

**IMPORTANT:** This Technical Data Sheet provides an overview of product performance. Prior to product selection you should refer to the current 3M Technical Specifications for more detailed product information and specifications.

## Product Features and Benefits

- Micro-layered film designed for tear resistance
- Optically clear
- Applies to interior glass surfaces
- Helps protect from broken glass hazards
- Helps extend the life of furnishings by significantly reducing harmful UV rays

## Applications

- Bomb Blast Mitigation
- Safety Glazing
- Helping to Deter Break & Entry
- Building Envelope Protection
- Spontaneous Glass Breakage
- Seismic Preparedness

## Film Properties (typical)

Film Thickness	8 mils (203μ) nominal *
Film Construction	Micro-layered
<b>Tensile Properties (ASTM D882)</b>	
Tensile Strength	31,500 psi
Break Strength	253 lbs/in
Elongation at Break	135%
Yield Strength	15,000 psi
Elongation at Yield	8%
Modulus	520 kpsi
<b>Other Physical Properties</b>	
Graves Area Tear Resistance (ASTM D1004)	1,100 lbs% (MD) /1,050 lbs% (TD)

Puncture-Propagation-Tear Resistance (ASTM D2582)	9 lbf (MD) /11 lbf (TD)
Puncture Strength (ASTM D4830)	190 lbf
Abrasion Resistance (ASTM D1044)	2.3% Δ haze
Peel Strength (ASTM D3330)	9 lb/in
Flammability (ASTM E84)	Class A
<b>Solar Properties – film applied to 1/4" clear glass</b>	
Visible Light Transmitted	87%
UV Light Rejected	99%

\* Total thickness with adhesive is 9mils (230 μ)

## Performance Testing

Method	Glass Substrate *	Film Attachment **	Blast Load	GSA Performance Condition and/or ASTM Hazard rating
<b>Blast Mitigation</b>				
GSA TS01-2003 ASTM F1642	1/4" annealed	IPA	6 psi, 42 psi msec	GSA Rating of "2" ASTM F1642 "No Hazard"
GSA TS01-2003 ASTM F1642	1" double pane annealed	IPA	6 psi, 42 psi msec	GSA Rating of "2" ASTM F1642 "No Hazard"
GSA TS01-2003 ASTM F1642	1" double pane annealed	IPA	9 psi, 60 psi msec	GSA Rating of "2" ASTM F1642 "No Hazard"
GSA TS01-2003 ASTM F1642	1/4" tempered	IPA	6 psi, 42 psi msec	GSA Rating of "2" ASTM F1642 "No Hazard"
GSA TS01-2003 ASTM F1642	1" double pane tempered	IPA	9 psi, 60 psi msec	GSA Rating of "2" ASTM F1642 "No Hazard"
GSA TS01-2003 ASTM F1642	1" double pane tempered	IPA (2 sides)	6 psi, 42 psi msec	GSA Rating of "3a" ASTM F1642 "Minimal Hazard"
GSA TS01-2003	1/4" tempered	IPA	7.67 psi, 52 psi msec	GSA Rating of "2"
GSA TS01-2003	1/4" tempered	IPA (2 sides)	6 psi, 42 psi msec	GSA Rating of "3a"
GSA TS01-2003	1" double pane tempered	IPA	7.8 psi, 55 psi msec	GSA Rating of "2"
GSA TS01-2003	1" double pane tempered	IPA (2 sides)	6.5 psi, 48 psi msec	GSA Rating of "3a"
GSA TS01-2003	1/4" annealed	IPA	9.4 psi, 55 psi msec	GSA Rating of "3b"
GSA TS01-2003	1" double pane annealed	IPA (2 sides)	6.84 psi, 45 psi msec	GSA Rating of "3b"

Method	Glass Substrate	Film Attachment **	Rating
<b>Safety Glazing</b>			
16 CFR 1201	1/4" & 1/8" annealed	--	Category 2, 400 ft-lbs and Category 1, 150 ft-lbs
ANSI Z97.1			Class A (Unlimited), 400 ft-lbs and Class B (Unlimited), 150 ft-lbs
<b>Impact Resistance</b>			
ASTMs E1886 / E1996	1/4" tempered	IPA	Missile Level C +/- 75 psf
ASTMs E1886 / E1996		IPA	Missile Level A +/- 75 psf

\* Based on dry lamination of film to single pane glass and wet lamination of film to double pane insulated glass units.

\*\* IPA = 3M™ Impact Protection Attachment Sealant, all 4 sides unless noted.

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**Commercial Solutions Division**

3M Center, Building 220-12E-04 St. Paul, MN 55144

3M.com/windowfilm

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