

**iKABADI**



# Vertically Integrated Production

1

2

3

4

5

**CUTTING**

**TEMPERING**

**LAMINATION**

**AUTOCLAVE**

**FINISHED  
PRODUCT**

**FORMING**

- Cutting
- CNC for precise and odd shapes
- Waterjet

**HEAT TREATMENT**

- Strengthening of glass through heat strengthened or fully tempering process

**BONDING**

- Laying up of different materials and partially curing of interlayers to bond the materials in place

**CURING**

- Using a heat and high pressure while utilizing vacuum to fully cure a laminated product

**COMPLETION**

- Quality checking for defects
- Packing and Crating

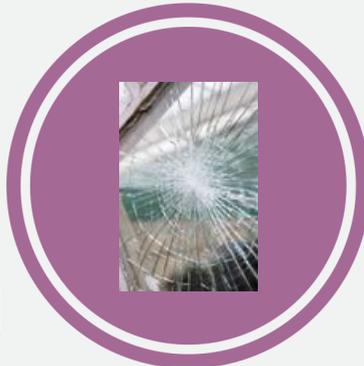


# Our Solutions

## ANTI-BANDIT

### GLASS

Tested to EN356 from P4A to P8B



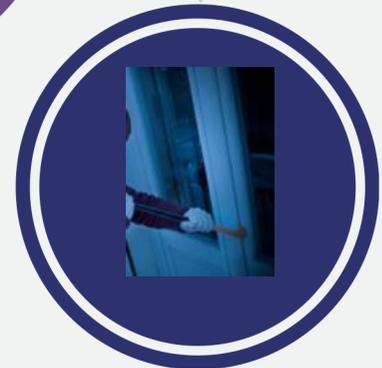
## BULLET RESISTANT WINDOWS & DOORS

Tested to EN1522 FB4. FB5, FB6 is in progress



## FORCED ENTRY WINDOWS & DOORS

Tested EN1627 RC3



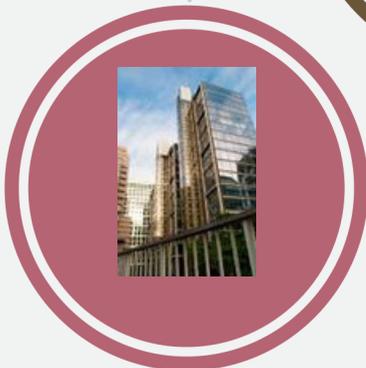
## BLAST RESISTANT GLASS

Tested to EN13541 standards from ER1 to ER4



## ARCHITECTURAL SAFETY GLASS

Tempered and laminated glass tested to EN12600 and SS341



# BallisticShield™



**Uncompromising Strength:** Our ballistic resistant glass are constructed using advanced materials that offer exceptional resistance to ballistic threats. With multiple layers of specially formulated glass and composite materials, they provide robust defense against high caliber projectiles.

**Lightweight and Thin:** Specialized type of ballistic resistant glass that offers protection against bullets and projectiles while minimizing the overall weight and thickness of the glass.

**Clarity and Transparency:** Our glass are designed to maintain optimal clarity without compromising on security. Experience the perfect balance between transparency and protection, enabling you to monitor surroundings without hindrance.

# Ballistics Standards



produces transparent armour in-house in our facility based in Singapore that meets the specifications for CEN EN 1063, STANAG 4569 (AEP-55), NIJ 0108.01 and UL752.

**R&D:** Continuous research and testing new materials to create thinner and lighter solutions and yet provides robust and exceptional performance against high caliber rounds.

**Custom Ballistic Requirements:** Designing transparent armour according to vehicle performance requirements, be it weight, performance and integrity in high and low temperature environments and against multi-hit threats

Tested and certified to international standards



# Ballistics Standards

Standard	Classification	No. of Shots	Protection	Projectile	Area Density	Thickness	Spalling Protection
UL752	Level 3	3		44 Magnum lead semi-wadcutter gas checked	53.3 kg/m <sup>2</sup>	26mm	Yes
UL752	Level 7	5		5.56 mm rifle full metal copper jacket with lead core	68.9 kg/m <sup>2</sup>	35mm	Yes
UL752	Level 8	5		7.62 mm rifle lead core full metal copper jacket, military ball	124.4 kg/m <sup>2</sup>	59mm	Yes
NIJ 0108.01	Type III	5		7.62 mm 308 Winchester FMJ	97.8 kg/m <sup>2</sup>	46mm	Yes
NIJ 0108.01	Type IV	1		30-06 Armor Piercing	160 kg/m <sup>2</sup>	75mm	Yes
EN1063	BR4	3		.44 Rem.Mag., FJ(2)/FN/SC	37 kg/m <sup>2</sup>	24mm	Yes
EN1063	BR5	3		5.56 x 45, type FJ/PN/SCP1	74.6 kg/m <sup>2</sup>	38mm	Yes
EN1063	BR6	3		7.62 x 51, type FJ/PB/SC	85 kg/m <sup>2</sup>	43mm	Yes
STANAG 4569	Level 1	3		7.62 x 51 NATO Ball (Ball M80)5.56 x 45 NATO SS109 5.56 x 45 M193	81 kg/m <sup>2</sup>	42mm	Yes
STANAG 4569	Level 2	3		7.62mm x39 API BZ	120 kg/m <sup>2</sup>	59mm	Yes

# BallisticShield™



Strike Face, sample 23SA01605 after test 23MB01320



Back Face, sample 23SA01605 after test 23MB01320

## NATO STANAG 4569 / AEP55

**Level 1** - 7.62mm x 51 NATO Ball, 5.56mm x 45 NATO SS109, 5.56mm x 45 M193

- STANAG 4569 Level 1 establishes the lowest level of ballistic protection defined by the standard. It provides protection against low-level threats that military vehicles and personnel carriers might encounter in modern combat scenarios.
- Glass comes with anti-spalling protection that protects its occupants from glass shards and shrapnel in the event of an attack.

## Technical data:

- Thickness: 42mm
- Areal Density: 81kg/m<sup>2</sup>
- 3 shot pattern

# BallisticShield™



Strike Face, sample 23SA01634 after test 23MB01323



Back Face, sample 23SA01634 after test 23MB01323

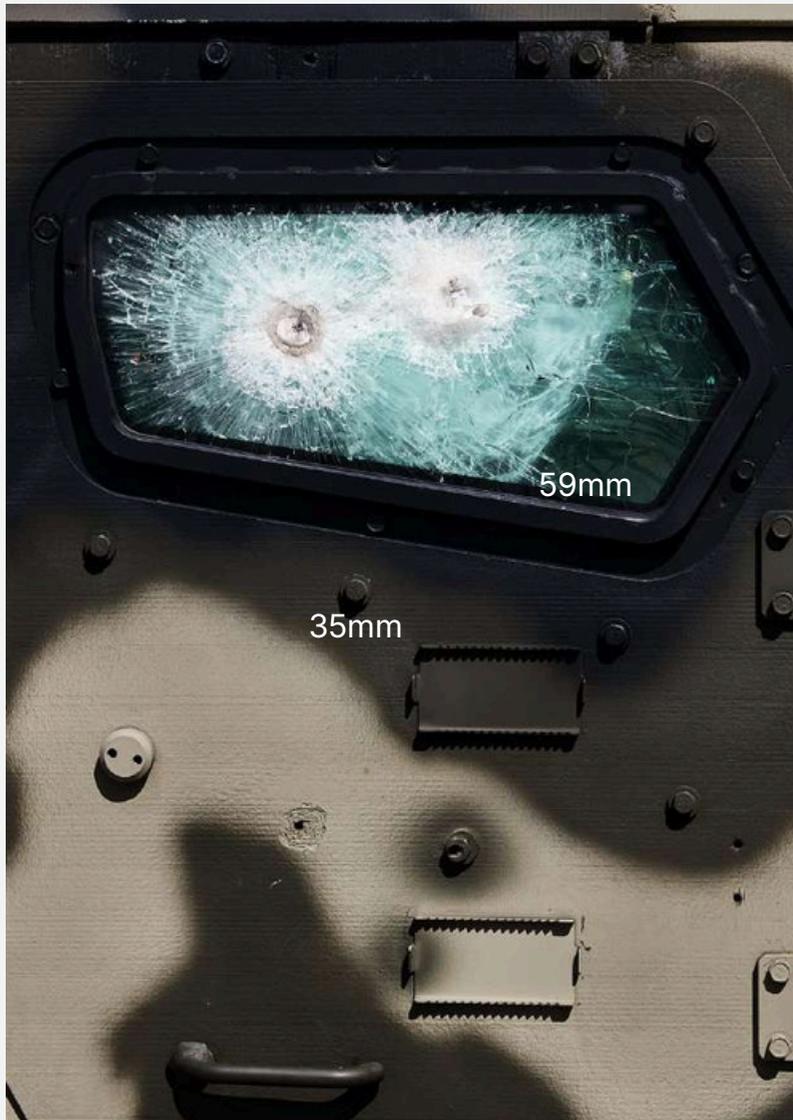
## NATO STANAG 4569 / AEP55 Level 2 - 7.62mm x39 API BZ

- Level 2 provides protection up to caliber 7.62 x 39mm with armor-piercing incendiary composition API ("Armor Piercing Incendiary").
- Glass comes with anti-spalling protection that protects its occupants from glass shards and shrapnel in the event of an attack.

### Technical data:

- Thickness: 59mm
- Areal Density: 120kg/m<sup>2</sup>
- 3 shot pattern

# BallisticShield™ New Lightweight Model



**Unmatched Strength-to-Weight Ratio:** By harnessing the power of cutting-edge composite materials, we have created glass that is significantly lighter than traditional alternatives. This breakthrough allows for seamless integration into various applications where weight reduction is critical, such as armored vehicles, aircraft, or portable security installations.

**Enhanced Ballistic Performance:** Our advanced composite materials deliver exceptional impact resistance, far surpassing the capabilities of conventional options. Through meticulous engineering, we have developed glass that can withstand the force of high-velocity projectiles, ensuring the highest level of security for personnel and assets.

# BallisticShield™ Lightweight



## NATO STANAG 4569 / AEP55

### Level 2 - 7.62mm x39 API BZ

- Level 2 provides protection up to caliber 7.62 x 39mm with armor-piercing incendiary composition API ("Armor Piercing Incendiary").
- Glass comes with anti-spalling protection that protects its occupants from glass shards and shrapnel in the event of an attack.

### Technical data:

- Thickness: 35mm
- Areal Density: 72kg/m<sup>2</sup>
- 3 shot Pattern

# BallisticShield™ Lightweight Comparison



**NATO STANAG 4569 / AEP55**  
**Level 2 - 7.62mm x39 API BZ**

Achieving a new generation of thinness and lightness

- **40% Weight Reduction**
- **40% Thickness Reduction**



# BallisticShield™ Lightweight



## NATO STANAG 4569 / AEP55 Level 3A - 7.62mm x54R B32 API

- Level 3A provides protection up to caliber 7.62 x 54R with armor-piercing incendiary composition API ("Armor Piercing Incendiary").
- Glass comes with anti-spalling protection that protects its occupants from glass shards and shrapnel in the event of an attack.

### Technical data:

- Thickness: 43mm
- Areal Density: 90kg/m<sup>2</sup>
- 3 shot pattern

# Edge Guard



**Protects against delamination:** Mitigates moisture and chemicals from penetrating the edge of the laminate.

**Longer Lasting Products:** Improved resistance to chemicals and solvent that can penetrate and damage the laminates

**Barrier against knocks:** Protects the edge from chips during handling and installation

Permanently bonded to the edges of our transparent armour solutions

# BallisticShield Windows & Doors



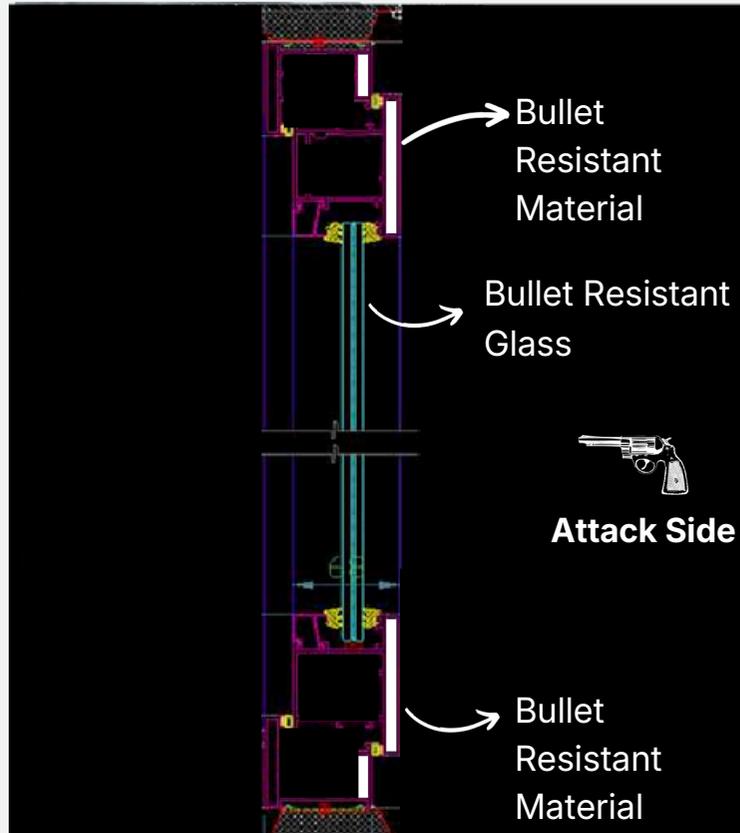
**Built lightweight and slim:** blending and fitting into the architectural designs of homes and offices, while withstanding high levels of threats from bullet attacks and intruders

**Engineered for easy installation:** ensuring a hassle-free process from start to finish

**Tested to ballistic resistant test standard EN1522:** Protection ranges from .44 magnum to 7.62mm caliber

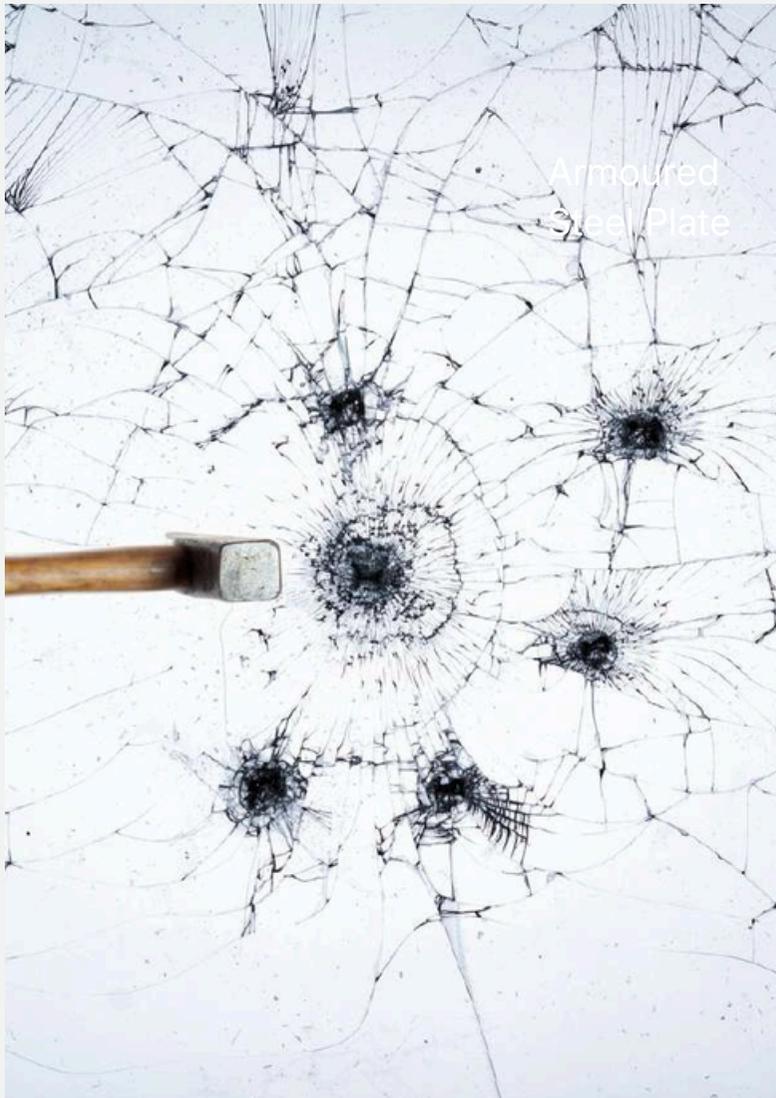
**Tested to EN1627 against forced entry**

# BallisticShield Windows & Doors



- The frames are specially designed to cover the weak spots of normal architectural frames, providing the same bullet proof protection as the glass.
- Special bullet resistant materials are incorporated into our slim aluminium profiles, providing bullet resistant without any penetration through the frames
- Only when the glass and frames comply to the same protection level, it will be considered a complete system
- Additional features can be added for heat and sound insulation

# Anti-Bandit



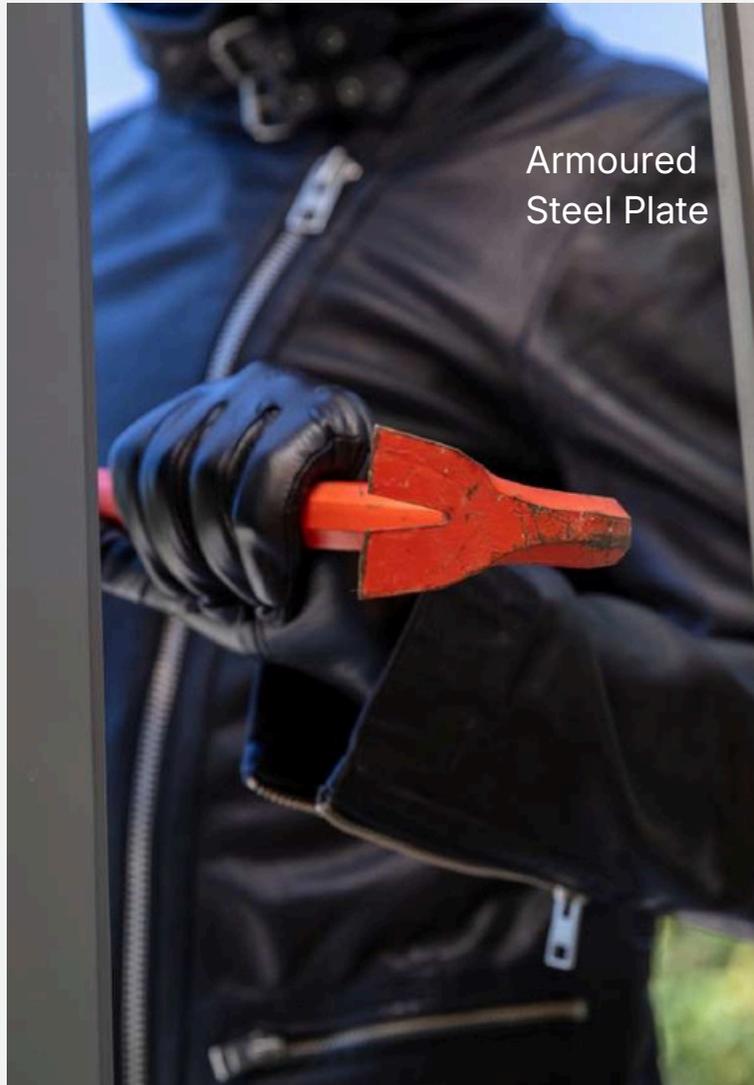
There are two categories for Anti-Bandit Glass. The first which is classified by a drop ball test (P4A & P5A), which is a simulation of objects thrown at a glass window.

The second classification would be a hammer and axe test (P6B, P7B & P8B), which simulates an actual burglar attempt to break into a glass window or shopfront.

## **EN356 Ball Drop, Hammer & Axe classification**

- P4A Level – 3 Ball Drops P5A
- Level - 9 Ball Drops P6B Level
- – 30 to 50 hits P7B Level – 51
- to 70 hits P8B Level – More
- than 70 hits

# Forced Entry Windows & Doors



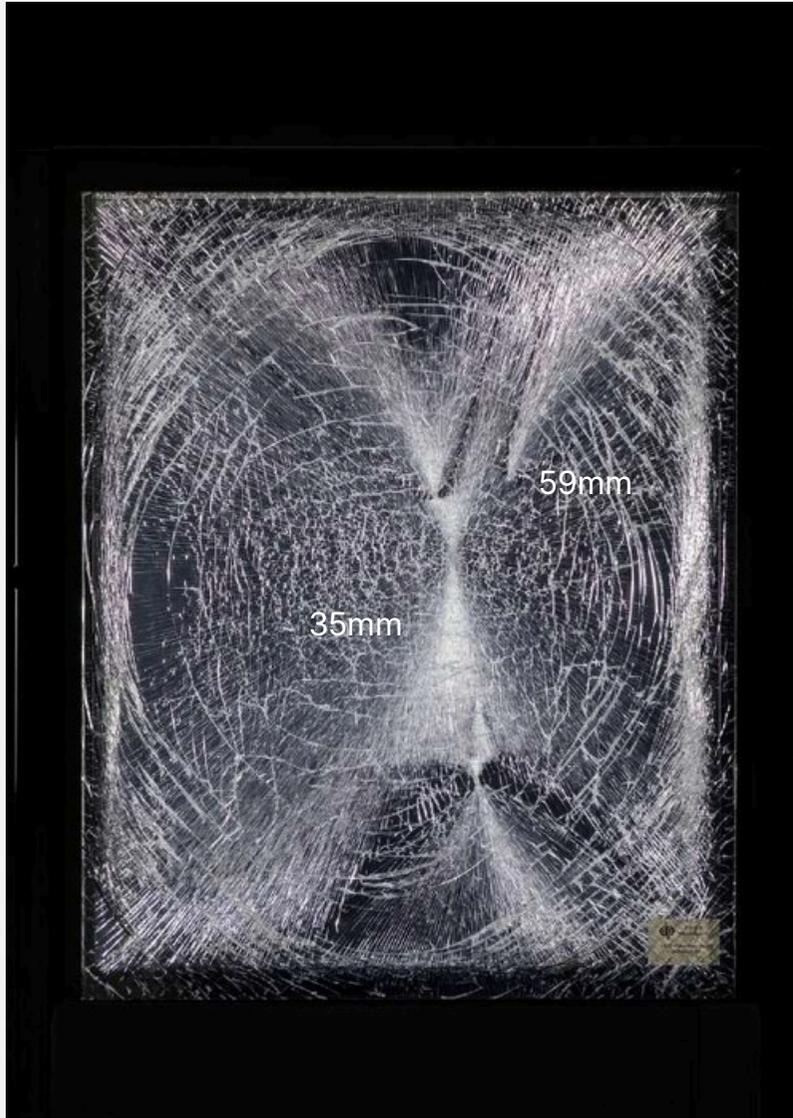
**Anti Bandit™ Doors and Windows** are a proprietary slim design produced in-house by us. It blends seamlessly as part of your secured area providing protection against forced entry attacks using tools such as crowbars, hammers and drills.

**Intruder Resistant Glass and Frames:** When the glass and frames comply to the same protection level, it will be considered a complete system

**Engineered for easy installation:** ensuring a hassle-free process from start to finish

**Tested to EN1627 Classification RC3** against forced entry

# BlastShield™



BlastShield™ is a blast resistant glass that uses laminating technology that helps to mitigate the threat from explosives through our unique glass and interlayers. It is tested to the European Standards EN13541.

With an anti-spalling feature, occupants are protected against shrapnel and glass shards in the event of a threat. It can be designed to meet specific blast threats from accidental, industrial or deliberate explosions.

**Advantages:** Thinner and Lighter design, with high optical clarity. Glass can be combined with solar control, thermal insulation or acoustic insulation in a single product.

# BlastShield™



## EN13541 - Glass in building - Security glazing - Testing and classification of resistance against explosion pressure

Classification	Area Density	Thickness	Peak Pressure	Spalling Protection
ER1	20 kg/m <sup>2</sup>	11mm	max. overpressure $50 \leq Pr < 100$ kPa	Yes
ER2	32 kg/m <sup>2</sup>	21mm	max. overpressure $100 \leq Pr < 150$ kPa	Yes
ER3	41 kg/m <sup>2</sup>	27mm	max. overpressure $150 \leq Pr < 200$ kPa	Yes
ER4	52 kg/m <sup>2</sup>	34mm	max. overpressure $200 \leq Pr < 250$ kPa	Yes

# Other Solutions

Kawasan Hunian Bisnis Terpadu CBD Pluit Jalan Pluit Selatan Raya 23/08  
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