



SAFETY GLASS

SAFETY AND DURABILITY

IN ALL CONDITIONS

www.tambest.com



SAFETY GLASS

Safety glass solutions offer superior security, durability, and reliability for both civilian and defense applications. With innovative design and advanced materials, they provide effective protection against vandalism, forced entry, explosions, ballistic threats, and electromagnetic interference.



Whether it's a building, vehicle, secure facility, or strategic area, our safety glass is tailored to meet even the most demanding security requirements. Our glass solutions not only safeguard against physical threats but also enhance privacy and reliably protect valuable assets.

The type testing of safety glass manufactured by Tambest Oy is conducted in external, accredited testing laboratories. This ensures that our products comply with international standards and regulations.

In addition to external testing, we follow rigorous internal inspection procedures, including visual inspections, precision measurements, and regular calibration of testing equipment.



IMPACT RESISTANCE

According to the SFS-EN 356 standard, refers to the glass's ability to withstand impacts and maintain its integrity.



BREAKING RESISTANCE

According to the SFS-EN 356 standard, refers to the ability of laminated layers to prevent penetration through the glass using breaking tools.



BALLISTIC PROTECTION

According to the SFS-EN 1063 standard, refers to the glass's ability to provide protection against projectiles of various calibers.



SIGNAL PROTECTION

The ability of a metal layer or special film to block the passage of electronic signals, such as radio frequencies and WLAN signals. This provides protection against electronic surveillance and interference.



EXPLOSION RESISTANCE

According to the ISO 16933 standard, the ability to withstand blast pressure waves and shrapnel, providing protection to the target both structurally and on a personal level.

COMBINING FEATURES

Versatile expertise and equipment enable various variations of safety glass, allowing the integration of special coatings, electrically heated surfaces, curved shapes, and PDLC smart film features.



VANDALISM AND BREAK-IN RESISTANT GLASS

SFS-EN 356 BUILDING GLASS.
SAFETY GLAZING.
BREAK-IN RESISTANCE TESTING AND
CLASSIFICATION.

Tambest vandalism and break-in resistant glass provide reliable protection against various external threats, such as vandalism and burglaries.

The safety and performance of this glass are defined by the European EN 356 standard, which classifies the glass based on its durability.

P1A-P5A

Suitable for protecting against light vandalism, such as the throwing of stones or small objects.

P6B-P8B

Designed to withstand more demanding break-in protection needs, such as repeated impacts with heavy tools.

APPLICATIONS

EN 356: GLASS IN BUILDING – RESISTANCE TO MANUAL ATTACK is a standard that defines the glass's resistance to vandalism and break-in attempts. This standard tests the glass's ability to prevent burglaries and breakage when attempted with manual tools, such as hammers, stones, saws, and other tools. This makes it a particularly important standard for protection applications where resistance to vandalism and break-ins is required.



Banks and financial institutions

The glass must prevent burglaries and protect both the premises and customers.



Public transport

Buses and trains, where glass can be used to protect passengers.



Public buildings and infrastructure

In buildings such as government offices, courthouses, and police stations, the glass must withstand attacks from vandalism and burglars.



Warehouses and industrial sites

Glass can be used to protect premises and property from break-ins and vandalism. It provides effective protection for windows, doors, and passageways.



Retail stores and department stores

Shops and department stores can use glass to protect products and entrances from burglaries and vandalism.



High-security areas

Glass can be used as part of the protection in research facilities, prisons, and other controlled environments.



BULLET-RESISTANT GLASS

SFS-EN 1063 BUILDING GLASS.
SAFETY GLAZING.

SAFETY WITHOUT COMPROMISE

Our SFS-EN 1063 classified bullet-resistant glass offers maximum protection, durability, and functionality, making it the ideal choice for environments where only the best will do. Designed and manufactured at Tambest Oy, our glass withstands impacts from various handguns and rifles, preventing bullet penetration while minimizing and containing spall on the protected side. Meeting strict international safety standards, our precision-controlled manufacturing ensures exceptional strength and full compliance. Durability is assessed under SFS-EN 1063, which tests glass with bullets of different sizes and calibers, classifying it by protection level.

TECHNICAL FEATURES:

Our bullet-resistant glass consists of multiple layers of special laminated glass and plastics, which:

- Distribute impact force over a wide area
- Prevent spall formation on the interior surface
- Ensure excellent optical clarity, even in thicker constructions

BULLET-RESISTANT GLASS ACCORDING TO SFS-EN 1063

The classification includes two main types:

BR CLASSES (Ballistic Resistance)

These classes assess the glass's ability to fully prevent bullet penetration.

NS Classes (Non-Splintering)

This additional classification indicates that the glass is designed to minimize spall formation upon impact. NS classification ensures that the glass either prevents spall entirely or reduces its spread, minimizing the risk of additional injuries to individuals behind the glass.

Classifications and their meanings:

BR-classes		NS-classes (Non-Splintering)	SG-classes
BR1	Protects against small-caliber firearms, like .22 caliber lead bullets.	The addition of the NS classification to a BR class indicates that the glass prevents spall formation or reduces its spread, minimizing the risk of additional injuries to individuals behind the glass.	SG1-SG2 Designed for shotgun use, such as against hunting and shotgun ammunition.
BR4	Withstands bullets fired from a 9mm pistol.		
BR6	Designed to withstand heavier firearms, such as assault rifle ammunition.		

APPLICATIONS



Buildings

Embassies, banks, courtrooms, and other high-risk public spaces.



Vehicles

Military vehicles, VIP transport vehicles, and armored service vehicles.



Infrastructure

Critical areas in airports, train stations, and nuclear power plants



Military vessels

Military vessels where electrical heating can be integrated with bullet resistance.



Modular structures

Rapidly deployable solutions for crisis situations.



Defense industry buildings

High-security areas.



SIGNAL PROTECTION GLASS

SIGNAL-PROTECTED GLASS – FOR AREAS REQUIRING SECURITY AND PRIVACY

COMBINING SECURITY AND COMFORT

Our signal-protected glass not only blocks signal transmission but also offers excellent optical clarity and can be integrated with other security features such as bulletproof and blast-resistant properties.

Choose signal-protected glass when privacy and security are non-negotiable.

Our signal-protected glass provides reliable protection against electromagnetic signals, effectively blocking the passage of radio frequencies (RF), WLAN networks, 5G signals, and other wireless communications. This feature is specifically designed for critical areas where security and privacy are paramount.

TECHNOLOGY AND PERFORMANCE

Signal protection is achieved through the addition of special metal layers or films to the glass, which:

- Effectively attenuate signals across a wide frequency range
- Protect spaces from electronic surveillance and data leaks
- Enhance data security by preventing unauthorized devices from accessing wireless networks

Our signal-protected glass is tested in laboratory conditions, where attenuation values (dB) are measured across different frequency ranges. This ensures the high performance and reliability of the glass in all conditions.

APPLICATIONS

Signal-protected glass is ideal for locations where exceptional levels of privacy and cybersecurity are required:



Buildings and bunkers for military use

Improves safety and privacy by protecting critical communication channels



Defense industry and military vehicles

Blocks external signals, safeguards critical communication networks, and prevents interference or eavesdropping.



Mission and administrative buildings

Prevents the electromagnetic transmission of signals both in and out.



Security facilities and meeting rooms

Facilitates secure communication, free from external interference.



Telecommunication and data centers

Protect sensitive data and network connections.



X-ray facilities

Protects users from the harmful effects of X-rays.



EXPLOSION PRESSURE-RESISTANT GLASS

EXPLOSION-RESISTANT SECURITY GLAZING IN ACCORDANCE WITH ISO 16933: GLASS IN BUILDINGS – EXPLOSION-RESISTANT SECURITY GLAZING.

This standard outlines the test methods and performance criteria for explosion-resistant glass used in construction.

COMBINING SECURITY AND COMFORT

Our explosion-resistant glass provides excellent protection without compromising visibility. It can be integrated with other security features such as signal protection and bullet resistance, creating a complete solution for extreme conditions.

EXPLOSION-RESISTANT GLASS – MAXIMUM PROTECTION IN EXTREME CONDITIONS

Our explosion-resistant glass is designed to withstand the pressure waves, shrapnel, and impacts caused by explosions, such as those from bomb blasts or other explosive events. It offers high-level protection, preventing glass breakage and safeguarding users from serious injuries.

APPLICATIONS

Explosion-resistant glass is particularly useful in areas where the threat of explosions is high, and protection is a top priority.



Defense industry and military vehicles

Protection of military vehicles and field buildings from explosions and shrapnel.



Emergencies and crisis situations

Critical facilities such as bunkers and secure areas where protection from explosions is essential.



Public buildings and infrastructure

Airports, train stations, banks, and other high-risk areas where minimizing the threat of explosions is crucial.



Military sites and strategic areas

Enhance safety and mitigate the effects of dangerous pressure waves.

EN 13541

defines the requirements and testing methods for glass designed to protect buildings and their occupants from explosions. Available in ER1s-ER4s and ER1ns-ER2ns classifications.

TECHNOLOGY AND PERFORMANCE

Our explosion-resistant glass utilizes specialized glass and polymer layers that:

- Withstand explosion impacts and pressure waves without breaking or shattering into hazardous fragments
- Reinforce the structural integrity of the glass and protect individuals in the surrounding area from shrapnel and flying debris
- Provide protection against the effects of the pressure wave caused by an explosion, preventing damage to internal building structures and directing the pressure in a controlled manner

The performance of the glass is measured through explosion simulations, where the glass is exposed to a controlled explosion, and its resilience to pressure waves and shrapnel is evaluated. The test results provide precise pressure and distance values, which determine the glass's safety level.

	PERFORMANCE							
	Thickness mm	Weight kg	Optical transmittance	AVCP	Ballistic protection	Burglar resistance	Impact resistance	Max. size m
Stanag vol 2*	62	155	NPD	1	7,62*39 API BZ steelcore			1,8m^2
Stanag vol 3*	62	155	NPD	1	7,62*51 AP (WC-CORE)			1,8m^2
Stanag vol 3+*	59	148	NPD	1	7,62*51 AP (WC-CORE)			1,8m^2
BR 7 S	59,5	148	NPD	1	7.62*51 /HC1			2,4m^2
BR 6 NS	42	91,2	NPD/OW	1	7.62*51 non splintered			1,0 * 1,5 or 0,5x2,0
BR 4 NS	23	46,0	NPD/OW	1	44mag. non splintered			1,0 * 1,5 or 0,5x2,0
BR 6 S	41	90,0	NPD/OW		7.62*51			1,5*3,5
BR 4 S	22	45,0	NPD/OW		44mag.			2,2*3,5
P6B	12	30,0	NPD/OW	1		P6B		2,5*3,5
P7B	20	50,0	NPD/OW	1		P7B		2,5*3,5
P8B	25	60,0	NPD/OW	1		P8B		2,5*3,5
P4A	9,5 / 13,5	23,0	88	1			P4A	2,5*4,5
P5A	11	27,5	NPD	1			P5A	2,5*3,7
ansi 97.1	9	21,0	88	3			pendol. 45,4kg	2,5*4,5
er1 s	10	22,0	89				P5A	
er2 s	19	43,0	86			P6B		
er3 s	30	67,0	83			P6B		
er4 s	35	81,0	81			P8B		
Signal shield +55	18,5	33,0	NPD	3	500MHz-50GHz			1,5*3,5
Signal shield +35	min 10-	25,00	NPD	3	500MHz-50GHz			1,5*3,5
Signal shield +35 sticker	min 5	12,5	NPD	3	500MHz-50GHz			1,25*3,5
Signal shield +25 sticker	min 5	12,5	NPD	3	500MHz-50GHz			1,25*3,5
Signal shield +20	min 6	15,00	NPD	3	500MHz-50GHz			1,5*3

Bullet- and burglar-resistant glass available with electric heating.

*STANAG Levels 2 and 3 have been successfully tested on the shooting range; official certification is still in progress.



Tambest Oy is a leading high-precision glass manufacturer, established in 1984. Our state-of-the-art production equipment, combined with continuous product and process development, ensures the highest quality glass products for even the most demanding applications. Our goal is to shape the future of the glass industry through ongoing innovation and a commitment to environmental responsibility at every stage of our production process.



LEARN MORE
ON OUR WEBSITE



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