Physical Properties of Takiron Polymer Products

Evaluation Items		Material	Monomer Cast Nylon			Nylon (PA)	POM	Crystalline PET TP-PEX		Ultra-High Molecular Weight Polyethylene Ulmolar			High-Density Polyethylene			Vinylidene Fluoride		Testing Methods
		Grades	Standard	Sliding	High sliding	Conductive	Standard	Standard		Standard	For food production	Low friction	Standard	Standard	For food production	Standard	Standard	
		Product Number / Unit	MCN N550/ N350 MCN Rod 550/350	MCN N950 MCN Rod 950	MCN N050 MCN Rod 050	PA 910CV	POM 760 POM Rod 760	PEX C777 PEX Rod 777/778/977		UP 140 UP Rod 140	UP 542	UP 143SL	PE 721	PE Rod 730	PE 520 PE Rod 530	PVDF F2 PVDF Rod F2	PVDF F10	
Physical Properties	Specific Gravity	–	1.16	1.17	1.13	1.26	1.41	1.41		0.94	0.94	0.94	0.97	0.97	0.97	1.78	1.78	JIS K 7112
	Rockwell Hardness	M Scale	93	88	52	—	78	95		—	—	—	—	—	—	71	—	JIS K 7202
		R Scale	119	116	107	—	118	123		62	57	57	80	—	69	116	118	
Mechanical Properties	Tensile Yield Stress	MPa	90	85	59	61	65	91		23	20	20	31	30	30	57	58	JIS K 7161-2-1B/50
	Nominal Tensile Strain at Break	%	17	20	10	4	60	9		150 or more	250 or more	239	102	250 or more	250 or more	20	24	
	Tensile Elasticity	MPa	3800	3500	2800	—	3000	3600		1000	—	—	2200	—	1500	2100	—	JIS K7162-1B/1
	Charpy Impact Strength	KJ/m^2	3.8	3.1	5.8	3.1	8.2	2.9		No fracture	No fracture	No fracture	47	42.6	17.0	7.8	16.4	JIS K7111-1eA
	Flexural Stress	MPa	110	95	85	100	94	129		23	19	21	38	33	31	67	72	JIS K7171
	Flexural Elasticity	MPa	3300	2700	2400	3000	3000	3600		900	800	900	2100	1600	1600	2100	2000	JIS K7171
	Compressive Yield Stress	MPa	96	87	68	79	78	111		16	19	24	27	—	26	76	63	JIS K 7181-B/5
	Compressive Elasticity	MPa	3000	2700	1700	3200	2700	3100		700	600	700	1000	—	1000	1400	1800	JIS K 7181-A/1
Thermal Properties	Deflection Temperature under Load	℃ 0.45MPa	218	218	218	—	164	210		79	82	87	58	—	90	117	—	JIS K 7191
		℃ 1.80MPa	218	218	213	187	132	89		48	61	61	98	—	51	70	105	
	Vicat Softening Temperature	℃ Method A (10 N)	218	218	216	—	166	243		135	135	137	132	—	130	166	168	JIS K 7206
		℃ Method B (50 N)	218	218	204	200	152	204		82	89	90	77	81	78	135	140	
	Continuous Operating Temperature	℃	120	120	100	100	90	100		80	80	80	80	80	80	100	100	–
	Linear Thermal Expansion Coefficient	$\times10^{-5}\cdot K^{-1}$	8.7	8.7	11.1	—	10.2	7.4		15.5	17.5	—	12.2	—	12.6	12.9	—	JIS K 7197
	Thermal Conductivity	W/m·K	0.38	0.38	0.38	—	0.16	0.30		0.39	—	—	—	—	—	0.21	—	Laser flash method
	Specific Heat Capacity	J/g·K	1.81	1.81	1.81	—	2.21	0.77		2.28	—	—	—	—	—	1.41	—	JIS K 7123
	Flame Resistance	–	Self-extinguishing	Self-extinguishing	Self-extinguishing	Self-extinguishing	Flammable	Self-extinguishing		Flammable	Flammable	Flammable	Flammable	Flammable	Flammable	Self-extinguishing	Self-extinguishing	JIS K 6911
Electrical Properties	Surface Resistivity	Ω/□	10^{15}	10^{15}	10^{15}	10^5〜10^7	10^{15} or more	10^{15} or more		10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	JIS K 6911
	Volume Resistivity	Ω·m	10^{13}	10^{13}	10^{13}	10^3〜10^5	10^{13} or more	10^{13} or more		10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	JIS K 6911
	Breakdown Strength	MV/m	17	17	17	Unmeasurable	21	14		24	—	—	—	—	—	15	—	JIS K 6911
	Permittivity (1 MHz)	–	3.4	3.4	3.4	Unmeasurable	3.7	3.3		2.0	—	—	—	—	—	6.3	—	JIS K 6911
	Dissipation Factor (1 MHz)	–	0.017	0.017	0.017	Unmeasurable	0.006	0.018		0.001	—	—	—	—	—	0.160	—	JIS K 6911
Other	Water Absorption	%	0.30	0.32	0.47	—	—	0.04		Under 0.01	—	—	Under 0.01	Under 0.01	Under 0.01	0.01	—	JIS K 7209
	Hue (Color)	–	Blue/Natural	Black	Gray	Black	Natural	White/Black		Natural	Blue	Natural	Natural	Natural	Blue	Natural	Natural	–

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.

Physical Properties

Takiron Polymer Products

Physical Properties of Takiron Polymer Products

Evaluation Items		Material	PMP	Polypropylene						Polypropylene	PEEK	PPS	Polycarbonate			PC/ABS	Testing Methods
		Grades	Standard	Standard	Standard	For food production	High heat-resistant	Conductive		30% glass	Standard	Standard	Standard	20% glass	20% glass	Flame-retardant	
		Product Number / Unit	PMP M600 PMP Rod 600	PP P370 PP Rod 370	PP 975	PP 570 PP Rod 570	PP 922	PP P973CV		PP 90G30	PEEK 810 PEEK Rod 810	PPS 800	PCET 1600/1900	PCET GF20	PC 91G20	PCABS 2900	
Physical Properties	Specific Gravity	–	0.83	0.91	0.91	0.91	0.92	0.97		1.13	1.32	1.34	1.20	1.34	1.34	1.18	JIS K 7112
	Rockwell Hardness	M Scale	—	62	62	62	—	—		52	102	—	67	—	—	75	JIS K 7202
		R Scale	97	103	103	103	112	97		108	126	—	125	—	123	120	
Mechanical Properties	Tensile Yield Stress	MPa	28	34	34	34	35	22		34	107	80	70	59/96*	65/84*	55	JIS K 7161-2-1B/50
	Nominal Tensile Strain at Break	%	24	33	33	33	31	6		5	17	3	63	4/4*	4/5*	10	
	Tensile Elasticity	MPa	—	1800	1800	1800	—	2800		—	—	3400	2300	2700/3900*	—	2900	JIS K7162-1B/1
	Charpy Impact Strength	KJ/m^2	0.7	8.1	8.1	8.1	15.0	4.8		4.5	4.1	2.7	12.0	4.6/5.9*	3.3/7.0	3.4	JIS K7111-1eA
	Flexural Stress	MPa	37	40	40	40	58	40		57	162	133	93	93/136*	122/130*	105	JIS K7171
	Flexural Elasticity	MPa	1300	1400	1400	1400	2200	2500		2800	3800	4300	2300	3800/6000*	3600/3700*	3000	JIS K7171
	Compressive Yield Stress	MPa	44	54	54	54	57	52		—	119	124	85	64/103*	89/106*	90	JIS K 7181-B/5
	Compressive Elasticity	MPa	1100	1200	1200	1200	2100	1200		—	3500	3400	—	2600/3000*	3100/3300*	2060	JIS K 7181-A/1
Thermal Properties	Deflection Temperature under Load	℃ 0.45MPa	203	129	129	129	159	159		139	—	—	154	—	141/141*	100	JIS K 7191
		℃ 1.80MPa	117	73	73	73	101	80		84	163	130	151	137/140*	140/140*	96	
	Vicat Softening Temperature	℃ Method A (10 N)	—	143	143	143	—	163		—	—	—	157	150	156	105	JIS K 7206
		℃ Method B (50 N)	—	99	99	99	121	105		—	—	—	152	143	145	104	
	Continuous Operating Temperature	℃	120	100	100	100	110	100		100	260	220	120	120	120	80	–
	Linear Thermal Expansion Coefficient	$\times10^{-5}\cdot K^{-1}$	11.7	11.1	11.1	11.1	—	—		9.3	5.8	—	6.5	3.3/5.2*	3.9/5.8*	7.6	JIS K 7197
	Thermal Conductivity	W/m·K	—	0.28	0.28	0.28	—	—		—	—	—	0.19	—	—	—	Laser flash method
	Specific Heat Capacity	J/g·K	—	2.05	2.05	2.05	—	—		—	—	—	1.30	—	—	1.30	JIS K 7123
	Flame Resistance	–	Flammable	Flammable	Flammable	Flammable	Flammable	Flammable		Flammable	Self-extinguishing	—	Self-extinguishing	Self-extinguishing	Self-extinguishing	Self-extinguishing	JIS K 6911
Electrical Properties	Surface Resistivity	Ω/□	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	$10^{2}\sim10^{4}$		10^{15} or more	10^{15} or more	—	10^{15} or more	10^{15} or more	10^{15} or more	10^{15} or more	JIS K 6911
	Volume Resistivity	Ω·m	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	$10^{0}\sim10^{2}$		10^{13} or more	10^{13} or more	—	10^{13} or more	10^{13} or more	10^{13} or more	10^{13} or more	JIS K 6911
	Breakdown Strength	MV/m	32	24	24	24	—	Unmeasurable		—	20	—	20	—	—	19	JIS K 6911
	Permittivity (1 MHz)	–	2.1	2.4	2.4	2.4	—	Unmeasurable		—	2.8	—	3.0	—	—	3.0	JIS K 6911
	Dissipation Factor (1 MHz)	–	Under 0.001	0.002	0.002	0.002	—	Unmeasurable		—	0.005	—	0.009	—	—	0.008	JIS K 6911
Other	Water Absorption	%	Under 0.01	Under 0.01	Under 0.01	Under 0.01	—	0.05		—	—	—	0.24	—	—	0.05	JIS K 7209
	Hue (Color)	–	Transparent	Natural	Black	Blue	Dark gray	Black		Black	Beige	Natural	Transparent/ Black	Black	Black	Black	–

• The above data are a series of test results for a 5 mm thick specimen and given here without guarantee.
*: Specimen orientation (MD/TD)

Takiron Polymer Products
Physical Properties