A sound solution

advanced acoustic glazing technology

Saflex

High performance interlayers for laminated glass

Peace
Quiet
Well-being
Silence
Architecture
Relaxation
Design
Harmony
Comfort
Room atmosphere
Focus
Concentration
Serenity
Productivity

Designing for sound reduction

Modern building designs emphasize liberal use of glass. Meanwhile, building owners and occupants demand comfort—including reduced ambient noise. However, sound transmission is greatest through glazing made with ordinary window glass. This is especially a challenge for designers and engineers developing urban projects along highways, railroads, and airports. The answer is not less glass but new glazing materials, such as Saflex® Acoustic interlayers with proven sound-dampening performance.

Exterior applications

Isolating interior building spaces from exterior sound is critical. Nearly all buildings have areas that could be adversely affected by high levels of sound transmitted from outside. Many constructions, such as airports, hotels, and high-rises, as well as those in densely populated commercial and residential areas, mandate sound reduction as a key design goal. Saflex is the ideal choice in these and other applications.

- Offices and retail centers
- Schools, hospitals, and government buildings
- Theaters, museums, and other entertainment venues
- Airports and surrounding structures
- Hotels and condominiums
- Neighborhoods

Interior applications

With the growing trend of open architectural environments and increased use of glass for interior walls, unwanted sound is on the rise. Unfortunately, ordinary glass is a poor acoustic barrier. Interior sound pollution can make it more difficult to concentrate, to speak on the phone, or to keep information private and confidential. Many application opportunities exist where Saflex can provide increased interior security, privacy, and comfort.

- Business offices, boardrooms, meeting rooms, and cubicles
- Hotel and restaurant spaces
- Medical care centers and health clinics
- School classrooms and lecture halls
- Recording studios and broadcast facilities
- Concert halls, theaters, auditoriums, and museums
- Legal, investment, and accounting private practices
- Home offices and theaters

Saflex® Acoustic

Reduces perceived loudness by up to 50%

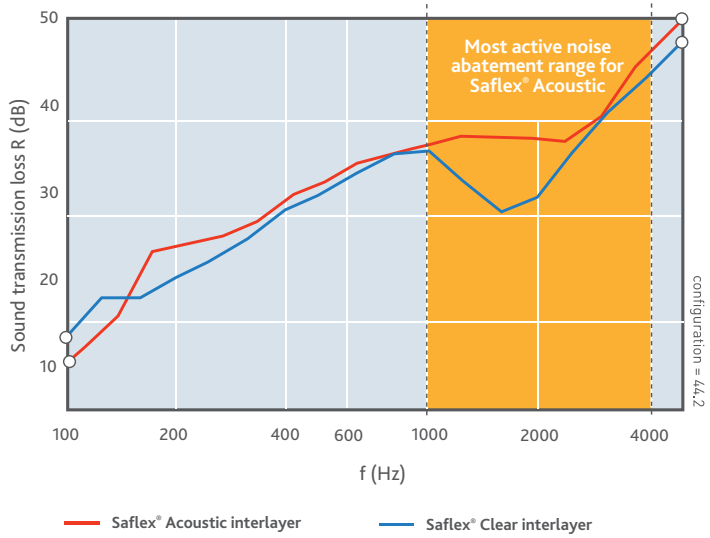
While laminated glass with standard PVB interlayers provides noise reduction capabilities compared to ordinary glass, the new Saflex® Acoustic PVB is a superior solution for architects specifying glazing systems requiring even higher levels of acoustic comfort.

Saflex Acoustic is an advanced, three-layer system designed to decouple and disseminate sound waves for superior sound dampening performance. This patented system targets sounds in the 1,000–3,000 Hz range, which is the most sensitive range of human hearing.

A recent study by the Institute of Neuroscience at Newcastle University shows that sounds in the higher-frequency range of 2,000–5,000 Hz were rated as most unpleasant. Typical urban sounds in this range include aircraft, motor vehicles, emergency sirens, chainsaws, weed trimmers, alarms, jackhammers, power tools, and construction sites among others.

Utilizing Saflex Acoustic PVB on window and door systems results in a reduction of up to 10 decibels in the "transparent" frequency, which equates to a 50% reduction in perceived loudness!

Sound transmission loss*



*Sound transmission loss of laminated glass with Saflex® Acoustic interlayer and Saflex® Clear interlayer. Configuration = 44.2

The ability to reduce noise as perceived by the human ear can be measured. This measurement involves sending specific frequencies of sound through a material, in this case, laminated glass with Saflex® Acoustic interlayer, and remeasuring what comes "through" the glass to determine what gets "filtered" out. The transmission loss is recorded and can be illustrated in graphical form as shown in the figure.

Note

All documents presented in this section are based on samples prepared in Eastman laboratories. Testing certifications from third-party laboratories had a limited number of samples evaluated and are valid for materials tested and not guaranteed for all samples. Samples evaluated at Eastman are tested in accordance with noted standards and procedures. Laboratories are responsible for securing their own performance certificates based on the lamination process.

Acoustic data for select configurations

	Rw/STC	C	Ctr	OITC	DR*
Laminated glass with Saflex® Acoustic in single-unit configuration					
3,3.Q	36	–1	–3	31	140
4,4.Q	37	–1	–3	31	153
5,5.Q	38	–1	–3	31	183
6,6.Q	39	–1	–2	33	210
8,8.Q	41	–1	–3	30	309
10,10.Q	43	–1	–3	34	292
12,12.Q	44	–1	–3	32	396
Laminated glass with Saflex® Acoustic in insulating units					
3[12]3,3.Q	38	–1	–5	31	224
3[12]4,4.Q	38	–1	–5	31	200
6[12]3,3.Q	41	–2	–5	33	239
6[12]4,4.Q	41	–1	–5	34	249
6[12]5,5.Q	42	–2	–5	34	253
8[12]3,3.Q	42	–1	–4	35	290
8[12]4,4.Q	44	–1	–4	36	306
Double laminated glass with Saflex® Acoustic in insulating units					
3,3.Q[12]3,3.Q	43	–2	–6	34	283
6,6.Q[12]8,8.Q	49	–1	–5	40	380
6,6.Q[20]4,4.Q	50	–3	–8	36	406
8,6.Q[20Ar90]5,5.Q	51	–2	–7	42	432
Laminated glass with Saflex® Acoustic in triple-insulating units					
6[12Kr90]4[12Kr90]4,4.Q	43	–2	–8	32	344
3,3.Q[12]3,3.2[12]3,3.Q	44	–2	–6	34	300
3,3.Q[12]3[12]3,3.Q	44	–1	–5	35	293
8[12Kr90]4[12Kr90]4,4.Q	44	–2	–7	33	354
6,6.4QR[12]6[12]3,3.2Q	47	–2	–6	36	320
4,4.Q[12Kr90]6[12Kr90]5,5.Q	48	–3	–8	37	437

*Data valid for unit as tested, +/– 1 unit for all thicknesses of Saflex Acoustic interlayer. Single-unit laminated glass values are averages of multiple tests on the same configuration. Data tested in accordance with ASTM E90 or ISO 10140 and calculated with ASTM E413, E1332, and ISO 717-7. All samples are glass-only tests at ambient temperature.

All thicknesses of properly laminated Saflex Acoustic interlayer are capable of passing safety-glazing requirements such as ANSI Z97.1 and EN 12600 impact requirements and are deemed as acoustic interlayers per ISO 16940 MIM testing.

Saflex® Acoustic product selector*

	Thickness	Applications	Target end-use applications
Saflex QS31	0.64 mm (0.025 in.)	Acoustic and glass shard retention	Residential windows and sliding doors, office partitions
Saflex QS41	0.76 mm (0.030 in.)	Acoustic and safety impact performance	Curtain walls, storefronts, large fixed panel windows
Saflex QS71	1.52 mm (0.060 in.)	Acoustic, high-impact, and complex configuration. [ASTM F1233 and E2395, EN 356, UL 972]	Large commercial glass panels, complex configurations, high-impact glazing for burglary resistance

**Consult your regional Saflex sales representative for availability of widths in each region.*

Additional benefits of laminated glass

In addition to proven acoustic performance, Saflex interlayers help window systems achieve the following benefits:

Safety: Protecting building occupants and pedestrians from accidental glass impact, breakage, or fallout

Security: Providing burglary and forced-entry resistance, ballistic (bullet) protection, and bomb-blast resistance

Storm: Providing storm-resistant technology to laminated glazing systems

Solar: Filtering more than 99% of UV rays, controlling visible light radiation, and reducing heat buildup and thermal stress

VANCEVA Architects and designers are also discovering the beauty that laminated glass provides with endless color options for glazing. Visit the Vanceva color studio at www.Vanceva.com to discover the custom color system, whites collection, specialty colors, and colors that match standard-colored glass.

Eastman is a specialty chemical company focused on innovation and performance.

Our involvement in building and construction is widespread—and spreading. We supply advanced, high quality PVB interlayers that enhance glass in terms of safety, security, strength, solar/UV control, style, and sound control.

We are dedicated to the building and construction industry, especially in the development of innovative material solutions that solve the market's most challenging problems. Our products are designed to provide exceptional performance, quality, and durability.

For additional information regarding designing for acoustic performance using Saflex interlayers, including technical information specific to acoustic testing requirements, email us: **saflex@eastman.com.**

Architects and designers trust Saflex® and Vanceva®

Around the world, architects and designers trust Saflex and Vanceva when safety, performance, and comfort are their most critical concerns. The reason for their confidence is simple. No matter what the specifications or performance targets, Saflex interlayer technology delivers advanced glazing performance for demanding applications.

EASTMAN
The results of **insight**™

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