TECHNICAL GUIDE

Acoustic Glazing Rw

Explained and simplified

Sound behaves nothing like fire, blast or ballistics. It does not need to break anything to get through — it only needs a gap.

Everything about acoustic glazing comes down to two things: **how many decibels** you need to lose, and **whether the weakest part of the assembly can deliver it**. In practice the second one decides most projects.

1 · The decibel, and why the numbers feel wrong

The decibel is logarithmic, not linear. That is why acoustic figures never behave the way people expect.

Change	What it means physically	What people actually hear
3 dB	Half the sound energy	Only just noticeable
6 dB	A quarter of the energy	Clearly noticeable
10 dB	One tenth of the energy	About half as loud
20 dB	One hundredth of the energy	About a quarter as loud

This is why moving a specification from 40 dB to 45 dB sounds like a small step and is not. It is also why the last few decibels are always the most expensive ones on the project.

2 · STC, Rw and OITC — three ratings, one idea

All three are single-number ratings derived from the same kind of laboratory test: sound is generated on one side of the specimen, measured on the other, and the loss is recorded across a range of frequencies. They differ in which frequencies they weight.

STC
AMERICAN

Sound Transmission Class

Calculated to ASTM E413 from laboratory data measured to ASTM E90, over 125–4000 Hz. Weighted towards speech. Recommended for **interior** partitions and doors.

Rw
EUROPEAN

Weighted sound reduction index

Calculated to EN ISO 717-1 from laboratory data measured to EN ISO 10140. The standard rating throughout Europe and widely used in the GCC.

OITC
AMERICAN

Outdoor-Indoor Transmission Class

Calculated to ASTM E1332 over 80–4000 Hz, weighted towards low-frequency traffic and aircraft noise. Recommended for **exterior** facades.

3 · C and C_{tr} — the numbers in brackets

European glass data is usually quoted as, for example, **R_w 41 (–1; –5)**. Those two figures in brackets are the spectrum adaptation terms, and they matter more than the headline number on a noisy site.

Term	Add it when the noise is…	In the example above
C	Higher frequency — speech, television, activity inside the building, light traffic at speed	R_w + C = 40 dB
C_{tr}	Lower frequency — urban road traffic, rail, distant aircraft, mechanical plant	R_w + C_{tr} = 36 dB

THE NUMBER TO LOOK AT ON A ROAD-FACING FACADE

A glazing unit quoted at R_w 41 may deliver only 36 dB against a busy highway. Where the dominant noise is traffic or aircraft — which in the Gulf it usually is — **R_w + C_{tr} is the honest figure**, not R_w.

R_w and STC are close for most glazing — typically within a point or two — but they are calculated differently and are **not interchangeable**. Where a specification cites one and the test data reports the other, that has to be reconciled deliberately, not assumed.

4 · What actually makes glazing quiet

- **Mass.** Heavier stops more. Doubling the mass of a single pane buys roughly 5 to 6 dB — useful, but expensive and quickly limited by weight.
- **Asymmetry.** Two panes of *different* thickness outperform two of the same thickness, because each has a different coincidence frequency and one covers the other's weak point. Symmetrical double glazing has a dip that a specification will find.
- **Acoustic interlayer.** A damping PVB interlayer in a laminate absorbs vibration and lifts performance well beyond what the added mass alone would give.
- **Cavity width.** A wide airspace beats a narrow one. This is why a 100 mm double-glazed partition with two independent laminated panes outperforms a sealed insulating unit of the same total glass thickness — and it is the single biggest lever available.
- **Decoupling.** Anything that mechanically links the two panes carries sound across the cavity. Independent glazing lines in a wide frame perform better than a rigidly bonded unit.

5 · The weakest link decides everything

This is the point that matters more than any other, and the one that causes most acoustic disputes at handover.

> **THE RULE**
>
> An R_w 50 partition with an R_w 35 door in it is not an R_w 50 partition. A small area of poor performance dominates the result, and an unsealed gap dominates it completely.

- **The door governs.** On a glazed partition, the door is almost always the limiting element. Acoustic performance depends on perimeter seals, an automatic drop seal at the threshold, correct closing pressure and hardware that maintains it over time.
- **Flanking transmission.** Sound travels over the head, under the floor, through the raised floor void, through the ceiling plenum and along the mullion — not only through the glass. A partition is only as good as its junctions.
- **Site is not the laboratory.** Laboratory R_w is measured on a perfect specimen in a controlled rig. On site the corresponding measurement is $D_{nT,w}$, and it is normally several decibels lower. A specification that quotes a laboratory number as a site acceptance criterion is setting up an argument.
- **Services penetrations.** Switch boxes, grilles and cable routes through an acoustic partition undo it unless deliberately detailed.

6 · Our acoustic partition systems

We manufacture two double-glazed acoustic partition systems, developed with our European system partners Aluprof and Fitechnic. Both take two independent glazing lines in a single frame, which is what allows the cavity to do the work.

	BA 80 acoustic partition	BA 100 acoustic partition
Frame depth	80 mm	100 mm
Configuration	Twin independent glazing lines with a separated cavity	Twin independent glazing lines with a wider separated cavity
Typical glazing	Asymmetric laminated panes with acoustic PVB interlayer	Asymmetric laminated panes with acoustic PVB interlayer, increased thickness
Suited to	Offices, meeting rooms, executive suites and general commercial partitioning	Boardrooms, control rooms, confidential and secure areas, and the highest acoustic targets
Doors	Matching single and double leaf acoustic doorsets with perimeter and drop seals	Matching single and double leaf acoustic doorsets with perimeter and drop seals

Achievable performance depends on the glass make-up, the cavity, the doorset and the junction detailing. We confirm the rating against test data for the specific configuration proposed rather than quoting a system-wide headline figure.

7 · What the numbers mean in a real building

Target	What it typically delivers	Where it is usually specified
R_w / STC 35–40	Normal speech is audible but not intelligible through the partition	General office partitioning, corridors
R_w / STC 42–47	Raised speech reduced to an indistinct murmur; the common hotel guest-room facade target across the Gulf	Meeting rooms, hotel rooms, classrooms, urban facades
R_w / STC 50–55	Speech privacy in the proper sense — raised voices not intelligible	Boardrooms, HR and legal offices, medical consulting, confidential areas
R_w / STC 55+	Approaching the practical limit for a glazed assembly; every junction must be engineered	Control rooms, secure briefing rooms, studios, plant-adjacent spaces

Indicative guidance only. The target for any given space is set by the project's acoustic consultant against the actual noise environment and the intended use.

8 · The four things that go wrong most often

	The mistake	Why it matters
1	A number with no rating system — “50 dB”	STC, R_w, R_w+C_{tr} and $D_{nT,w}$ are four different figures for the same wall
2	Specifying the partition and forgetting the door	The door governs the result. A high-performing partition with an ordinary doorset delivers the doorset's number
3	Quoting a laboratory figure as a site acceptance criterion	Field performance is normally several decibels below laboratory. This should be agreed in advance, not disputed at handover
4	Ignoring flanking paths and junctions	Sound over the head, under the floor and through the ceiling void bypasses the glass entirely

9 · Quick reference

If you…	Look at
Are specifying an internal partition or door	STC, or R_w
Are specifying an external facade	OITC, or $R_w + C_{tr}$
Face road, rail or aircraft noise	$R_w + C_{tr}$ — not R_w
Need genuine speech privacy	R_w / STC 50 and above, with a matched doorset
Will test the installation on site	Agree a $D_{nT,w}$ target, not a laboratory R_w

10 · The range at British Aluminium

We supply the complete range across both certification systems — EN and US — as certified assemblies, not assembled from separately rated parts.

Range	Products	Standards
Fire-rated doors	Hinged, pivoted, sliding and automatic sliding; solid and glazed	EN 13501-2 / EN 1634-1 · UL 10C / NFPA 252
Fire-rated windows and screens	Fixed and operable windows, glazed screens and partitions	EN 13501-2 / EN 1364-1 · UL 9 / NFPA 257 / ASTM E119
Fire-rated curtain wall	Stick-built and unitised, internal and external	EN 1364-3 · ASTM E119 / UL 263
Blast-resistant systems	Curtain wall, windows, aluminium and steel blast doors, bunker and hangar doors	EN 13123 / 13124 / 13541 · GSA-TS01 / ASTM F1642 / UFC
Ballistic-resistant systems	Aluminium and steel framed glazing, doors and public counters	EN 1522 / EN 1063 · UL 752 / NIJ 0108.01
Acoustic systems	80 mm and 100 mm double-glazed partitions, acoustic doors and screens	EN ISO 10140 / EN ISO 717-1 · ASTM E90 / E413 / E1332
Combined performance	Fire with blast, ballistic with acoustic, and other multi-requirement assemblies	Certified per configuration

The easiest way to start: tell us the target and whether it is STC or R_w, send the partition layout and door schedule, and confirm the ceiling and floor build-up at the junctions. We will confirm the glass make-up and doorset needed to reach it.

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Issued for information. Acoustic targets and the building's overall acoustic strategy are the responsibility of the project's acoustic consultant. This document does not constitute acoustic engineering advice. Performance figures are indicative; the rating for any assembly is established by test data for that specific configuration. Standards are cited as at the date shown and this guide is revised without notice; always work from the current issue.