



SECTION 08 87 16 – ULTRA SAFETY FILM SECTION 08 87 53 – ULTRA SECURITY FILM

PART 1 - GENERAL

1.1 SUMMARY

A.

Section Includes:

1. Shatter resistant and abrasion resistant window films designed to be applied to interior window surfaces to hold broken glass together and reduce ultra-violet light, and heat and glare reduction.

1.2 SYSTEM DESCRIPTION

A. Performance Requirements:

1.

Window Film.

3M Ultra Prestige Safety and Security

The following performance information is

based on 1/4 inch (6 mm) clear glass unless indicated otherwise:

Scope (Clear Films)	SCLARL 150	SCLARL 400	Ultra 600
Thickness (mils)	2.0	4.0	6.0
(inches)	0.0020	0.0040	0.0060
Emissivity	0.87	0.87	0.87
U Value	1.09	1.09	1.09
Visible Light Transmission	87%	86%	85%
Visible Reflection	11%	11%	10%
Ultraviolet Transmission	<2%	<2%	<2%
Shading Coefficient	0.92	0.91	0.90
Tear Resistance	>350 lbs.%	>780 lbs.%	>1150 lbs.%
Safety Glazing	150 ftlb	400 ftlb.	400 ftlb.
	Category I	Category II	Category II
Air Blast Testing – Minimum Level 3 @ 4.0 PSI	NA	Yes	Yes
Tensile Strength	30,000 PSI	30,000 PSI	30,000 PSI
Young's Modulus (PSI)	<500k PSI	500k PSI	500k PSI
PPT (Puncture Propagation Tear)	2.0 lbs.	7.5 lbs.	19.2 lbs.
Elongation	140%	140%	140%
Break Strength (Per inch width)	60 lbs.	120 lbs.	180 lbs.



Scope (Sun Control)	S20SIAR400	S35N FAR40	S50N FAR4000
Thickness (mils)	4.0	4.0	4.0
(inches)	0.0040	0.0040	0.0040
Emissivity	0.79	0.87	0.87
U Value	1.02	1.09	1.09
Visible Light Transmission	19%	37%	51%
Visible Reflection	58%	20%	15%
Ultraviolet Transmission	<1%	<1%	<2%
Shading Coefficient	0.26	0.51	0.66
Tear Resistance	>780 lbs.%	>780 lbs.%	>1150 lbs.%
Safety Glazing	400 ftlb	400 ftlb.	400 ftlb.
	Category II	Category II	Category II
Air Blast Testing – Minimum Level 3 @ 4.0 PSI	Yes	Yes	Yes
Tensile Strength	30,000 PSI	30,000 PSI	30,000 PSI
Young's Modulus (PSI)	<500k PSI	500k PSI	500k PSI
PPT (Puncture Propagation Tear)	7.5 lbs.	7.5 lbs.	7.5 lbs.
Elongation	140%	140%	140%
Break Strength (Per inch width)	120 lbs.	120 lbs.	120 lbs.

- B. Film Attributes: The following attribute information is based upon 1/4 inch (6 mm) clear glass unless indicated otherwise:
1. Adhesive System: High mass, optically clear, pressure sensitive, weatherable, acrylate adhesive applied uniformly over surface opposite abrasion resistant coated surface.
 2. Flammability: Class A Interior Finish for Buildings Materials for both Flame Spread Index and Smoke Development Values per ASTM E84.
 3. Abrasion Resistance: Surface coating resistant to abrasion, with less than 5 percent increase of transmitted light haze resulting per ASTM D1044 using 100 cycles, 500 grams of weight, and CS10F Calbrase Wheel.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Manufacturer will ensure proper quality control during production, shipping, and inventory, clearly identify and label each film core with product designation and run number.
- B. Deliver materials to project site with manufacturer's labels intact and legible.

1.4 QUALITY ASSURANCE

- A. Dealer and Applicator Qualifications: Provide documentation that dealer and applicator are authorized by manufacturer of window film to install window films.



1. Provide reference list of 10 projects of similar size on which applicator has installed window films. Include on the following:
 - a. Name of buildings.
 - b. Name and telephone numbers of management contacts.
 - c. Types of glass.
 - d. Types of film.
 - e. Amount of film installed.
 - f. Dates of completion.
2. Upon request, provide Glass Stress Analysis of existing glass and proposed glass/film combination as recommended by film manufacturer.
3. Upon request, provide application analysis to determine available energy cost reduction and savings.

1.5 WARRANTY

- A. Warrant materials and workmanship for 15 years against defects after completion and final acceptance of Work.
 1. Repair defects from faulty materials or workmanship developed during guarantee period, or replace with new materials, at no cost to Owner.
 2. Warranty covers the following:
 - a. Film will maintain solar reflective properties without cracking, crazing, delaminating, peeling, or discoloration.
 - b. Glass failure due to thermal shock fracture of glass (maximum value of \$500.00 per window) provided film is applied to recommend types of glass and failure occurs within 60 months from start of application. Glass failures shall be reviewed by film manufacturer prior to replacement.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide projects from the following manufacturer:
 1. 3M Building & Commercial Services Division (B&CSD).
 2. 3M Center Building 223-2S-24.
 3. St. Paul, MN 55144-1000.
 4. 3M Point of Contact: John Susnik - Sunray®, 1-800-295-8468, john@sunrayfilms.com.

2.2 MATERIALS

- A. Film Material – Clear: Film material consists of 3 layers of optically clear, micro-layered, polyester film (SCLARL 150), laminated to another clear, micro-layered, polyester film (SCLARL 400), and again laminated to a third micro-layered, polyester film (ULTRA 600), with durable, acrylic, abrasion-resistant coating over surface.
 1. Film Color: Clear, containing no dyed polyesters.
 2. Provide uniform film, without noticeable pin holes, streaks, thin spots, scratches, banding, or other optical defects. Variation in total transmission across width, at any portion along length, shall not exceed 2 percent over average. Provide film with no evidence of coating voids.
 3. Film Thickness: Nominal thickness of 12.0 mils (0.0012 inches).



SPECIFIER NOTE: RETAIN APPROPRIATE FILM TYPE IN SUBPARAGRAPH BELOW. DELETE FILM TYPES NOT REQUIRED FOR PROJECT.

- B. Acceptable Products: 3M™ Scotchshield Ultra High Performance Safety and Security Window Film.
 - 1. Ultra High Performance SCLARL 150.
 - 2. Ultra High Performance SCLARL 400.
 - 3. Ultra High Performance ULTRA 600.

- C. Film Material – Sun Control: Film material consists of an optically clear, multi-layered, polyester film laminated to a metallized, multi-layered, polyester film, with durable, acrylic, abrasion-resistant coating over surface.
 - 1. Film Color: Derived from metal coatings. Product contains no dyed polyesters.
 - 2. Provide uniform film, without noticeable pin holes, streaks, thin spots, scratches, banding, or other optical defects. Variation in total transmission across width, at any portion along length, shall not exceed 2 percent over average. Provide film with no evidence of coating voids.
 - 3. Film Thickness: Nominal thickness of 4.0 mils (0.004 inches).

SPECIFIER NOTE: RETAIN APPROPRIATE FILM TYPE IN SUBPARAGRAPH BELOW. DELETE FILM TYPES NOT REQUIRED FOR PROJECT.

- D. Acceptable Products: 3M™ Scotchshield Ultra High Performance Safety and Security Window Film.
 - 1. Ultra High Performance S20S IAR400.
 - 2. Ultra High Performance S35NEAR400.
 - 3. Ultra High Performance S50NEAR400.

PART 3 - EXECUTION

3.1 EXAMINATION

SPECIFIER NOTE: RETAIN APPROPRIATE PROJECT OPTION IN PARAGRAPH BELOW. DELETE OPTION NOT REQUIRED FOR PROJECT.

- A. Examine glass surfaces to receive film and verify that they are free from defects and imperfection, which will affect final appearance. Correct and note such deficiencies to **[Owner] [Architect]** prior to commencing film application.

3.2 PREPARATION

- A. Use protective tarps and drop cloths to cover interior finishes near window.
- B. Clean window and window framing thoroughly with neutral cleaning solution. Blade inside surface of window glass with industrial razors to insure removal of foreign contaminants.
- C. Place towel or other absorbent material on widow sill or sash to absorb moisture accumulation generated by film application.

3.3 INSTALLATION

- A. Install window films per manufacturer's written instructions.
 - 1. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) from window sealant.



2. Edge Seal (to protect from edge corrosion) – None required. 3M Ultra Prestige Window Films do not contain metals.
3. Use water and film slip solution on window glass and adhesive to facilitate proper positioning of film.
4. Use polyplastic bladed squeegees to insure efficient removal of excess water from underside of film and to maximize bonding of pressure sensitive adhesive.
5. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

3.4 CLEANING

- A. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.
- B. After installation, remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.

END OF SECTION