

# SPECIFICATIONS FOR SCOTCHGARD™ ANTI-GRAFFITI WINDOW FILM

## 1.0 Scope

This specification is for a graffiti resistant and abrasion resistant window film which when applied to the interior or exterior window surface will provide resistance to typical graffiti materials such as glass etchants, gauging and abrasion and reduce the ultra-violet light that normally would enter through the window by 98%. The film shall be called Scotchgard™ AG-4 or AG-7 Anti-Graffiti Window Film.

## 2.0 Applicable Documents

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

The 1985 American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals.

The American Society for Testing and Materials (ASTM) publication:

ASTM E-308 Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System

ASTM E-903 Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres

ASTM D-1044 Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test)

ASTM G-90 Standard Practice for Performing Accelerated Outdoor Weatherizing for Nonmetallic Materials Using Concentrated Natural Sunlight

ASTM E-162 Standard Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

ASTM E-662 Standard Method for Specific Optical Density of Smoke Generated by Solid Materials

Window 4.0, A Computer Tool for Analyzing Window Thermal Performance, Lawrence Berkeley Laboratory

## 3.0 Requirements of the Film

3.1 Film Material: The film material shall consist of an optically clear 4 mil (.004) or 7 mil (.007 inches) polyester film with a durable acrylic abrasion resistant coating over one surface and a pressure sensitive adhesive and liner on the other. The film color is clear and will not contain dyed polyester. There shall be no evidence of coating voids. The film shall be Identified as to Manufacturer of Origin (hereafter to be called Manufacturer).

3.2 Transmission - Visible: When applied to 1/4' (6mm) clear glass, the luminous transmittance shall be nominal when measured with an integrating sphere spectrophotometer as referenced by ASTM E-903 and calculated per ASTM E-308 using Standard Source 'C' for average daylight.

3.3 Reflection - Visible: When applied to 1/4' (6mm) clear glass, the total luminous reflection from the glass surface shall be nominal when measured with an integrating sphere spectrophotometer as referenced by ASTM E-903 and calculated per ASTM E-308 using Standard CIE Source 'C' for average daylight.

# SPECIFICATIONS FOR SCOTCHGARD™ ANTI-GRAFFITI WINDOW FILM

3.4 Transmission - Ultraviolet Light: When applied to 1/4' (6mm) clear glass, the total transmission of solar ultraviolet radiation of air mass = 2 over the spectral range of 3000 to 3800 angstroms shall not exceed when measured with an integrating sphere spectrophotometer as referenced by ASTM E-903.

3.5 Adhesive System: The film shall be supplied with a high mass pressure sensitive weatherable acrylate adhesive applied uniformly over the surface opposite the abrasion resistant coated surface. The adhesive shall be essentially optically flat and shall meet the following criteria:

a. Viewing the film from a distance of ten feet at angles up to 45 degrees from either side of the glass, the film itself shall not appear distorted.

3.6 Abrasion Resistance: The Manufacturer shall provide independent test data showing that the film has a surface coating that is resistant to abrasion such that, less than 5% increase of transmitted light haze will result in accordance with ASTM D-1044 using 100 cycles, 500 grams weight, and the CS I OF Calbrase Wheel.

## **4.0 Requirements of the Authorized Dealer/Applicator ADA)**

4.1 The ADA shall provide documentation that the ADA is certified by the Manufacturer of the window film to install said window film as per the Manufacturer's specifications and in accordance with specific requests as to be determined and agreed to by the customer.

4.2 Authorization of dealership may be verified through the company's 3M ID Number.

## **5.0 Requirements of the Manufacturer**

5.1 The Manufacturer will insure proper quality control during production, shipping and inventory, clearly identify and label each film core with the product designation and run number.

5.2 The Manufacturer will, upon request and pre-approval, provide 10096 financing for the complete installation of the window film to the end-user customer in either an installment purchase or lease purchase format to be deckled upon by customer.

5.3 Materials shall be manufactured by: 3M Consumer Safety and Light Management  
Department  
3M Center, Building 223-2N-21  
St. Paul, MN 55144-1000  
Phone: 800-480-1704

## **6.0 Warranty**

6.1 Scotchgard Anti-graffiti films are warranted for a period of 6 months when installed outdoors and for a period of 10 years when installed indoors.

# SPECIFICATIONS FOR SCOTCHGARD™ ANTI-GRAFFITI WINDOW FILM

## 7.0 Application

- 7.1 Outdoor application should be done when the air temperature is not expected to fall below 32 degrees F, or 0 degrees C for 72 hours. Indoor application should be done when the glass temperature is not expected to fall below 32 degrees F, or 0 degrees C for 72 hours.
- 7.2 Examination: Examine glass surfaces to receive new film and verify that they are free from defects and imperfections, which will affect the final appearance. Correct all such deficiencies before starting film application.
- 7.3 Preparation:
- a. The window and window framing will be cleaned thoroughly with a neutral cleaning solution. The surface of the window glass shall be bladed with Industrial razors to insure the removal of any foreign contaminants.
  - b. Toweling or other absorbent material shall be placed on the window sill or sash to absorb moisture accumulation generated by the film application.
- 7.4 Installation: The film shall be applied as to the specifications of the Manufacturer by an ADA.
- a. Materials will be delivered to the job site with the manufacturer's labels intact and legible.
  - b. To minimize waste, the film will be cut to specification utilizing a vertical dispenser designed for that purpose. Film edges shall be cut neatly and square at a uniform distance of 1/8" to 1/16" of the window sealing device.
  - c. Water and film slip solution only will be used on the window glass to facilitate the proper positioning of the film.
  - d. To insure efficient removal of excess water from the underside of the film and to maximize bonding of the pressure sensitive adhesive, a 6" maximum width polyplastic bladed squeegee will be utilized. It is recommended that the final squeegee process be followed by a final push with a 5-way tool. This will ensure that a minimal amount of water is left behind.
  - e. Upon completion, the film may have a small number of small water pockets. These water pockets, under reasonable weather conditions, dry flat and disappear within a period of 30 calendar days when viewed under normal viewing conditions.
  - f. After installation, any left over material will be removed and the work area will be returned to original condition. Use all necessary means to protect the film before, during and after the installation.

## 8.0 Cleaning

The film may be washed using common window cleaning solutions, including ammonia solutions. Abrasive type cleaning agents and bristle brushes, which could scratch the film, must not be used. Synthetic sponges or soft cloths are recommended.

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<b><u>Scope</u></b>	<b><u>AG-4</u></b>	<b><u>AG-7</u></b>
Thickness		
(mils)	4.0	7.0
(inches)	.004	.007
Emissivity	0.87	0.87
U Value	1.09	1.09
Transmission-Visible	85%	85%
Reflection-Visible	10%	10%
Transmission-UV	<2%	<2%
Shading Coefficient	0.90	0.90
Shrinkage	No Detectable Shrinkage	
Tensile Strength	31k psi	28k psi
Adhesion	1500 gm/m <sup>2</sup>	1500 gm/m <sup>2</sup>
Removeability	Does not leave significant amount of adhesive when removed from glass.	
ANSI Z97 impact	150 ft lbs	400 ft lbs