

Safety and Security Glass

 **ŞİŞECAM**
LAMINATED GLASS

 **ŞİŞECAM**
ULTRA CLEAR
LAMINATED GLASS



This is what you have



This is what you deserve



 **ŞİŞECAM**
LAMINATED GLASS

 **ŞİŞECAM**
ULTRA CLEAR
LAMINATED GLASS

Safety and Security Glass

Solution is in
Şişecam
Laminated Glass
Series

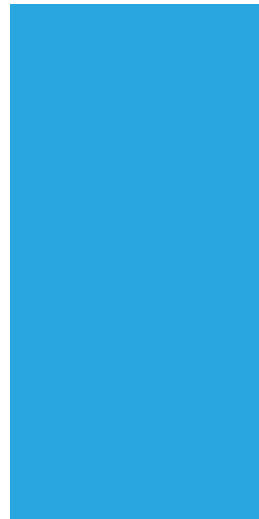


 **ŞİŞECAM**
ACOUSTIC
LAMINATED GLASS

Noise Control Glass

Noise Control Glass

 **ŞİŞECAM**
ACOUSTIC
LAMINATED GLASS





ŞİŞECAM
LAMINATED GLASS



ŞİŞECAM
ULTRA CLEAR
LAMINATED GLASS

Safety and Security Glass

Meets all safety levels



Şişecam Laminated Glass is the trademark of laminated glass of Şişecam Flat Glass. It is produced by combining two or more panels of glass with special binding agency polyvinyl butyral (PVB) interlayer under heat and pressure. If the glass is broken, most of the fragments remain stuck to the interlayer, therefore minimizing the risks of injury caused by broken glass.

Şişecam Ultra Clear Laminated Glass is the trademark of low iron laminated glass produced with low iron flat glass. The transparency of **Şişecam Ultra Clear Laminated Glass** is significantly higher, minimising distortion of the original colours of the objects behind it.



Multiple Functions

Safety: Minimizes risks of injury due to accidental impact.

Security: Retains its overall integrity and continues to act as a barrier even if the glass breaks, protection from vandalism, burglary attack. Able to with stand repeated blows from heavy objects such as bricks, hammers or crowbars.

Ultraviolet (UV) Control: Provide extremely high levels of protection against UV radiation (over 99 % of UV radiation is blocked), therefore helps to reduce fading and ageing effects.

Sound Insulation: Reduces noise, providing a quite atmosphere day and night.

Thermal Insulation: Low-e coated laminated glass products reduce heat loss coefficient, keeping more heat inside the building.

Solar Control and Thermal Insulation: Helps saving energy by reducing cooling and heating expenses of the building.

Decoration: Ideal for decorative or architectural applications. In addition to various options of color, Şişecam Ultra Clear Laminated Glass offers options for architects and interior architects with its transparent appearance.

Privacy: Şişecam Laminated Glass Opaque allows your privacy and security without compromising light transmission.

Applications

Regulations for safety glass applications; can be found at TS 13433 - Glazing in buildings - Code of practice for safety related to human impact.

Laminated glass is used in many applications such as,

- curtain walling,
- windows,
- overhead glazing,
- internal partitions,
- balustrades,
- doors,
- interior fittings,
- shower and bath enclosures,
- areas of high pedestrian traffic, museums & art galleries where UV protection is necessary,
- areas where improved acoustic performance is a requirement.
- passageways with busy pedestrian traffic



Gray

Bronze

Green




Blue

Turquoise

Safety and Security Level Determined

Glass Solutions for The Safety and Security Needs

You can find the following table regarding the safety and security level of glass solutions for your needs.

SOLUTIONS		CLASS OF RESISTANCE		
		Ball Drop Test EN 356	Pendulum Test EN 12600	Glass Configuration
LIFE SAFETY	 <p>Two panes of glass and a PVB interlayer with a minimum thickness of 0,38 mm</p>	-	2(B)2	3+0,38+3
				4+0,38+4
	 <p>Two panes of glass and a PVB interlayer with a minimum thickness of 0,76 mm</p>	P1A	1(B)1	3+0,76+3
				4+0,76+4
PROPERTY SECURITY	 <p>Two panes of glass and a PVB interlayer with a minimum thickness of 0,76 mm</p>	P1A	1(B)1	3+0,76+3
		P2A		4+0,76+4
		P2A		5+0,38+5

Şişecam Laminated Glass has C mark, it is manufactured in accordance with the results of the tests conducted at the international accredited laboratories to determine the class of resistance within the frame of TS EN 12600 and TS EN 356 standards, as a requirement of the relevant marking system.



ŞİŞECAM
ACOUSTIC
LAMINATED GLASS

Noise Control Glass

Do not let the noise come in.



Şişecam Acoustic Laminated Glass is trademark of sound insulation glass of Şişecam Flat Glass. Acoustic laminated glass contains a special acoustic interlayer which acts as a dampening core between the glass panes, preventing sound frequencies vibrating from one pane of glass to the other, developed for excellent sound insulation for places where there is excessive high level noise. **Şişecam Acoustic Laminated Glass** not only provides improved acoustic performance, it also provides the safety properties of **Şişecam Laminated Glass**. For efficient sound insulation, similar measures should be taken also in the other structural elements and materials such as walls, roof and joineries. **Şişecam Acoustic Laminated Glass** can be combined with many other high performance products from Şişecam Flat Glass range providing greater flexibility and helping you realize your glazing requirements.









Stop Noise Pollution

The increase in the level of urbanization causes sound and noise pollution. The noise pollution caused by the cars, traffic and airplane departures have significant effects on the human physiology and psychology. From a physiological aspect, such effects can be listed as hearing loss, hypertension, cardiac diseases etc; and from a psychological aspect, they can be listed as stress, insomnia, anxiety, and poor concentration. With the **Şişecam Acoustic Laminated Glass** the outdoor noise level can be lowered down to the level of a quiet atmosphere, and thus the quality of life is improved for the individuals.

Applications

- Ideal choice of glass in situations where there is excess noise from road, rail or air traffic, or various other sources for example factories or nightclubs.
- Interpreting booths
- Office separations
- Meeting rooms
- Concert areas

Enjoy the Silence

dB	EXAMPLES	EVALUATION	GLASS CONFIGURATION	SOUND INSULATION VALUES		
				Rw	C	Ctr
140	 Jet aircraft, short distance away	DETRIMENTAL	8+0,76A+8	44	0	-2
130	Rock music concert					
105	Pneumatic drill					
90	 Urban road traffic	VERY HIGH	(4+0,76A+4)+16+6	41	-2	-6
82	Loud factory hall					
80	 Loud radio music	HIGH	(4+0,76A+4)+16+8	42	-3	-7
	Noises in schools, without acoustic insulation					
62	 Railway traffic at high speed	MEDIUM	(4+0,76A+4)+20+10	45	-1	-5
50	Office noise					
40	 Low level music in the house	Low	(5+0,76A+5)+16+6	42	-1	-5
20	Whispering					
0	 Threshold of Hearing	Very low	(4+0,76A+4)+12+6+12+10	45	-1	-4

There is nearly 3dB difference between Şişecam Laminated Glass and Şişecam Acoustic Laminated Glass, and 5 dB between Şişecam Clear Float Glass and Şişecam Acoustic Laminated Glass. In sound insulation, 10dB means a decrease of 50% in noise

Correction Factors (C, Ctr)

Correction Factors

The measuring unit for the sound insulation behaviour of a building component is R_w . This value is merely an average simplifying mutual comparison of various building components. The ears sensitivity to sound volumes in relation to their frequency pitch can only be taken into account with the airborne sound insulation index R_w . Here the spectrum adjustment factors C and Ctr adjust the average. For sound waves featuring high frequencies, the factor C needs to be added to the R_w value. For lower frequencies, factor Ctr needs to be added. The acoustic behaviour of a building component is hence defined in R_w (C, Ctr). A building component with the values R_w (C, Ctr) = 40 (-1, -5) provides an average insulation performance of 40dB. For higher pitched sounds the sound insulation is lessened by 1dB and for lower pitched sound sources it is lessened by 5 dB.

HOW TO REDUCE NOISE

Greater the thickness provides better noise reduction for low frequencies.

The incorporation of glass of different thickness into the double glazing will provide a benefit.

Laminated glass should be used singly or in combinations of double glasses

Acoustic laminated glass should be used singly or in combinations of double glasses

Medium and High Frequency Noise	Low Frequency Noise
R_w+C	R_w+C_{tr}
Normal frequency noise levels such as talking, listening to music, radio and TV	Inner city street noise
Children playing	Disco music
Railway traffic at medium and high speed	Railway traffic at low speed
Highway traffic travelling at over 80 km/h	Propjet planes
Airplanes using jet propulsion from a short distance	Airplanes using jet propulsion from a great distance
Production plants, which emit predominantly medium to high frequency noise	Production plants which emit predominantly low frequency noise

