



FILM INSTALLATION GUIDELINES

ARCHITECTURAL EXTERIOR WINDOW FILMS

Note: Reference Installation Guidelines - Definition for detailed explanation of the following calculation table

Primary Stress

	Clear Single Pane			Clear Dual Pane			Clear Triple Pane			Tinted Single Pane			Tinted Dual Pane			Low-E Dual Pane		
	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"
Ultra-Vision ULV EXT 50	6	6	7	6	6	7	8	8	9	6	6	7	6	6	7	8	8	9
Infinity IXT 35 IXT 20	6 4	6 4	7 5	6 5	6 5	7 6	8 6	8 6	9 7	6 4	6 4	7 5	6 5	6 5	7 6	8 6	8 6	9 7
Silver SXT 50 SXT 35 SXT 20	3 3 3	3 3 3	4 4 4	4 4 4	4 4 4	5 5 5	5 5 5	5 5 5	6 6 6	3 3 3	3 3 3	4 4 4	4 4 4	4 4 4	5 5 5	5 5 5	5 5 5	6 6 6

SunTek's Exterior Series of window film products are designed for installation on the exterior surface of annealed, heat strengthened, or tempered glass. Please refer to "SunTek Window Films/Residential and Commercial Exterior Films Limited Warranty/Glass Breakage and Seal Failure Limited Warranty" for details of the warranty coverage.

Additional Stress

Summer Temperature 109° to 115° (43° C) over 115°	1 2	Scratched or Chipped Glass badly scratched chipped edges	2 NR	Pane Size 50 to 100 sq ft Over 100 sq ft	1 NR	Frame Condition steel or concrete frame deteriorated rubber gasket no rubber gasket	1 1 2	Shading straight shadow "L" shaped shadow "T" or "V" shaped shadow	1 2 3
Altitude 2,000 to 7,000 ft 7,000 to 10,000 ft Over 10,000 ft	1 2 3	Window Treatment Distance less than 5 inches (50mm - 150mm)		1					

Add: "Primary Stress" _____ **+** **"Additional Stress"** _____ **= Total Stress Factors for Installation** _____

10 or less = any glass

14 or less = heat strengthened glass

18 or less = tempered glass

19 or higher = not recommended (NR)



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Primary Stress

	HP Low-E Dual Pane			Clear Single Pane Laminated			Clear Dual Pane Laminated			Tinted Single Pane Laminated			Tinted Dual Pane Laminated		
	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"
Ultra-Vision ULV EXT 50	8	8	9	6	6	7	6	6	7	6	6	7	6	6	7
Infinity IXT 35 IXT 20	8 6	8 6	9 7	6 4	6 4	7 5	6 5	6 5	7 6	6 4	6 4	7 5	6 5	6 5	7 6
Silver SXT 50 SXT 35 SXT 20	5 5 5	5 5 5	6 6 6	3 3 3	3 3 3	4 4 4	4 4 4	4 4 4	5 5 5	3 3 3	3 3 3	4 4 4	4 4 4	4 4 4	5 5 5

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Definitions:

Thermal Stress Fracture – Solar control films help reduce heat gains by absorbing and reflecting solar energy, thus allowing less heat to enter through the glazing unit. Improper selection and use of solar control films can cause extreme thermal expansion and stress to the glazing unit resulting in possible glass breakage and/or seal failure to insulated glass. It is important to know how each film and glazing unit combinations will react when installed.

Calculating the Stress Factors – There are two stress factors that must be calculated to help prevent glass breakage and/or seal failure to insulated glass, the **Primary Stress** and **Additional Stress**. First, using the Primary Stress Factors, choose the film, the thickness and type of glazing unit that will have film installed. The numbers displayed represent the combination of the film and glazing unit temperature with the higher the number, the greater the absorption. Next, add up all of the **Additional Stress**. These numbers will include variables such as Summer Temperature, Shading, Frame Conditions, Altitude, Pane Size and Window Treatments. For instance, if the condition of the glazing unit in question has a “L” shaped shadow, add 2; if pane size is over 50 square feet, add 1, giving a total of 3 for Additional Stress Factors. Finally, add the **Primary Stress** to the **Additional Stress** to get the **Total Stress** for the chosen film applied to the glazing unit. Tempered glazing units always have a symbol, so if there is no symbols in one of the corners, then presume glazing unit is annealed. For the examples stated, add 5 (SYDS 50 on 3/8” clear single pane) plus 3 (“L” shaped shadow, pane size over 50 sq ft) equals a total of 8 for **Total Stress Factor**. This example shows that the SYDS 50 can be applied to annealed, heat strengthened or tempered glazing units.

*There is no warranty on glazing units that are 1/2” thick or thicker and wired glass.

Descriptions of Additional Stress

Summer Temperature is normal summer air temperature.

Window Treatments such as blinds and dark drapes cause more heat to be trapped around the window causing additional stress.

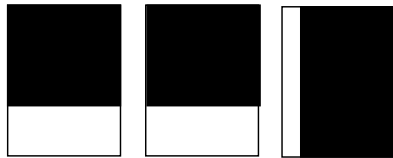
Frame Conditions will affect how much expansion there is to glass. Rigid frames, deteriorated gaskets, direct metal to glass contact, no gaskets or sealant increase additional stress to glazing unit’s pane as it swells.

Scratched or Chipped Glass is hard to find unless there are visible cracks and chips. Most flaws are hidden inside the pane where the glazing unit has chipped edges.

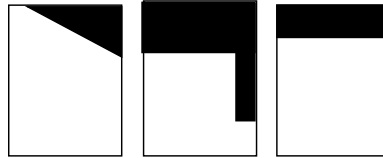
Altitude high above sea level can cause additional stress because morning sunlight will heat up glazing units faster than normal.

Pane Size becomes larger, additional stress increases.

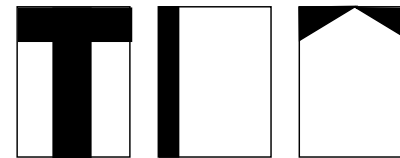
Shading causes disproportionate heating. This influences certain geographical areas more than others. There are three different types of shading that can be combined together (vertical, horizontal, or diagonal).



“Straight shadow” category



“L shaped shadow” category



“T or V shaped shadow” category



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Primary Stress

	Clear Single Pane			Clear Dual Pane			Clear Triple Pane			Tinted Single Pane			Tinted Dual Pane			Low-E Dual Pane		
	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"	1/8"	1/4"	3/8"
Ultra-Vision DS																		
ULVDS 70	5	5	6	5	5	6	10	10	13	6	6	7	5	5	6	7	7	8
ULVDS 50	5	5	6	5	5	6	12	12	NR	6	6	7	5	5	6	7	7	8
ULVDS 40	6	6	7	10	10	11	NR	NR	NR	8	8	9	8	8	9	10	10	11
Symphony DS																		
SYDS 50	5	5	6	7	7	8	10	10	12	6	6	7	7	7	8	7	7	9
SYDS 35	5	5	6	7	7	8	10	10	12	7	7	8	7	7	8	7	7	8
SYDS 25	5	5	6	7	7	8	10	10	12	7	7	8	7	7	8	9	9	10
SYDS 15	5	5	6	7	7	8	10	10	12	8	8	9	8	8	9	9	9	10
Dual-Reflective DS																		
DRDS 35	6	6	7	8	8	9	9	9	12	6	6	7	5	5	6	8	8	9
DRDS 25	6	6	7	10	10	11	12	12	14	8	8	9	5	5	6	10	10	11
DRDS 15	6	6	7	9	9	10	11	11	13	7	7	8	8	8	9	9	9	10
Infinity DS																		
IDS 50 Neutral	5	5	6	7	7	8	9	9	10	7	7	8	6	6	7	7	7	8
IDS 35 Neutral	6	6	7	9	9	10	11	11	12	7	7	8	8	8	9	9	9	10
IDS 20 Neutral	7	7	8	11	11	12	12	12	14	8	8	9	11	11	12	11	11	12
IDS 35 Bronze	5	5	6	6	6	7	8	8	10	6	6	7	7	7	8	7	7	8
IDS 20 Bronze	5	5	6	7	7	8	9	9	11	7	7	8	7	7	8	9	9	10
Silver DS																		
SDS 35	4	4	5	5	5	6	6	6	8	7	7	8	7	7	8	7	7	8
SDS 20	5	5	6	6	6	7	7	7	9	8	8	9	9	9	10	9	9	10
Safety/Security																		
5M & 9M Symmetry 25	6	6	7	10	10	11	NR	NR	NR	8	8	9	5	5	6	10	10	11
5M & 9M Symmetry 15	6	6	7	9	9	10	10	10	11	7	7	8	8	8	9	9	9	10
5M & 9M Silver 20	5	5	6	6	6	7	8	8	9	8	8	9	9	9	10	7	7	8
4M & 6M Anti-Graffiti	1	1	2	2	2	3	4	4	5	3	3	4	4	4	5	2	2	3
2M to 13M Clear	1	1	2	2	2	3	4	4	5	3	3	4	4	4	5	2	2	3
Specialty Films																		
Black Out	16	16	16	NR	NR	NR	NR	NR	NR	16	16	16	NR	NR	NR	NR	NR	NR
White Out	6	6	7	9	9	10	11	11	13	7	7	8	8	8	9	9	9	10
White Matte	5	5	5	7	7	7	8	8	8	7	7	7	7	7	7	8	8	8
Crystal PET	1	1	2	2	2	3	4	4	5	3	3	4	4	4	5	2	2	3
Crystal Vinyl	1	1	2	2	2	3	4	4	5	3	3	4	4	4	5	2	2	3
LRDS 10	9	9	10	NR	NR	NR	NR	NR	NR	10	10	11	NR	NR	NR	NR	NR	NR
DR Mirror 7 SR/PS	5	5	6	7	7	8	8	8	10	7	7	8	7	7	8	9	9	10

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Additional Stress

Summer Temperature

109° to 115° (43° C)	1
over 115°	2

Scratched or Chipped Glass

badly scratched	2
chipped edges	NR

Pane Size

50 to 100 sq ft	1
Over 100 sq ft	NR

Frame Condition

steel or concrete frame	1
deteriorated rubber gasket	1
no rubber gasket	2

Shading

straight shadow	1
"L" shaped shadow	2
"T" or "V" shaped shadow	3

Altitude

2,000 to 7,000 ft	1
7,000 to 10,000 ft	2
Over 10,000 ft	3

Window Treatment Distance

less than 4 inches (10cm or 100mm)	1
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Add: "Primary Stress" _____ **+** **"Additional Stress"** _____ **= Total Stress Factors for Installation** _____

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109° to 115° (43° C)	1	badly scratched	2	50 to 100 sq ft	1	steel or concrete frame	1	straight shadow	1
over 115°	2	chipped edges	NR	Over 100 sq ft	NR	deteriorated rubber gasket	1	"L" shaped shadow	2
						no rubber gasket	2	"T" or "V" shaped shadow	3
Altitude		Window Treatment Distance							
2,000 to 7,000 ft	1	less than 4 inches (10cm or 100mm)	1						
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Over 10,000 ft	3								

Add: "Primary Stress" _____ **+** **"Additional Stress"** _____ **=** **Total Stress Factors for Installation** _____

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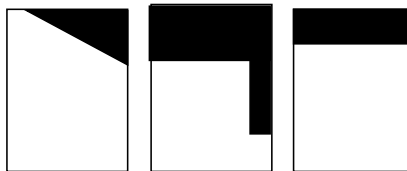
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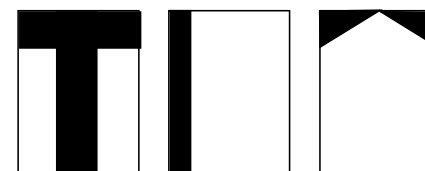
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