

technical data sheet updated 08-2024

Flat glass films	finish hardcoat	area of application	thick- ness ca. (µ)	reference number	total solar energy			visible light		Ultraviolet transmittance UV 300 - 380 nm (%)	total energy rejected (%)	g-value	recommended combination with a glass type (* *)
					transmitted (%)	reflected (%)	absorbed (%)	transmitted (%)	reflected internal / external (%)				
<b>sun protection film - interior use</b>													
silver dark 20R sr ** (C*)	sr	interior	50	30000 30000-1829	11	53	36	15	61	<0,01	79	0,20	1/2
silver medium 35R sr ** (C*)	sr	interior	50	30100	21	40	38	29	45	<0,01	69	0,31	1/2
brillant light 70NR sr	sr	interior	50	31105	49	27	24	70	15	<1	49	0,50	1/2
imperial light 65S sr	sr	interior	50	31100	42	28	30	60	19	<1	50	0,49	1/2
one way mirror film dark 7R sr **	sr	interior	50	30360	12	54	34	8	12/52	<1	80	0,19	1/2
<b>sun protection film - exterior use</b>													
silver dark 20R **		exterior	50	30020	13	65	22	18	63	<1	81	0,18	1/2/3/4/5
silver dark 20R Primus Plus (C*)	sr	exterior	70	30150	11	63	26	15	64	<0,01	82	0,17	1/2/3/4/5
silver medium 35R Primus Plus (C*)	sr	exterior	70	30155	21	49	30	29	48	<0,01	71	0,29	1/2/3/4/5
silver light 50R Primus Plus (C*)	sr	exterior	70	30180	40	26	34	53	24	<0,01	51	0,49	1/2/3/4/5
silver dark 20R sr Primus **	sr	exterior	70	OF30045 OF30045-1829	11	63	26	15	64	<0,01	82	0,18	1/2/3/4/5
silver medium 35R sr Primus **	sr	exterior	70	OF30145 OF30145-1829	21	49	30	29	48	<0,01	71	0,29	1/2/3/4/5
silver light 50R sr Primus **	sr	exterior	70	OF30060	40	26	34	53	24	<0,01	51	0,49	1/2/3/4/5
bronze dark 20S sr Primus (C*)	sr	exterior	70	OF30070	9	60	31	17	43	<0,01	83	0,21	1/2/3/4/5
grey dark 20S sr Primus	sr	exterior	70	OF33740	15	42	43	18	15/33	<1	74	0,25	1/2/3/4
grey medium 35S sr Primus	sr	exterior	70	OF33760	27	27	46	36	13/23	<1	61	0,38	1/2/3/4
grey light 50S sr Primus (C*)	sr	exterior	70	OF33790	39	23	37	52	20/20	<0,01	51	0,49	1/2/3/4
one way mirror film dark 7R sr Primus **	sr	exterior	70	33900	7	59	34	8	17/55	<1	84	0,15	1/2/3/4/5
silver dark for PC and PMMA **	sr	exterior	85	OF30065	12	65	23	15	63	<1	83	0,16	PC/PMMA
grey 10NR sr for PC an PMMA	sr	exterior	65	OF30075	12	12	76	10	5	<1	84	0,15	PC/PMMA
HAVERKAMP optimal light 70NR sr Primus (C*)	sr	exterior	70	30185 30185-1829	39	24	37	68	15/16	<0,01	51	0,48	1/2/3/4
HAVERKAMP neotec light 75NR sr Primus (C*)	sr	exterior	165	31115EXT	40	6	53	75	9	<1	46	0,53	1/2/3
HAVERKAMP neotec light 80NR sr Primus (C*)	sr	exterior	165	31120EXT	58	8	34	84	10	<1	33	0,66	1/2/3
<b>UV protection film - interior use</b>													
UV 90 NR sr	sr	interior	50	34400	85	8	7	84	8	0,1	14	0,85	1/2/3/4/5
<b>Decorative and ornamental film - interior use</b>													
stripes white 10mm		interior	50	39700	-	-	-	-	-	-	-	-	1/2/3/4/5
squares white 35mm		interior	50	39710	-	-	-	-	-	-	-	-	1/2/3/4/5
ice age		interior	125	39330	-	-	-	-	-	-	-	-	1/2/3/4/5
<b>Privacy film - interior or exterior use</b>													
white matte classic		interior	50	34600 34600-1829	64	16	20	67	20	1	29	0,70	1/2/3/4/5
silver matte		interior	50	34500	13	49	38	16	60	1	78	0,21	1/2
white opaque		interior	80	34605	10	49	41	7	58	5	70	0,29	1/2
black opaque		interior	50	38010	0,2	11,8	88	0,01	13	<0,01	72	0,27	1
silver white opaque Primus sr ** (also available as Primus Plus variant on request)	sr	exterior	150	34610	8	76	16	5,5	79	1	85	0,14	1/2/3/4/5
silver black opaque Primus sr ** (also available as Primus Plus variant on request)	sr	exterior	150	34620	0,1	81,9	18	0,009	89	<0,01	95	0,04	1/2/3/4/5
<b>Surface protection film exterior use</b>													
anti-vandalism film clear for PC and PMMA	sr	exterior	115	30160	82	8	10	87	9	<1	21	0,78	1/2/3/4/5
anti-vandalism film clear for glass	sr	exterior	190	OF39940	80	12	8	89	11	<4	16	0,83	1/2/3/4/5

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					transmitted (%)	reflected (%)	absorbed (%)	transmitted (%)	reflected internal / external (%)				
<b>Safety / Anti-shatter film - interior or exterior use</b>													
clear safe 115μ sr <sup>2</sup>	sr	interior	115	35100 35100-1829	81	9	10	89	8	<5	16	0,83	1/2/3/4/5
clear safe 190μ sr <sup>2</sup>	sr	interior	190	35200	81	9	10	88	8	<5	16	0,83	1/2/3/4/5
clear safe 230μ sr <sup>2</sup>	sr	interior	230	35400	81	9	10	88	8	<5	16	0,83	1/2/3/4/5
<small>*According to DIN EN 12600</small>													
<b>Safety / Anti-shatter film - interior or exterior use</b>													
safe 115μ sr Primus <sup>2</sup>	sr	exterior	115	OF35150	81	9	10	89	8	<1	16	0,83	1/2/3/4/5
safe 175μ sr Primus <sup>2</sup>	sr	exterior	175	OF35250	81	9	10	88	8	<1	16	0,83	1/2/3/4/5
<small>*According to DIN EN 12600</small>													
<b>safety films</b>													
AS A1 sr <sup>3</sup>	sr	Innen	300	12010	77	9	14	86	9	<2	18	0,81	1/2/3/4/5
AS A1 sr <sup>3</sup>	sr	Innen	300	12015	77	9	14	86	9	<2	18	0,81	1/2/3/4/5
<small>*According to EN 356 P2A</small>													
<b>Specials</b>													
birdsafesafe® bird protection film dot grid black/black	sr	exterior	115	35510	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
birdsafesafe® bird protection film rhombus grid black/black	sr	exterior	115	35500	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
birdsafesafe® bird protection film rhombus grid black/orange	sr	exterior	115	35550	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
birdsafesafe® bird protection film Greenline Design 01	sr	exterior	170	35560	38	24	38	67	15	<0,01	51	0,48	1/2/3/4
birdsafesafe® bird protection Design 01 black	sr	exterior	115	35570	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
Low-E-film 50 LE (C*)	sr	interior	70	33920	35	32/28	37	46	24/23	<1	40	0,59	1/2/3
Anti Fog	sr	interior	50	39950NG	-	-	-	90	-	-	-	-	1/2/3/4/5
For further technical details, see individual data sheet													
								Frequency range (MHz-GHz)	shielding effectiveness (dB)				
Shielding dark 16 RS sr	sr	interior	50	S60000	15	49	36	10-4	27	<1	78	0,21	1/2
Shielding dark 17 SB sr	sr	interior	70	S60010	9	61	30	10-4	32	<1	82	0,17	1/2
Shielding light 70 SG sr	sr	interior	50	S60020	47	30	23	10-4	23	<1	48	0,51	1/2/3/4
Shielding dark 16 RS sr Primus Plus	sr	exterior	70	S60000EXT	14	63	23	10-4	26	<1	84	0,15	1/2/3/4/5
Shielding medium 25 RS sr Primus Plus	sr	exterior	70	S60030EXT	20	50	30	10-4	22	<1	70	0,29	1/2/3/4/5

- \* non-binding recommendation for glass types:
- 1 float glass ; toughened glass (ESG)
  - 2 insulating glass
  - 3 laminated safety glass (VSG); double heat- (Low-E) and sun protection glazing
  - 4 VSG; double-heat + triple heat- (Low-E) and sun protection glazing; triple heat (Low-E) only in combination with ESG as outer pane
  - 5 triple-heat- (Low-E) and sun protection glazing

\*\* important: Please note that a extreme mirror effect might result from installation of high reflective exterior sun protection film on concaved surfaces. Due to highly concentrated light, objects placed next to the surfaces might melt or burn.

C\*: Data determined with Haverkamp E-Calculator according to EN 410 : 2011 - 04

All data listed refer on a 3mm single glazing. The light transmission and light reflexion referred through a spectrometer under C.I.C and D-65 daylight. UV Transmittance was measured in the range of 300 - 380 nm. The rejection of the total solar energy tested according to HAVERKAMP standards. HAVERKAMP Primus series films are of limited suitability for roof windows. We recommend to use silver 20R or PRIMUS PLUS instead. All data is subject to normal manufacturing tolerances. Technical modifications reserved.