

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 (%)				
sun protection film - interior use													
OPALFILM® silver 20R sr ** (C*)	sr	interior	50	30000 30000-1829	11	53	36	15	61	<0,01	79	0,20	1/2
OPALFILM® silver 35R sr ** (C*)	sr	interior	50	30100	21	40	38	29	45	<0,01	69	0,30	1/2
OPALFILM® silver 50R sr ** (C*)	sr	interior	50	30250	40	22	38	53	22	<0,01	49	0,50	1/2
OPALFILM® brillant 70NR sr	sr	interior	50	31105	49	27	24	70	15	<1	49	0,50	1/2
OPALFILM® imperial 65S sr	sr	interior	50	31100	42	28	30	60	19	<1	50	0,49	1/2
OPALFILM® one way mirror film 7R sr **	sr	interior	50	30360	12	54	34	8	12/52	<1	80	0,19	1/2
OPALFILM® neotec 80NR sr (C*)	sr	interior	50	31120	58	7	35	84	10	0,01	33	0,66	1/2/3
Sonnenschutzfolien außen													
OPALFILM® silver 20R **		exterior	50	30020	13	65	22	18	63	<1	81	0,18	1/2/3/4/5
OPALFILM® silver 20R Primus Plus (C*)	sr	exterior	70	30150	11	63	26	15	64	<0,01	82	0,17	1/2/3/4/5
OPALFILM® silver 35R Primus Plus (C*)	sr	exterior	70	30155	21	49	30	29	48	<0,01	71	0,28	1/2/3/4/5
OPALFILM® silver 50R Primus Plus (C*)	sr	exterior	70	30180	40	26	34	53	24	<0,01	51	0,48	1/2/3/4/5
OPALFILM® silver 20R sr Primus **	sr	exterior	70	OF30045 OF30045-1829	11	63	26	15	64	<0,01	82	0,17	1/2/3/4/5
OPALFILM® silver 35R sr Primus **	sr	exterior	70	OF30145 OF30145-1829	21	49	30	29	48	<0,01	71	0,28	1/2/3/4/5
OPALFILM® silver 50R sr Primus **	sr	exterior	70	OF30060	40	26	34	53	24	<0,01	51	0,48	1/2/3/4/5
OPALFILM® bronze 20S sr Primus (C*)	sr	exterior	70	OF30070	9	60	31	17	43	<0,01	83	0,16	1/2/3/4/5
OPALFILM® grey 20S sr Primus	sr	exterior	70	OF33740	15	42	43	18	15/33	<1	74	0,25	1/2/3/4
OPALFILM® grey 35S sr Primus	sr	exterior	70	OF33760	27	27	46	36	13/23	<1	61	0,38	1/2/3/4
OPALFILM® grey 50S sr Primus (C*)	sr	exterior	70	OF33790	39	23	37	52	20/20	<0,01	51	0,48	1/2/3/4
OPALFILM® one way mirror film 7R sr	sr	exterior	70	33900	7	59	34	8	17/55	<1	84	0,15	1/2/3/4/5
OPALFILM® silver for PC and PMMA **	sr	exterior	85	OF30065	12	65	23	15	63	<1	83	0,16	PC/PMMA
UV protection film - interior use													
OPALFILM® UV 90 NR sr	sr	interior	50	34400	85	8	7	84	8	0,1	14	0,85	1/2/3/4/5
Decorative and ornamental film - interior use													
OPALFILM® stripes white 10mm		interior	50	39700	-	-	-	-	-	-	-	-	1/2/3/4/5
OPALFILM® squares white 35mm		interior	50	39710	-	-	-	-	-	-	-	-	1/2/3/4/5
OPALFILM® ice age		interior	125	39330	-	-	-	-	-	-	-	-	1/2/3/4/5
Privacy film - interior or exterior use													
OPALFILM® white matte classic		interior	50	34600 34600-1829	64	16	20	67	20	1	29	0,70	1/2/3/4/5
OPALFILM® silver matte		interior	50	34500	13	49	38	16	60	1	78	0,21	1/2
OPALFILM® white opaque		interior	80	34605	10	49	41	7	58	5	70	0,29	1/2
OPALFILM® black opaque		interior	50	38010	0,2	11,8	88	0,01	13	<0,01	72	0,27	1
OPALFILM® silver white opaque Primus sr	sr	exterior	150	34610	8	76	16	5,5	79	1	85	0,14	1/2/3/4/5
OPALFILM® silver black opaque Primus sr	sr	exterior	150	34620	0,1	81,9	18	0,009	89	<0,01	95	0,04	1/2/3/4/5
Surface protection film exterior use													
OPALFILM® 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
OPALFILM® anti-vandalism film clear for glass	sr	exterior	190	OF39940	80	12	8	89	11	<4	16	0,83	1/2/3/4/5
Safety / Anti-shatter film - interior or exterior use													
OPALFILM® clear safe 115µ sr ²	sr	interior	115	35100 35100-1829	81	9	10	89	8	<5	16	0,83	1/2/3/4/5
OPALFILM® clear safe 190µ sr ²	sr	interior	190	35200	81	9	10	88	8	<5	16	0,83	1/2/3/4/5
OPALFILM® clear safe 230µ sr ²	sr	interior	230	35400	81	9	10	88	8	<5	16	0,83	1/2/3/4/5

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Safety / Anti-shatter film - interior or exterior use													
OPALFILM® safe 115µ sr Primus ²	sr	exterior	115	OF35150	81	9	10	89	8	<1	16	0,83	1/2/3/4/5
OPALFILM® safe 175µ sr Primus ²	sr	exterior	175	OF35250	81	9	10	88	8	<1	16	0,83	1/2/3/4/5
OPALFILM® white matte safe 125µ sr ²	sr	interior	150	A030773	67	18	15	69	12	<3	28	0,71	1/2/3/4/5
safety films													
OPALFILM® AS A1 sr ³	sr	Innen	300	12010	77	9	14	86	9	<2	18	0,81	1/2/3/4/5
OPALFILM® AS A1 sr ³	sr	Innen	300	12015	77	9	14	86	9	<2	18	0,81	1/2/3/4/5
Specials													
OPALFILM® birdsafe® bird protection film with rhombus grid black/black	sr	exterior	115	35500	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
OPALFILM® birdsafe® bird protection film with rhombus grid black/orange	sr	exterior	115	35550	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
OPALFILM® birdsafe® bird protection film Greenline	sr	exterior	165	35560	40	6	53	75	9	0,01	46	0,53	1/2/3/4/5
OPALFILM® birdsafe® bird protection Design 01 black	sr	exterior	115	35570	76	9	15	80	8	<1	20	0,79	1/2/3/4/5
								Frequency range (MHz-GHz)	shielding effectiveness (dB)				
OPALFILM® Shielding 16 RS sr	sr	interior	50	S60000	15	49	36	10-4	27	<1	78	0,21	1/2
OPALFILM® Shielding 17 SB sr	sr	interior	70	S60010	9	61	30	10-4	32	<1	82	0,17	1/2
OPALFILM® Shielding 70 SG sr	sr	interior	50	S60020	47	30	23	10-4	23	<1	48	0,51	1/2/3/4
OPALFILM® Shielding 16 RS sr Primus Plus	sr	exterior	70	S60000EXT	14	63	23	10-4	26	<1	84	0,15	1/2/3/4/5
OPALFILM® Shielding 25 RS sr Primus Plus	sr	exterior	70	S60030EXT	20	50	30	10-4	22	<1	70	0,29	1/2/3/4/5

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Self-tinting sun protection film for interior or exterior use													
					bright / dark			bright / dark		bright / dark	bright / dark		
HAVERKAMP Dynamic 75-30 (C*)	sr	interior	100	D10000	41/21	28/27	31/53	69/18	10/6	<0,01	50/66	0,49/0,33	1/2/3
HAVERKAMP Dynamic 75-30 sr Primus (C*)	sr	exterior	215	D10000EXT	41/21	31/29	28/50	69/18	9/6	<0,01	51/67	0,48/0,32	1/2/3
HAVERKAMP Dynamic 50-34 (C*)	sr	interior	100	D10015	34/25	8/7	58/68	54/32	10/7	<0,01	51/58	0,48/0,41	1
HAVERKAMP Dynamic 50-34 sr Primus (C*)	sr	exterior	215	D10015EXT	34/25	7/7	59/68	54/32	8/7	<0,01	52/59	0,48/0,41	1/2/3
Sonnenschutzfolien außen													
HAVERKAMP optimal 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 75NR sr Primus (C*)	sr	exterior	165	31115EXT	40	6	53	75	9	0,01	46	0,53	1/2/3
HAVERKAMP neotec 80NR sr Primus (C*)	sr	exterior	165	31120EXT	58	8	34	84	10	0,01	33	0,66	1/2/3



PRODUCT LIST



technical data sheet updated 01-2021

²according to DIN EN 12600

³according to EN 356 P2A

* 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.