

MATERIALS COMPARISON MATRIX

SLA	METRIC		9120	Polypropylene	11122	Transparent ABS	18420	DMX	Nanotool	Tango		
	ASTM Method	Description								Units	Black	Gray
D638M		Tensile Strength	MPa	30 to 32	31 to 37,2	47,1 to 53,6	45.7	42,2 to 43,8	29,7 to 32,1	61,7 to 78	2	4.36
		Elongation at Break	%	—	—	11 to 20	41.6	8 to 16	12 to 28	0,7 to 1	47.7	47
		Elongation at Yield	%	15 to 25	7 to 13	3,3 to 3,5	—	—	3,3 to 3,7	—	X	X
		Modulus of Elasticity	MPa	1227 to 1455	1138 to 1551	2650 to 2880	2000	2180 to 2310	2,256 to 2,559	11000 to 11400	—	—
		Poisson's Ratio	—	—	—	—	—	0,43 to 0,45	0,40 to 0,42	0,34 to 0,38	—	—
D790M		Flexural Strength	MPa	41 to 46	41 to 55	63,1 to 74,2	73.5	66,7 to 70,5	68	79 to 121	—	—
		Flexural Modulus	MPa	1310 to 1455	1172 to 1724	2040 to 2370	2300	1990 to 2130	2282 to 2298	10200 to 10800	—	—
D256A		Izod Impact-Notched	J/m	48 to 53	21 to 75	20 to 30	160	20 to 22	61 to 71	0,12 to 0,15	—	—
D2240		Shore Hardness	—	80 to 82D	—	—	—	86 to 88D	80D	94D	61A	75A
D542		Index of Refraction	—	—	1,512 to 1,515	1.52	—	—	—	—	—	—
D624		Tear Strength	S.I	—	—	—	—	1.1	—	—	3.8	9.5
D1004		Graves Tear	N/m	—	—	150,288	—	123,000	—	—	—	—
D570-98		Water Absorption	%	—	—	0.35	0,2 to 0,45	0.68	0,82 to 0,85	0.23	—	—
E831-00		Thermal expansion Coefficient -40° to 0°	µm/m-°C	—	—	66 to 67	—	74,6 to 75,5	83,8 to 85,2	25,3 to 26	—	—
		Thermal Expansion Coefficient 0° to 50°	µm/m-°C	—	—	90 to 96	—	101,2 to 110,3	124 to 134,1	30,4 to 32,4	—	—
		Thermal Expansion Coefficient 50° to 100°	µm/m-°C	—	—	170 to 189	60 to 130	114,4 to 135,8	181,2 to 185,3	75,9 to 87,4	—	—
		Thermal Expansion Coefficient 100° to 150°	µm/m-°C	—	—	185 to 189	—	129,5 to 138,1	178,4 to 179,9	90 to 95,7	—	—
D150-98		Dielectric Constant at 60Hz	—	—	—	3,9 to 4,1	3.7	3,5 to 3,6	4,2 to 4,5	4	—	—
		Dielectric Constant at 1KHz	—	—	—	3,7 to 3,9	—	3,4 to 3,5	3,8 to 4,1	3.9	—	—
		Dielectric Constant at 1MHz	—	—	—	3,4 to 3,5	3.7	3,1 to 3,3	3,6 to 3,8	3.6	—	—
D149-97a		Dielectric Strength	kV/mm	—	—	15,4 to 16,3	13,8 to 19,7	13,2 to 14,2	14.1 to 15.8	15,6 to 16,8	—	—
E1545-00		Glass Transition temp (Tg)	°C	—	—	39 to 46	—	57 to 59	37	57 to 62	-10,7	2.6
D648-98c		Heat Deflection temp @ 0,46 Mpa	°C	52 to 61	107 to 121	45,9 to 54,5	94 to 207	53 to 56	43 to 45	225	—	—
		Heat Deflection temp @ 1,81 Mpa	°C	—	—	49 to 49,7	86,4 to 194	46 to 47	41	85 to 90	—	—

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SLS	METRIC		DuraForm PA	Nylon 6 Unreinforced	ALM FR-106	Nylon 11	ALM RM250	Nylon 12	A6 Steel	Acier AISI 9260
Method	Description	Units								
ASTM D4164	Density	g/cm ³	0.59	1 to 1,58	—	1 to 1,05	—	—	7.8	7.85
Diffraction Laser	Particle size d50	µm	58	—	95	—	40 to 50	4 to 63	—	—
Diffraction Laser	Particule size @ 90%	µm	25 to 92	—	—	—	—	—	—	—
ASTM D792	Spécific gravity @ 20°C	g/cm ³	0.97	0,425 to 0,8	1.07	—	0.98	0,215 to 0,425	—	—
ASTM D570	Moisture absorption @ 20°C	%	—	—	—	—	—	—	—	—
ASTM D570	Moisture Absorption @ 23°C, 65% HR	%	0.41	3	—	—	—	—	—	—
ASTM D482	ash content	%	—	—	—	—	—	—	—	—
ASTM D3418	Glass temperature	°C	—	—	—	—	—	—	—	—
DSC	Melting point	°C	184	141 to 255	186	175 to 191	182	125 to 310	—	—
	Melting point, wax	°C	—	—	—	—	—	—	—	—
ASTM D648	Deflection temperature @ 0,45 Mpa	°C	177	42 to 213	—	—	—	—	—	—
ASTM D648	Deflection temperature @ 1,82 Mpa	°C	86	32 to 230	86	40 to 55	—	—	—	—
Vase ouvert Cleveland	Point of ignition Polystyrene	°C	—	—	—	—	—	—	—	—
	Point of ignition wax	°C	—	—	—	—	—	—	—	—
	Spontaneous Combution Point	°C	—	—	—	—	—	—	—	—
ASTM D638	tensile strenght	MPa	44	3,45 to 221	39 to 46	15 to 44	36 to 46	13 to 614	470	440 to 1525
ASTM D638	Tensile modulus	MPa	1600	140 to 11000	1345	—	1740	9,5 to 64100	138000	200000
ASTM D790	Flexural modulus @ 23°C	MPa	1285	76 to 2780	—	—	—	—	—	—
ASTM D638	Elongation at break	%	9	1,5 to 500	21 to 38	30 to 400	4 to 16	0,35 to 500	2 to 4	11 to 22
ASTM D624	Tear Strength Matrix C at 23°C	Kn/m	—	—	—	—	—	—	—	—
ASTM D 4069	R to abrasion Taber,Millstone CS-17, under 1kg (1000 cycles)	mg	—	—	—	—	—	—	—	—
	Resistance to the outbreak (straight) @ 23°C	PSI	—	—	—	—	—	—	—	—
ASTM D256	Izod Impact:	—	—	—	—	—	—	—	—	—
	notched	J/m	214	0,45 to 534000	—	—	—	—	—	—
	unnotched	J/m	428	534	—	—	—	—	—	—
	State surface without post-processing (Ra)	µm	8.5	—	—	—	9	—	—	—
	State surface after post-processing (Ra)	µm	0.13	—	—	—	—	—	—	—
ASTM D2240	Hardness Shore A @ 23°C	—	—	—	—	—	—	—	—	—
ASTM D257-93	Transverse resistivity @ 22°C, 500V	Ohms x cm	3,1x10 ¹⁴	—	—	—	—	—	—	—
ASTM D257-93	Surface Resistivity @ 22°C, 500V	Ohms x cm	3x10 ¹⁴	—	—	—	—	—	—	—
D150-95	Dielectric constant @ 22°C, 5V, 1000 Hz	—	2.9	3,3 to 7	—	—	—	—	—	—
D149-95a	Dielectric strength @ 22°C, 50% VR, In the air , 5V V/Sec	V/mm	16000	13500 to 16300	—	—	—	—	—	—

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