

LLumar Safety and Security Film Physical Properties



	FILM THICKNESS (inches)	APPEARANCE	FILM STRUCTURE	TENSILE STRENGTH (as constructed)	TENSILE STRENGTH (average as reported by polyester supplier)	BREAK STRENGTH (peak load)	BREAK STRENGTH (average load)	ELONGATION AT BREAK	PEEL STRENGTH	PUNCTURE STRENGTH
SCL SR PS2	0.002	Clear	Single	28,000	32,000	56	56	> 100%	>2720 (>6)	45
SCL SR PS4	0.004	Clear	Single	34,555	32,000	135	133	> 100%	>2720 (>6)	70
SCL SR PS6	0.006	Clear	Multi	28,900	32,000	181	173	> 100%	>2720 (>6)	111
SCL SR PS7	0.007	Clear	Single	31,050	32,000	230	211	> 100%	>2720 (>6)	145
SCL SR PS8	0.008	Clear	Multi	31,071	32,000	266	254	> 100%	>2720 (>6)	156
SCL SR PS11	0.011	Clear	Multi	26,971	32,000	324	309	> 100%	>2720 (>6)	187
SCL SR PS15	0.015	Clear	Multi	26,323	32,000	472	395	> 100%	>2720 (>6)	223
R-20 SR PS4	0.004	Silver Reflective	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
R-35 SR PS4	0.004	Silver Reflective	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
R-20 SR PS8	0.008	Silver Reflective	Multi	32,473	32,000	269	260	> 100%	>2720 (>6)	164
N-1020 SR PS4	0.004	Dark Neutral	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
N-1040 SR PS4	0.004	Medium Neutral	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
N-1050 SR PS4	0.004	Light Neutral	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
NUV-65 SR PS4	0.004	Very Light Neutral	Multi	33,884	32,000	120	119	> 100%	>2720 (>6)	78
N-1020 SR PS8	0.008	Dark Neutral	Multi	32,473	32,000	269	260	> 100%	>2720 (>6)	164
N-1040 SR PS8	0.008	Medium Neutral	Multi	32,473	32,000	269	260	> 100%	>2720 (>6)	164
N-1050 SR PS8	0.008	Light Neutral	Multi	32,473	32,000	269	260	> 100%	>2720 (>6)	164
SCL ER PS4	0.004	Clear	Single	34,555	32,000	135	133	> 100%	>2720 (>6)	70

PROPERTIES	TEST METHOD	UNITS
Tensile Strength	ASTM D882	PSI - Pounds per square inch
Break Strength	ASTM D882	lbf/in - Pounds force per inch width
Elongation at Break	ASTM D882	% - Percent
Peel Strength	ASTM D3330	g/in (lbf/in) - Grams per inch width (pounds per inch width)
Puncture Strength	ASTM D4830	lbf - Pounds force

All LLumar Safety Films comply with ANSI Z97.1 impact test requirements on 1/8" and 1/4" glass.

All Clear Safety Films comply with CPSC 16CFR1201 Cat II impact requirements on 1/8" glass.

SCL SR PS7, SCL SR PS8, SCL SR PS11 and SCL SR PS15 comply with CPSC 16CFR1201 Cat II impact requirements on 1/4" glass.

LLumar films with a Scratch Resistant coating (SR in film name) tested using ASTM D-1044, using 500g weights and CS-10F wheel have shown less than 5% increase in haze after abrasion.

All LLumar Safety Films utilize an acrylic pressure sensitive adhesive system.

Data values are typical and provided for comparison purposes only.

LLumar Safety and Security Film Physical Properties



	FILM THICKNESS (microns)	APPEARANCE	FILM STRUCTURE	TENSILE STRENGTH (as constructed)	TENSILE STRENGTH (average as reported by polyester supplier)	BREAK STRENGTH (peak load)	BREAK STRENGTH (average load)	ELONGATION AT BREAK	PEEL STRENGTH	PUNCTURE STRENGTH
SCL SR PS2	50	Clear	Single	193	221	9.8	9.8	> 100%	>2.72	200
SCL SR PS4	100	Clear	Single	238	221	23.6	23.3	> 100%	>2.72	351
SCL SR PS6	150	Clear	Multi	199	221	31.7	30.3	> 100%	>2.72	494
SCL SR PS7	175	Clear	Single	214	221	40.3	36.9	> 100%	>2.72	645
SCL SR PS8	200	Clear	Multi	214	221	46.6	44.5	> 100%	>2.72	694
SCL SR PS11	275	Clear	Multi	186	221	56.7	54.1	> 100%	>2.72	832
SCL SR PS15	375	Clear	Multi	181	221	82.6	69.2	> 100%	>2.72	992
R-20 SR PS4	100	Silver Reflective	Multi	234	221	21.0	20.8	> 100%	>2.72	347
R-35 SR PS4	100	Silver Reflective	Multi	234	221	21.0	20.8	> 100%	>2.72	347
R-20 SR PS8	200	Silver Reflective	Multi	224	221	47.1	45.5	> 100%	>2.72	730
N-1020 SR PS4	100	Dark Neutral	Multi	234	221	21.0	20.8	> 100%	>2.72	347
N-1040 SR PS4	100	Medium Neutral	Multi	234	221	21.0	20.8	> 100%	>2.72	347
N-1050 SR PS4	100	Light Neutral	Multi	234	221	21.0	20.8	> 100%	>2.72	347
NUV-65 SR PS4	100	Very Light Neutral	Multi	234	221	21.0	20.8	> 100%	>2.72	347
N-1020 SR PS8	200	Dark Neutral	Multi	224	221	47.1	45.5	> 100%	>2.72	730
N-1040 SR PS8	200	Medium Neutral	Multi	224	221	47.1	45.5	> 100%	>2.72	730
N-1050 SR PS8	200	Light Neutral	Multi	224	221	47.1	45.5	> 100%	>2.72	730
SCL ER PS4	100	Clear	Single	234	221	21.0	20.8	> 100%	>2.72	347

PROPERTIES	TEST METHOD	UNITS
Tensile Strength	ASTM D882	Mpa (or MN/m ²) - Mega Pascal
Break Strength	ASTM D882	KN/m - Kilo Newton per meter
Elongation at Break	ASTM D882	% - Percent
Peel Strength	ASTM D3330	Kgf/25mm - Kilogram force per 25 mm width
Puncture Strength	ASTM D4830	N - Newton

All LLumar Safety Films comply with ANSI Z97.1 impact test requirements on 1/8" and 1/4" glass.

All Clear Safety Films comply with CPSC 16CFR1201 Cat II impact requirements on 1/8" glass.

SCL SR PS7, SCL SR PS8, SCL SR PS11 and SCL SR PS15 comply with CPSC 16CFR1201 Cat II impact requirements on 1/4" glass.

LLumar films with a Scratch Resistant coating (SR in film name) tested using ASTM D-1044, using 500g weights and CS-10F wheel have shown less than 5% increase in haze after abrasion.

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