-	-	-	-	-
	23			42,1	32,4	-	-	-	-	-		
				260	16,5	16,5	-	-	-	-	-	-
Flexural fatigue, Endurance limit at 10 ⁷ cycles at 10 ⁷ cycles	23		MPa	65,5		65,5	-	-	-	-	-	-
				44,8	44,8	-	-	-	-	-		
23	44,8			44,8	-	-	-	-	-			
	23			44,8	44,8	-	-	-	-	-		
Shear strength	23	D732	MPa	89,6		77,2						
Impact strength, Izod, notched	23	D256	J/m	42,7		42,7						21,3
Impact strength, Izod, unnotched	23	D256	J/m	747		320						112
Poisson's ratio	23			0,41		0,41						

MECHANICAL

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Property	Temp. °C	ASTM Method	Units	SP1		SP21		SP22		SP211		SP3
				M	DF	M	DF	M	DF	M	DF	M
Coefficient of linear thermal expansion	23 to 260 -62 to +23	D696	µm/m/°C	54	50 45	49	41 34	38	27	54	41	52
Thermal conductivity	40		W/m · °C	0.35	0.29*	0.87	0.46*	1.73	0.89*	0.76	0.42*	0.47
Specific heat			J/kg/°C	1130								
Deformation under 14 MPa load	50	D621	%	0.14	0.20	0.10	0.17	0.08	0.14	0.13	0.29	0.12
Deflection temperature at 2 MPa		D648	°C	-360		-360						

THERMAL

Table 2 Summary of typical properties standard SP polyimide resins

Property	Temp. °C	ASTM Method	Units	SP1		SP21		SP22		SP211		SP3
				M	DF	M	DF	M	DF	M	DF	M
Dielectric constant	23	D150										
at 102 Hz				3.62	-	13.53	-	-	-	-	-	-
at 104 Hz				3.64	-	13.28	-	-	-	-	-	-
at 106 Hz				3.55	-	13.41	-	-	-	-	-	-
Dissipation factor	23	D150										
at 102 Hz				0.0018	-	0.0053	-	-	-	-	-	-
at 104 Hz				0.0036	-	0.0067	-	-	-	-	-	-
at 106 Hz				0.0034	-	0.0106	-	-	-	-	-	-
Dielectric strength short time 2 mm thick		D149	MV/m	22	-	9.84	-	-	-	-	-	-
Volume resistivity	23	D257	Ω · m	10 ¹⁴ -10 ¹⁵	-	10 ¹² -10 ¹³	-	-	-	-	-	-
Surface resistivity	23	D257	Ω	10 ¹⁵ -10 ¹⁶	-	-	-	-	-	-	-	-

ELECTRICAL

Table 1 Summary of typical properties standard SP polyimide resins

Property	Temp. °C	ASTM Method	Units	SP1		SP21		SP22		SP211		SP3
				M	DF	M	DF	M	DF	M	DF	M
Wear rate I1			m/s × 10 ⁻¹⁰	17-85	17-85	6.3	6.3	4.2	4.2	4.9	4.9	17-23
Coefficient of friction** PV = 0,875 MPa·m/s				0.29	0.29	0.24	0.24	0.30	0.30	0.12	0.12	0.25
PV = 3,5 MPa·m/s				-	-	0.12	0.12	0.09	0.09	0.08	0.08	0.17
In vacuum				-	-	-	-	-	-	-	-	0.03
Static in air				0.35	-	0.30	-	0.27	-	0.20	-	-

WEAR AND FRICTION