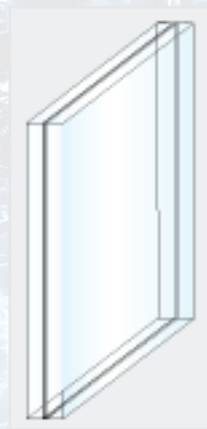


# HALO™ GLASS

is manufactured by Midwest Glass Fabricators (MWGF) using several materials layered together in varying configurations to achieve specific levels of security. Each level is Underwriters Laboratory (UL) or National Institute of Justice (NIJ) tested and rated for effectiveness in impeding specific projectiles. The level of protection should be matched to the asset being protected. If you are protecting property assets against simple smash and grabs, then impactresistant glass could be the least expensive option that you might require. But, if you are protecting priceless property and people's lives, you will want to explore the benefits of bullet-resistant glass. It could be the difference between life and death.



**SAFETY-GLASS** is two layers of glass with Polyvinyl Butyral (PVB) or Security Guard (SGP) in the middle. It is designed to protect from unintentional impacts.



**IMPACT-RESISTANT** glass is two layers of glass with a laminated interlayer designed to slow an intruder's progress. It does not stop bullet penetration but will provide resistance to impact from objects such as rocks and sledgehammers. This will protect, for a time, property in the event of specific glass shattering impacts. This will not provide bullet resistance.



**BULLET-RESISTANT** glass is made with multiple layers of laminated glass and is designed to displace the energy of ballistic rounds like those of handguns, assault rifles and automatic weapons, flattening or catching the bullet(s) and preventing them from penetrating. This will offer the highest level of protection to both property and people.

Bullet-resistant glass is designed to be installed in conjunction with bullet-resistant architectural framing for the maximum effectiveness. Please note, when bulletproof glass is installed without reinforced framing, or when existing plain glass is only retrofitted with a protective film, a highly secure, bullet-resistant environment is not established.

*Midwest Glass Fabricators was founded in 1989 with a mission of Service, Security and Speed. More than 30 years later our dedication to our clients, and being on the forefront of our growing industry, is still our number one focus.*

*As a leading manufacturer of glass products in the Midwest, our extensive offering includes a complete line of HALO™ safety and security glass, manufactured in our state-of-the-art facility in Highland, Michigan under the most stringently controlled environment with the highest-quality materials available.*

*Architects and contractors rely on us to assist with large commercial and residential projects. Our experienced safety experts will design a custom security solution to meet the level of threat that their project requires.*

*We take great pride in our reputation as a leader in the industry and we look forward to earning your business.*

*Please contact our bullet-resistant glass specialists for expert answers to your questions and guidance to the best safety solutions:*

**Kyle Liedel** | 248.889.6237 | [kliedel@mwgf.com](mailto:kliedel@mwgf.com)  
**Paul Mouton** | 248.249.0478 | [pmouton@mwgf.com](mailto:pmouton@mwgf.com)



100 Transfer Drive, Highland, Michigan 48357 | 1-800-245-5457 | [mwgf.com](http://mwgf.com)



## HOW MUCH PROTECTION IS ENOUGH?

100 Transfer Drive, Highland, Michigan 48357 | 1-800-245-5457 | [mwgf.com](http://mwgf.com)





# MIDWEST GLASS FABRICATORS (MWGF)

has been on the forefront of the constantly evolving glass market for over 30 years. Our product line includes HALO™, which is a full line of safety and security products for architects and contractors needing solutions with an unprecedented level of safety and security.

There are companies selling window film and marketing it as a security solution. Before you consider this option, read the 3 common myths below and then ask yourself, are you protecting just property? Or people? Our goal is to educate you on the different levels of protection so that you can choose the security that meets your needs.

## MYTH #1 – “BULLETPROOF” GLASS EXISTS

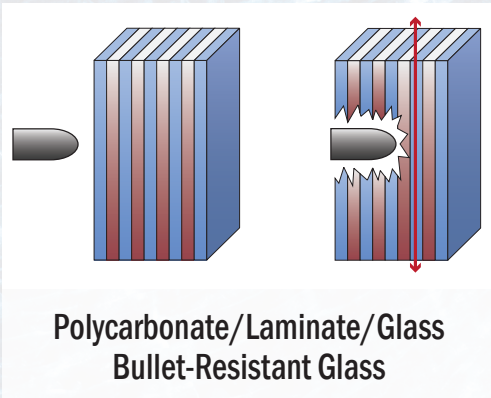
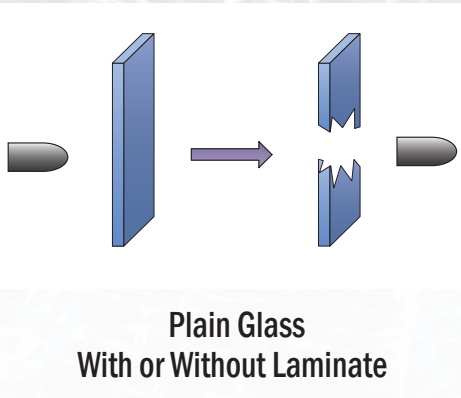
When we hear the term “bulletproof glass” we think of something impenetrable by bullets and perfectly safe for us for as long as we remain separated from our attackers by the structure. This is a myth because the truth is no glass is completely impenetrable by bullets. The proper term for even the strongest of security glass is “bullet-resistant” glass. This means the glass constitutes a barrier that delays bullet penetration. In other words, it would take multiple bullets to breach the barrier. The caliber and velocity it takes to breach the glass depends on the thickness and material makeup of the barrier and the type of firearm being used. UL (Underwriters Laboratory) has developed the most widely-accepted set of quality standards for bullet-resistant glass. The classification of resistance is based upon how many shots and from what caliber weapon it takes to penetrate the glass. There is no such thing as BULLETPROOF glass.

## MYTH #2 – GLASS FILM STOPS BULLETS

Glass films are not bullet-resistant by themselves. They only prevent spalling, which is fragmenting and spreading of glass towards the protective side of the glass, which prevents injury from flying glass in an attack. It is not bullet-resistant.

## MYTH #3 – LAMINATED GLASS IS BULLET-RESISTANT

Laminated glass with a regular interlayer Polyvinyl Butyral (PVB) is not bullet-resistant, it is safety-glass. It is simply glass that holds together when shattered, creating a spider web cracking pattern and preventing the glass from breaking into pieces. It is not bullet-resistant.



# HALO™ PRODUCTS

have undergone stringent UL and National Institute of Justice (NIJ) tests to be certified to UL 752, the Standard(s) for Bullet-Resistant Glass.

How is bullet-resistant glass measured? Bullet-resistant glass is tested using a gun to fire a projectile from a set distance into the material, in a specific pattern. Levels of protection are based on the ability of the target to stop a specific type of projectile traveling at a specific speed. When projectiles do not penetrate, the depth of the dent left by the impact can be measured and related to the projectile’s velocity and thickness of the material. The images below demonstrate 3 levels of HALO™ Glass, each capable of withstanding security threats of different magnitudes:



**LEVEL 2 - UL Standard:** Level 2 bullet-resistant glass must withstand 3 shots from a .357 Magnum with jacketed lead soft point bullets.

**LEVEL 4-5 - UL Standard:** Level 4-5 bullet-resistant glass must withstand 1 shot from a .30 caliber rifle with lead core ammunition or 1 shot from a 7.62 mm rifle with lead core full metal copper jacket military ball ammunition.

**LEVEL 6 - UL Standard:** Level 6 bullet-resistant glass must withstand 5 shots from a 9mm with full metal copper jacket with lead core ammunition.

# LEVELS OF BULLET-RESISTANT SECURITY GLASS

HALO™ Glass is manufactured at 14 certified levels, each with varying thicknesses and configurations of glass, polycarbonates and laminates, designed to withstand different levels of ballistic attack. All HALO™ glass is tested and certified to the critical UL and NIJ standards. Understanding the varying threat levels is critical to choosing the correct protection for your needs.

## LEVEL 1 RATED BULLET-RESISTANT GLASS SUITED FOR SMALL BUSINESSES AS A CRIME DETERRENT.

- Approx. .60” thick
- 7.7 lbs/sq ft
- Able to withstand fire from small caliber handguns
- Must resist three 9mm shots at 1175 f/s



## LEVEL 2 IS DESIGNED FOR BUSINESSES WITH A HIGHER-LEVEL OF SECURITY THREAT, SUCH AS JEWELERS AND FINANCIAL INSTITUTIONS.

- Approx. 1.17” thick
- 8.5 lbs/sq ft
- Able to withstand fire from large caliber handguns
- Must resist three shots of .375 Magnum soft point shots at 1250 f/s



## LEVEL 3 GLASS IS FOR MORE STRINGENT SECURITY NEEDS SUCH AS GOVERNMENT/SCHOOL BUILDINGS AND OTHER PUBLIC BUILDINGS.

- Approx. 1.32” thick
- 7.7 - 8.10 lbs/sq ft
- Able to withstands larger caliber handgun shots
- Must resist three .44 Magnum shots at 1350 f/s



## LEVELS 4-8 OFFER COMPARABLE PROTECTION LEVELS FOR THE HIGHEST RISK SITUATIONS SUCH AS SCHOOLS, MILITARY OPERATIONS & VEHICLES, POLICE, PRISONS AND FEDERAL BUILDINGS.

- Approx. 1.25” – 3” thick
- 11.68 - 29.3 lbs/sq ft
- Withstands assault rifles and automatic weapons
- 4: Must resist one .30 caliber rifle shot at 2540 f/s
- 5: Must resist one 7.62 caliber rifle FMJ shot at 2750 f/s
- 6: Must resist five 9mm shots at 1400 f/s
- 7: Must resist multiple 7.62 caliber rifle FMJs at 3080 f/s
- 8: Must resist five 7.62 caliber rifle rounds at 2540 f/s

