

## FILM TO GLASS RECOMMENDATIONS



## GUIDELINES FOR PREVENTING GLASS FAILURES

WHEREVER THERE IS GLASS, WE CAN *improve* IT.

Founded in 1903, Madico has established itself as one of the world's foremost providers of glass films for the widest array of applications: safety and security, energy control, anti-intrusion/anti-vandalism, and view control. The company's commitment to glass film innovation has earned recognition from such esteemed organizations as the Protecting People First Foundation, while Madico's dedication to responsible testing has helped it earn certifications from Factory Mutual, Underwriters Laboratories and other reputable agencies.

### IWFA Information

#### Will Window Films Cause Glass to Break?

Glass breaks when stressed. There are five types of stress which may cause glass breakage:

1. Thermal Stress – from absorption of solar radiation.
2. Tensile Stress – from the weight of the glass itself.
3. Mechanical Flexing Stress – from wind.
4. Impact Stress – from flying objects, hail, baseballs.
5. Twisting Stress – from building or window frame sagging or settling.

The first type, thermal stress, is only one of which film may affect. The use of window films will increase the thermal stress on sunlit glass. However, there are also other factors which will increase thermal stress such as: partial shading of windows from overhangs, tightly fitting drapes or blinds, signs or decals on windows, heating and cooling vents directed at glass. In addition, different types of glass (annealed versus tempered, clear versus tinted) have different solar absorption rates and will withstand different degrees of thermal stress.

The window film manufacturers have recommended film-to-glass tables for use by factory-trained dealer installers. If a consumer is ever in doubt, he/she should request a copy of such guidelines. Listed are some glass types or conditions where the use of a solar control (not clear safety) type of window film is not recommended without extreme caution.

- Single pane glass larger than 100 square feet
- Double pane glass larger than 40 square feet
- Clear glass thicker than 3/8 inch
- Tinted glass thicker than 1/4 inch
- Window framing systems of concrete, solid aluminum, or solid steel
- Glass where sealant or glazing compound has hardened
- Visibly chipped, cracked or otherwise damaged glass
- Reflective, wired, textured, or patterned glass
- Triple pane glass
- Laminated glass windows

# Madico Film Usage Recommendations

Product	Description	Visible Light Transmitted	Solar Energy Reflectance	Solar Energy Absorbance	Configuration	Configuration														Laminated – Clear or Tinted Any Size	Product
						Clear Annealed		Single Pane	Tinted Annealed		Dual Pane		Outboard Tinted		Inboard Tinted		Inboard/Outboard				
						1/8"-1/4" Mono 1-40 sq ft	1/8"-1/4" Mono 40-100sq ft	H/S Tempered 1/8"-3/8" Mono 1-100 sq ft	1/8"-1/4" Mono 1-40 sq ft	1/8"-1/4" Mono 40-100sq ft	1/8"-1/4" IG 1-30 sq ft	1/8"-1/4" IG 30-40 sq ft	1/8"-1/4" IG 1-30 sq ft	1/8"-1/4" IG 30-40 sq ft	1/8"-1/4" IG 1-30 sq ft	1/8"-1/4" IG 30-40 sq ft	1/8"-1/4" IG 1-30 sq ft	1/8"-1/4" IG 30-40 sq ft			
<b>Reflective Silver</b>																				<b>Reflective Silver</b>	
SRS 220	Silver	15%	48%	41%		✓	✓	✓	●	✗	●	●	✗	✗	✗	✗	✓	✓	✗	SRS 220	
SRS 220 (BF)*	Silver	15%	48%	41%		✓	✓	✓	●	✗	●	●	✗	✗	✗	✗	✓	✓	✗	SRS 220 (BF)*	
SRS 330	Silver	25%	46%	36%		✓	✓	✓	●	●	✓	●	●	●	●	●	✓	✓	✗	SRS 330	
RS 440	Silver	36%	40%	36%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	RS 440	
<b>Bronze</b>																				<b>Bronze</b>	
SB 221	Bronze	20%	42%	43%		✓	✓	✓	✓	✓	●	●	●	●	●	●	✓	✓	✗	SB 221	
SB 341	Bronze	40%	35%	40%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	SB 341	
<b>Gray</b>																				<b>Gray</b>	
SG 220	Gray	24%	26%	53%		✓	✓	✓	✓	✓	●	●	●	●	●	✗	✓	✓	✗	SG 220	
SG 330	Gray	32%	21%	50%		✓	✓	✓	✓	✓	✓	●	●	●	●	●	✓	✓	✗	SG 330	
SG 550	Gray	50%	11%	43%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	SG 550	
<b>Neutral</b>																				<b>Neutral</b>	
TSG 335	Neutral	40%	22%	40%		✓	✓	✓	✓	✓	●	●	●	●	●	●	✓	✓	✗	TSG 335	
TSG 550	Neutral	45%	17%	40%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	TSG 550	
<b>Neutral Gray</b>																				<b>Neutral Gray</b>	
NG-20	Neutral Gray	13%	33%	51%		✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓	✗	NG-20	
NG-35	Neutral Gray	36%	26%	46%		✓	✓	✓	✓	✓	●	●	●	●	●	●	✓	✓	✗	NG-35	
NG-70	Neutral Gray	64%	12%	29%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	NG-70	
<b>Exterior- Standard</b>																				<b>Exterior- Standard</b>	
SDSS 220 X	Exterior Silver	15%	60%	28%		✓	✓	✓	✓	✓	✓	✓	✓	✓	●	●	✓	✓	✓	SDSS 220 X	
<b>Exterior- Duralux®</b>																				<b>Exterior- Duralux®</b>	
SDSS 220 XK	Exterior Silver	15%	60%	28%		✓	✓	✓	✓	✓	✓	✓	✓	●	●	✓	✓	✓	✓	SDSS 220 XK	
<b>Designer Gray</b>																				<b>Designer Gray</b>	
DG-35	Designer Gray	38%	23%	44%		✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	✓	✓	✗	DG-35	
DG-45	Designer Gray	42%	15%	45%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	DG-45	
DG-55	Designer Gray	51%	14%	39%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	DG-55	
<b>Starlite</b>																				<b>Starlite</b>	
SL-180	Starlite	8%	53%	41%		✓	✓	✓	✓	✓	●	●	✗	✗	✗	✗	✓	✓	✗	SL-180	
SL-280	Starlite	28%	35%	42%		✓	✓	✓	✓	✓	✓	✓	✓	✓	●	●	✓	✓	✗	SL-280	
SL-380	Starlite	37%	22%	46%		✓	✓	✓	✓	✓	✓	✓	✓	✓	●	●	✓	✓	✗	SL-380	
<b>Soft Bronze</b>																				<b>Soft Bronze</b>	
SB-25	Soft Bronze	25%	45%	43%		✓	✓	✓	✓	✓	●	●	●	●	●	●	✓	✓	✗	SB-25	
SB-35	Soft Bronze	35%	29%	41%		✓	✓	✓	✓	✓	●	●	✓	✓	●	●	✓	✓	✗	SB-35	
<b>Advanced Ceramic</b>																				<b>Advanced Ceramic</b>	
MAC 3000	Ceramic	33%	20%	56%		✓	✓	✓	✗	✗	●	●	●	✗	●	✗	✓	✓	✗	MAC 3000	
MAC 4000	Ceramic	43%	17%	49%		✓	✓	✓	●	✗	✓	●	✓	✓	●	✓	✓	✓	✗	MAC 4000	
MAC 6000	Ceramic	61%	11%	36%		✓	✓	✓	✓	●	✓	✓	✓	✓	✓	✓	✓	✓	✗	MAC 6000	
<b>Safety Safety</b>																				<b>Safety Safety</b>	
DG-35 4Mil	Designer Gray	38%	23%	44%		✓	✓	✓	✓	✓	✓	●	✓	✓	✓	✓	✓	✓	✗	DG-35 4Mil	
DG-45 4Mil	Designer Gray	42%	15%	45%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	DG-45 4Mil	
DG-35 8Mil	Designer Gray	38%	23%	44%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	DG-35 8Mil	
DG-45 8Mil	Designer Gray	42%	15%	45%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	DG-45 8Mil	
<b>SafetyShield</b>																				<b>SafetyShield</b>	
SafetyShield 800	2 ply 8 mil Safety	84%	10%	12%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SafetyShield 800	
SafetyShield 1500	3 ply 15 mil Safety 8	0%	10%	17%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	SafetyShield 1500	
<b>Graffiti Free</b>																				<b>Graffiti Free</b>	
LCL-600-XSRG	6 mil Graffiti	83%	10%	11%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LCL-600-XSRG	
LCL-600-BFXSR*	6mil for Polycarbonate	83%	10%	11%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LCL-600-BFXSR*	
<b>Clear Safety Films</b>																				<b>Clear Safety Films</b>	
CLS-200-XSR (UV+)	2 mil UV blocking	78%	8%	18%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CLS-200-XSR (UV+)	
CL-200-XSR	2 mil clear	78%	10%	12%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CL-200-XSR	
CL-200-BFX*	2mil for Polycarbonate	78%	10%	12%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CL-200-BFX*	
CL-400-XSR	4 mil Safety	84%	10%	11%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CL-400-XSR	
CL-700-XSR	7 mil Safety	84%	10%	14%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CL-700-XSR	
CL-700-BFXSR*	7 mil for Polycarbonate	84%	10%	14%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CL-700-BFXSR*	
LCL-800-XSR	2 ply 8 mil Safety	84%	10%	12%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LCL-800-XSR	
LCL-1400-XSR	2 ply 14 mil Safety	82%	10%	16%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LCL-1400-XSR	
<b>4 Mil Solar</b>																				<b>4 Mil Solar</b>	
4Mil SRS-220	Silver Safety	15%	48%	41%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	4Mil SRS-220	
4 Mil RS-440	Silver Safety	36%	36%	40%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	4 Mil RS-440	
4 Mil NG-50	Grey Safety	43%	14%	46%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	4 Mil NG-50	
<b>8 Mil Solar</b>																				<b>8 Mil Solar</b>	
8 Mil SRS-220	Silver Safety	15%	48%	41%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	8 Mil SRS-220	
8 Mil RS-440	Silver Safety	36%	36%	40%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	8 Mil RS-440	
<b>Matte Opaque</b>																				<b>Matte Opaque</b>	
RMS 220	Silver Matte	15%	46%	42%		●	●	✓	●	●	●	●	●	●	●	●	✓	✓	✗	RMS 220	
MT 200-W	White Matte	66%	12%	25%		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	MT 200-W	
MT 200-B	Bronze Matte	25%	11%	48%		✓	●	✓	✓	●	●	●	●	●	●	●	✓	✓	✗	MT 200-B	
MT 200-G	Gray Matte	21%	9%	55%		✓	●	✓	✓	●	●	●	●	●	●	●	✓	✓	✗	MT 200-G	
<b>Blackout</b>																				<b>Blackout</b>	
Blackout-X	Blackout	0%	7%	92%		✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✗	Blackout-X	
<b>DecoLite®</b>																				<b>DecoLite®</b>	
HG-807	Angles	98%				●	●	✓	●	●	●	●	●	●	●	●	✓	✓	✗	HG-807	
HG-810	Rice Paper	98%				●	●	✓	●	●	●	●	●	●	●	●	✓	✓	✗	HG-810	
HG-81																					