

Product Description

3M™ Safety & Security Impact Protection Attachment (IPA) Sealant improves the overall performance of 3M™ Safety and Security Window Films. This window protection system combines the toughness of 3M Safety and Security Window film with an edge retention system to help shield against impact from a variety of sources including bomb blasts and forced entry events. The 3M Impact Protection System also helps protect against personal injury from flying glass.

3M Impact Protection Attachment (IPA) Sealant Benefits:

- Excellent tear, elongation and tensile strength
- Anchors the filmed glass to the window frame
- Enhances protection to help preserve the building envelope when the glass is shattered

Product Characteristics

Property	Test Method Used	Units	3M IPA
Curing Time (25°C (77°F), 50% RH)		Days	< 14
Full Adhesion	ASTM C 679	Days	> 14
Tack-Free Time (25°C (77°F), 50% RH)	ASTM C 639	Minutes	60-70
Flow, Sag or Slump		Inches	0.1
Working Time (25°C (77°F), 50% RH)		Minutes	10-20
Specific Gravity		n/a	1.4
VOC Content		g/l	30
As Cured – After 7 days at 25°C (77°F), 50% RH			
Ultimate Tensile Strength	ASTM D 412	psi (MPa)	350 (2.41)
Ultimate Elongation	ASTM D 412	%	525
Durometer Hardness, Shore A	ASTM D 2240	Points	40
Peel Strength	ASTM D 794	ppi	40
Tear Strength, Die B	ASTM D 624	ppi	49

Specifications

1.0 Scope

This specification is for a window film attachment system, or “wet glaze” to anchor the film to the frame. The attachment system helps secure filmed broken glass in the window frame, thus providing an increased level of safety and security for a broad range of applications, including basic glass fragment retention, spontaneous glass breakage, seismic preparedness, building envelope protection, bomb blast mitigation, Smash and Grab or Break and Entry events. The wet glaze shall have low VOC content, low odor, and fast cure time. The film attachment system is called **3M Impact Protection Attachment (IPA) Sealant**.

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 American Society for Testing and Materials (ASTM):

- ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
- ASTM D 2240 – Standard Test Method for Rubber Property – Durometer Hardness.
- ASTM D 624 – Standard Test Method of Test for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- ASTM C 639 – Standard Test Methods for Rheological (Flow Properties) of Elastomeric Sealants.
- ASTM C 679 – Standard Test Method for Tack Free Time of Elastomeric Sealants.
- ASTM C 794 – Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
- ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure.
- ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- ASTM F-1642 Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings.
- ASTM F-2912 Standard Specification for Glazing and Glazing Systems Subjected to Airblast.

GSA-TS01-2003 General Services Administration Standard Test for Glazing and Glazing Systems Subject to Airblast Loadings.

3.0 IPA Sealant Requirements

3.1 Color (select one):

- a. Black
- b. White
- c. Gray

3.2 Material Properties (as supplied):

- a. Typical Cure Time: < 14 days (25°C, 50% RH)
- b. Full Adhesion: < 21 days
- c. Tack-Free Time (ASTM 679): 60-70 minutes (25°C, 50% RH)
- d. Flow, Sag or Slump (ASTM C 639): 0.1 in.
- e. Specific Gravity: 1.4
- f. Working Time: 10–20 minutes (25°C, 50% RH)
- g. VOC Content: 30 g/L

3.3 Material Properties (as cured – 21 days at 25°C, 50% RH):

- a. Ultimate Tensile Strength (ASTM C 1135): 170 psi (1.17 MPa)
- b. Tensile at 50% Elongation (ASTM C 1135): 65 psi (0.43 MPa)
- c. Tensile at 25% Elongation (ASTM C 1135): 43 psi (0.30 MPa)
- d. Durometer Hardness, Shore A (ASTM D2240): 40 points

3.4 Uniformity: Product shall have uniform consistency and appearance, with no clumping.

3.5 Impact Protection and Pressure Cycling

- a. As part of a filmed glass system, film attachment shall demonstrate ability to withstand Medium Large Missile C and Small Missile A impact, with subsequent pressure cycling (per ASTMs E 1996 and E 1886) at ± 70 psf design pressure.
- b. As part of a filmed glass system, film attachment shall demonstrate ability withstand structural load requirements of ASTM E330 when tested at ± 120 psf design pressure.

3.6 Bomb Blast Mitigation:

- a. GSA Rating of “2” (Minimal Hazard) with minimum blast load of 8 psi overpressure and 60 psi*msec blast impulse.
- b. GSA Rating of “3A” (Low Hazard) with minimum blast load of 9 psi overpressure and 66 psi*msec blast impulse.

4.0 Requirements of the Authorized Dealer/Applicator (ADA)

- 4.1 The ADA shall provide documentation that the ADA is certified by the Manufacturer to install 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.

- 4.3 The ADA will provide a commercial building reference list of ten (10) properties where the ADA has installed window film. This list will include the following information:

- Name of building
- The name and telephone number of a management contact
- Type of attachment system
- Amount of attachment systems installed
- Date of completion

5.0 Requirements of the Manufacturer

- 5.1 The Manufacturer will ensure proper quality control during production, shipping and inventory, clearly identifying each product unit with the product designation and run number.

- 5.2 Materials shall be manufactured by:
Commercial Solutions Division
3M Center, Building 220-12W
St. Paul, MN 55144-1000

6.0 Application

- 6.1 **Examination:** If application of window film is (was) the responsibility of another installer, notification in writing shall be made of deviations from manufacturer’s recommended installation tolerances and conditions.

- a. Filmed glass surfaces receiving new attachment should first be examined to verify that they are free from defects and imperfections, and that the film edges extend sufficiently to the frame edges.
- b. Do not proceed with installation until film and frame surfaces have been properly prepared and deviations from manufacturer’s recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- c. Upon the customer’s request, an adhesion test to the frame surface may be conducted by applying a 4 - 6 in. long bead, approximately 0.5 - 1 in. in width, masking one side of the frame surface underneath the strip with tape. Allow the IPA Sealant to cure for 7 days and test adhesion by pulling up on the masked end and a 90° angle. If cohesive failure is observed (sealant residue left behind on the frame surface), adhesion is acceptable; if sealant failure is observed (clean peel from the frame), adhesion is unacceptable and product is not recommended.

6.2 Preparation:

- Clean surfaces thoroughly prior to installation.
- Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- Installer shall take necessary precautions to protect interior furnishings.

6.3 Installation: The film attachment system shall be applied according to the specifications of the Manufacturer by an Authorized Dealer/Applicator.

- For blast mitigation: minimum 1/2 in. bead overlap on both frame and film (excluding glazing stops or compression gaskets)
- For windborne debris protection: minimum 3/8 in. bead overlap on both frame and film (excluding glazing stops or compression gaskets)
- To ensure a straight and consistent bead width is achieved, masking tape may be applied to film and frame surfaces before application of 3M IPA Sealant.
- With prior approval of the building owner or property manager, existing compression gaskets may be partially removed or trimmed to allow for a thinner bead and stronger anchorage. If removing the gaskets, sections shall be trimmed approximately 3 inches in length and inserted with appropriate spacing along all sides of the window to help.
- The IPA Sealant shall be dispensed with a caulk gun with nozzle opening diameter sized to match the approximate size of the approximate size of the desired bead width.
- A plastic putty knife or other tool with a clean straight edge shall be used to trowel and smooth out the sealant. The complete sealant bead shall be relatively triangular in shape.
- Any masking tape used shall be carefully removed within 10 minutes after applying the wet glaze.

7.0 Cleaning

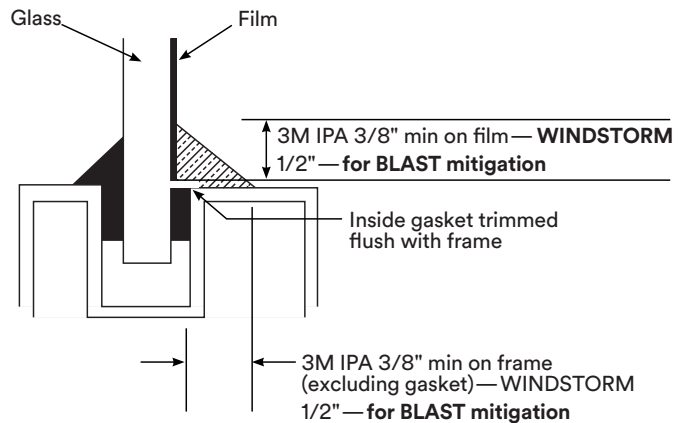
- Product shall be allowed to cure for at least 14 days.
- Any visibly defective sections shall be repaired prior to the substantial completion of work.
- Uncured or excess material on film or frame shall be removed using a cloth dampened with isopropyl alcohol.
- Common window cleaning solutions may be used within 30 days after installation.

8.0 Warranty

The application shall be warranted by the manufacturer (3M) for a period of ____ years from the date of installation. Warranty only applies to new 3M Safety and Security Film installations. The manufacturer warrants that the Impact Protection Sealant will maintain its integrity and will not change color from the time of original installation. Warranty

does not cover failure due to disintegration of the underlying substrate, movement of the structure exceeding specification for elongation and/or compression, or changes in appearance due to dirt, contaminants, or tampering.

Figure 1.



3M IPA Sealant

Installation Instructions

- Apply a 1 in. (25 mm) strip of 3M™ Scotch™ Safe Release™ Blue Masking Tape to the film surface 3/8 in. (9 mm) in from the edge of the film to all four sides. Note: This dimension will depend on application—1/2 in. or 3/8 in.
- Apply a 1 in. (25 mm) strip of 3M Safe-Release Blue Masking Tape to the window frame 3/8 in. (9mm) from the edge of the trimmed gasket. **Note:** This dimension will depend on application—1/2 in. or 3/8 in. This will form a parallel sealant channel that will allow a uniform sealant bead to be applied to the glass/frame interface. Note: Use a clean drop cloth before proceeding to the next step.
- Apply a triangular bead of IPA Sealant, and tool as needed to form an acceptable finish. Read and follow all product information and installation instructions provided by 3M Company. We recommend you start in a corner and apply the sealant bead out approximately 6 in. Then turn the gun and push the sealant bead to the next corner where the same method is repeated. Pushing the sealant bead will ensure proper penetration and minimize the chances of air gaps in the bead. Pulling the gun can also be done if confident no air gaps are formed.
- Smooth the sealant bead with an appropriate tool, if necessary, to give a finished look. Tooling should be completed in one continuous stroke immediately after sealant application and before a skin forms.
- Carefully remove the two masking strips from the glass/frame immediately after tooling. Do not allow the excess sealant to contact the film, frame or flooring surfaces. A light colored drop

3M™ Impact Protection Attachment Systems

cloth is needed to protect the work area. Be careful not to step on sealant and transfer it to surrounding surfaces.

Note: Should you get some of the sealant on the surrounding surfaces, an application and gentle wipe with a 3M Citrus Based Cleaner is recommended. Consult local air quality rules before use.

Curing time for the IPA Sealant will vary depending on temperature and relative humidity. It is not recommended to clean the film/IPA system for at least 36 hours following the installation. Full curing/adhesion can take up to 14 days, depending on conditions.

Product Characteristics

Property	Test Method Used	Units	3M IPA
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Flow, Sag or Slump		Inches	0.1
Working Time (25°C (77°F), 50% RH)		Min-utes	10-20
Specific Gravity		NA	1.40
VOC Content		g/l	30
As Cured – After 21 days at 25C (77F), 50% RH			
Tensile Strength at 50%	ASTM C 1135	psi	75
Joint Movement Capability	ASTM C 719	%	± 50
As Cured- After 21 days at 25°C (77°F), 50% RH and 4500 hours of QUV ASTM G-53	ASTM G 53		
Tensile Strength at 50%	ASTM C 1135	psi	78

Bomb Blast and Windstorm Testing results available upon request.