AWS
ARCHITECTURAL WINDOW SYSTEMS

ACOUSTICS TESTED WINDOWS & DOORS

ACOUSTICS
TESTED - CERTIFIED

/ AWS SOUND INSULATING WINDOW SYSTEMS

AWS HAS WINDOW AND DOOR SOLUTIONS TO HELP YOU MANAGE AND MINIMISE THE IMPACT OF SOUND WITHIN YOUR PROJECTS

AWS is committed to offering window and door solutions that not only provide light and ventilation but help to create unique living spaces protected from harsh environmental elements.

Unwanted or harmful noise has increasingly become part of our urban environment causing annoyance and disturbance to our lifestyle.

Through considered innovation, AWS offers a range of windows and doors from the Elevate, Vantage and ThermalHEART brands to assist in insulating the building envelope from unwanted noise - making it easier to create beautiful living spaces which meet contemporary aspirations for efficiency and comfort.

These systems are tested by the National Acoustic Laboratories to provide the highest level of assurance in their performance integrity.

/ Scotts School, Albury. NBRS+P Architects. Windows by DLG Aluminium & Glazing.

ACOUSTICS TESTED WINDOWS & DOORS

BACKGROUND

Our expectation for comfort and efficiency in our built environment is changing. Urban in-fill development, busier transportation routes and changes in the ways we use our homes are increasing our focus on achieving “acoustic comfort”.

In recent years the problem of unwanted or harmful noise has become a pressing issue throughout Australia. Local governments have introduced regulations to address the problem, in some instances local municipalities have their own regulations or guidelines regarding noise abatement. It is likely that over the next few years regulations to address intrusive external noise will strengthen.

The correct selection of window and door systems can have a significant effect on the internal acoustic comfort of a building.

SOUND LEVELS

Sound levels are expressed in decibels (dB). The higher the dB rating, the stronger the sound source – this is a measure of the Sound Pressure Level (SPL). SPL is a measure of the power of the sound source.Generally, we refer to this as “loudness”. Technically speaking, “loudness” is really a combination of the SPL and the duration of the sound.

The higher the dB rating, the stronger the sound. For example, the sound of a whistling bird (50dB) is stronger than the sound of a falling leaf (10dB).

Sound can occur as a single frequency (e.g. a single musical note) or can be made up of various frequencies (e.g. traffic noise).

A frequency is expressed in hertz (Hz). Generally when we refer to “high” or “low” pitched sound we are talking about sound frequency. Frequencies can be broken in to three categories, low tones, mid tones and high tones, The frequency range of urban road traffic is concentrated around the low tones whereas a whistling tea kettle consists of high tones.

The loudness (dB) and pitch (Hz) of a sound taken together determine their impact on our acoustic comfort and how to manage it.

100dB

EQUATES TO

NEARBY AIRCRAFT TAKING OFF

JACKHAMMER 2M AWAY

NEARBY HEAVY TRAFFIC/HORNS

ACOUSTICS TESTED WINDOWS & DOORS

SOUND LEVELS

WORLD HEALTH ORGANIZATION (WHO) COMMUNITY NOISE GUIDELINES

The Guidelines for Community Noise developed by the WHO seek to consolidate scientific knowledge on the health impacts of community noise. The report provides guidelines to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments and establish criteria to protect the majority of the population from ill effects based on the research findings. These ill effects might typically be reducing the quality of sleep – which can have long term impacts on our general physiological health and well being.

MEASURING THE ACOUSTIC PERFORMANCE OF A WINDOW

Sound or acoustic performance of a window is measured by the weighted sound reduction index or Rw value. Rw values are determined by measuring the reduction in dB achieved where a window is used to insulate against a sound source.

The Rw value will increase as the acoustic performance of a window improves, so that a window with an Rw value of 41 has a significantly improved acoustic performance over a window with an Rw value of 30. Every improvement in Rw value equates to a reduction in decibels of 1.

80dB - Rw41= 39dB

EXTERNAL NOISE GLAZING UNIT INTERNAL SOUND

RW CORRECTION VALUES

Rw values represent aggregated data showing the average performance of a window across a broad spectrum of sounds.

One of the limitations of using this as measure of performance is that the response of the human ear to differentials in sound level is logarithmic, not linear.

What this means is that we are very sensitive to small changes in sound level, up or down, and that we perceive this change as being much greater or smaller depending on how loud the sound was in the first place.

Normal, casual conversation happens around the 60dB mark. We are most sensitive to changes around the mid frequency levels – 70dB (a dog barking) to 100dB (a lawnmower). Note that the sound levels we find annoying represent relatively small increases in the sound level (10dB to 40dB) but we would perceive these changes as more than doubling the impact of conversation level noise in the room in the first place.

To provide a more accurate description of a window's performance when subjected to different types of sound, we use correction values – these values are shown in brackets beside the Rw value, for example, Rw41 (-1.1). These values are designed to balance the complex considerations of "loudness" (dB), "pitch" (Hz) and the intended use of the room.

The first value is the "C" value which represents mid and high tone noises (e.g. people talking). The second "C" value represents sound dominated by low and mid tones (e.g. road traffic noise). By applying these values to the defined Rw value you achieve a more reliable interpretation of a window's performance when subjected to specific noise sources.

If required, AWS can supply more specific information on the performance of our tested systems.

TYPE OF NOISE SOURCE	ADAPTATION TERM
Living activities (talking, music, radio, tv) Children playing Railway traffic at medium and high speed Highway road traffic >80km/h Jet aircraft, short distance Factories emitting mainly medium and high frequency noise	C
Urban road traffic Railway traffic at low speeds Aircraft, propeller driven Jet aircraft, large distance Amplified music Factories emitting mainly low and medium frequency noise	Ctr

ACOUSTICS TESTED WINDOWS & DOORS

WINDOW SELECTION CONSIDERATIONS

Correct specification and installation of windows for a project will help to ensure a building envelope achieves desired outcomes for reduction of unwanted sound. Sounds such as traffic or airport noise are major contributors to sound nuisance and can cause a range of physical and psychological concerns of residents. The ability for a window or door to provide good sound reduction is dependent upon a number of factors:

- Glass selection
- Quality of gaskets and seals
- Window style
- Correct installation

GLASS SELECTION

SINGLE GLAZING

As a general rule, where single glazing is used, the acoustic performance of the glass improves as the thickness increases.

LAMINATED GLASS

Laminated glass will typically deliver better sound reduction properties than float or toughened glass. Laminated glass is made up of two panes of glass pressed together with a polyvinyl butyral inter layer. This layer is typically only .38mm in thickness but helps to absorb some vibrations, therefore performing better for sound reduction.

Special products have been designed to further improve the performance of laminated glass for sound reduction. Viridian VLam Hush™ uses a unique inter layer which is designed to dampen sound transmission over critical frequencies. This means that thinner and lighter glass can be used for equivalent acoustic performance of a thicker and heavier glass panel.

DOUBLE GLAZING

Whilst double glazed door and window systems perform well in terms of sound reduction, double glazing may not necessarily deliver better acoustic performance than single glazing – particularly when compared with specially laminated glass.

Double glazing will perform better acoustically when the thickness of the two panes is increased and one of the panes is different in thickness to the other, known as asymmetric double glazing.

ASYMMETRIC GLAZING

This involves placing two panes of differing thickness into one sealed unit e.g. a 6mm outer pane and a 4mm inner pane. This leads to a perceptible difference in performance compared to normal double glazing with two panes of the same thickness.

INSTALLATION

Regardless of how a window is specified or constructed, if it is poorly installed it will not deliver its maximum sound reduction properties. Vantage, Elevate™ and ThermalHEART™ windows and doors must always be installed by a licensed builder or installer in accordance with correct installation guidelines.

WINDOW STYLE

The design, or format of a window or door will impact on its ability to deliver sound insulation.

By design, some windows and door styles "seal" better than others. For example, an awning window or casement window is designed so that the operable sash physically compresses the window seals when it closes, and as such will provide a much better performance than a sliding window which brushes past the sealing component (typically a mohair brush seal).

In the same way that water can leak into a poorly sealed structure, sound can leak or seep through a poorly sealed or poorly installed window.

Comparison of acoustic performance by window style

BEST ACOUSTIC PERFORMANCE	Awning Window	Casement Window
GOOD ACOUSTIC PERFORMANCE	Bi-fold Door	Hinged Door
BETTER ACOUSTIC PERFORMANCE	Sliding Window	Double-hung Window
	Sliding Door	

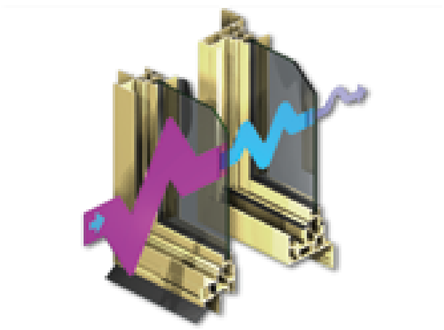
ACOUSTICS TESTED WINDOWS & DOORS

SOUNDOUT™ WINDOWS

The best acoustic performance for windows comes when an air gap between 20mm and 150mm can be produced. This air gap is much larger than can be produced using typical hermetically sealed double glazed units. Instead a secondary window is installed 100mm behind the usual window (also known as secondary glazing).

AWS offers a number of SoundOUT™ secondary glazing solutions including:

- Series 531 SoundOUT™ Sliding Window
- Series 532 SoundOUT™ Casement Window
- Series 533 SoundOUT™ Sliding Door
- SoundOUT™ products can be installed behind existing windows or doors to achieve increased sound insulation for the building envelope.
- SoundOUT™ secondary glazing system



SoundOUT™ secondary glazing system

ACOUSTIC TESTED SYSTEMS

AWS has tested the acoustic performance of a number of glass and frame combinations. All AWS windows and doors which have been acoustics tested are identified by the Acoustics Tested symbol illustrated on the right.

ACOUSTICS TESTED WINDOWS & DOORS

AWS PRODUCT SOLUTIONS

AWS has tested a number of systems for acoustic performance. The table below provides a summary of all tested systems.

Series	Description	Glass	Rw ($C;C_{tr}$)	Test Report
105	Office Partitioning System	6.38mm/40mm Air/6.38mm	40 (-3,-8)	15-083-01
105	Office Partitioning System	10.38mm/40mm Air/6.38mm	44 (-1,-6)	15-083-02
105	Office Partitioning System	10.38mm/40mm Air/10.38mm	45 (-1,-5)	15-083-04
105	Office Partitioning System	10.38mm	35 (-1,-2)	15-083-04
400	CentreGLAZE™	6.5 Vlam Hush™	34 (0;-3)	4867-5 REV A
400	CentreGLAZE™	10.5 Vlam Hush™	37 (0;-3)	4867-6 REV A
400	CentreGLAZE™	10.38 Lam	34 (-1;-2)	4867-7 REV A
400	CentreGLAZE™	6.38 Lam	32 (-2;-3)	4867-8 REV A
411	Top-Hung Bifold Door	6.38 Lam	28 (0;-2)	4867-22
411	Top-Hung Bifold Door	8.38 lam	31 (-1,-2)	4867-23
424	CentreGLAZE™	8.5 Vlam Hush™/10mm Air/6.5 Vlam Hush™	39 (-2;-6)	4867-1
424	CentreGLAZE™	6.5 Vlam Hush™/12mm Air/6mm Tgh	36 (-1;-5)	4867-2
442	Commercial D'Stacker	6.38 Lam	32 (-1,-2)	ALA-16-090-11
442	Commercial D'Stacker	10.5mm Vlam Hush™	36 (0,-2)	ALA-16-090-12
442	Commercial D'Stacker (Rail Stiffeners)	12.5mm Vlam Hush™	38 (-1,-3)	ALA-16-090-13
466	Commercial Awning Window	6.5mm Vlam Hush™/10mmAir/8.5 Vlam Hush™	41 (-1;-5)	4867-10
466	Commercial Awning Window	6mm Tgh/12mmAir/6.5 Vlam Hush™	40 (-1;-5)	4867-11
466	Commercial Awning Window	6.5mm Vlam Hush™	35 (-1;-4)	4867-9
471	Apartment Sliding Door	6.5 Vlam Hush™	32 (-1,-3)	4867-19
471	Apartment Sliding Door	10.5 Vlam Hush™	33 (0,-2)	4867-20
471	Apartment Sliding Door	6.5VLam Hush™ / 8Air / 5Toughened	33 (-1;-2)	4867-21
504	Sliding Window	3mm float	STC22	ATF283
504	Sliding Window	6.38mm Lam	32 (-1;-2)	ATF813
504	Sliding Window	7.52mm Lam	32 (-1;-2)	ATF814
504	Sliding Window	20mm IGU (6mm/8 Air/6.38 Lam)	30 (0, -1)	ALA 17-086-1
504	Sliding Window	6mm Glass	29 (0, -1)	ALA 17-086-2
504	Sliding Window	10mm Glass	31 (0, -1)	ALA 17-086-3
514	Double-Hung Window	7.52mm Lam	30 (-2;-3)	AFT785
514	Double-Hung Window	5mm float	28 (-2;-3)	ATF783
514	Double-Hung Window	6.38mm Lam	29 (-3;-4)	ATF784
514	Double-Hung Window	7.52mm Lam	30 (-2;-3)	ATF785
516	Awning Window	6.38mm Lam	34 (-1; -2)	ATF1195
516	Awning Window	3mm	STC30	ATF262
516	Awning Window	10.38mm Lam	STC36	ATF265
516	Awning Window	20mm IGU (6mm/8mm Air/6.38mm Lam)	33 (-1, -4)	ALA 17-086-4
516	Awning Window	6mm	30 (-1, -1)	ALA 17-086-5
516	Awning Window	10mm	33 (-1, -2)	ALA 17-086-6

ACOUSTICS TESTED WINDOWS & DOORS

AWS PRODUCT SOLUTIONS

Series	Description	Glass	Rw (C;C_{tr})	Test Report
531	SoundOUT™ Sliding Window with primary 504 Awning window (3mm float) and 100mm air gap	6.38mm Lam	STC38	ATF284
531	SoundOUT™ Sliding Window with primary 504 Sliding window (3mm float) and 100mm air gap	7.52mm Lam	41 (-2; -8)	ATF816
531	SoundOUT™ Sliding Window with primary 504 Sliding window (3mm float) and 100mm air gap	6.38mm Lam	41 (-2; -7)	ATF817
532	SoundOUT™ Casement with primary 516 Awning window (3mm float) and 100mm air gap	6.38mm Lam	STC45	ATF263
532	SoundOUT™ Casement with primary 516 Awning window (3mm float) and 100mm air gap	10.38mm Lam	STC50	ATF264
533	SoundOUT™ Sliding Door with primary 541 Sliding Door (4mm Tgh) and 100mm air gap	6.38mm Lam	42 (-1;-6)	ATF798
533	SoundOUT™ Sliding Door with primary 541 Sliding Door (4mm Tgh) and 100mm air gap	6.38mm Lam	42 (-1;-6)	ATF799
533	SoundOUT™ Sliding Door with primary 541 Sliding Door (4mm Tgh) and 100mm air gap	4mm Tgh	41 (-2;-7)	ATF800
533	SoundOUT™ Sliding Door	6.38mm Lam	30 (1;-1)	ATF801
533	SoundOUT™ Sliding Door	7.52mm Lam	31 (1;-1)	ATF802
541	Sliding Door	6.38mm Lam	30 (-3;-4)	ATF792
541	Sliding Door	6.38mm Lam	32 (-1;-2)	ATF793
541	Sliding Door	10.38mm Lam	35 (-2;-3)	ATF794
541	Sliding Door	7.52mm Lam	32 (0;-1)	ATF795
541	Sliding Door	5mm Tgh/9mm Air/5mm Tgh	33 (-1;-3)	ATF796
541	Sliding Door	4mm Tgh	28 (-1;-2)	ATF797
542	Sliding Door	20mm IGU (6mm/8mm Air/6.38mm Lam)	33 (-1, -3)	ALA 17-086-9
542	Sliding Door (with rail stiffeners)	20mm IGU (6mm/8mm Air/6.38mm Lam)	34 (-1, -3)	ALA 17-086-10
542	Sliding Door (with rail stiffeners)	10mm Glass	33 (-1, -3)	ALA 17-086-11
542	Sliding Door (with rail stiffeners)	6mm Glass	31 (-1, -2)	ALA 17-086-12
548	French Door System Outward Opening	5mm Tgh/9mm Air/5mm Tgh	33 (-2; -4)	ATF803
548	French Door System Outward Opening	6.38mm Lam	32 (-2; -3)	ATF804
602	Sliding Window	20mm IGU (6mm/8mm Air/6.38mm Lam)	34 (-1, -3)	ALA 17-086-7
601	Sliding Window	4mm Float	31 (-1;-2)	ATF1198
601	Sliding Window	10.38mm Lam	35 (0;-1)	ATF1199
601	Sliding Window	6.38mm Lam	33 (0;-1)	ATF1200
601	Sliding Window	4mm float/8mm Air/4mm Float	32 (0;-2)	ATF1201
613	Double-Hung Window	6.38mm Lam	30 (0;-1)	ATF1320
614	Sashless Double Hung	6mm float	26 (0;0)	ATF1202
616	Awning Window	4mm float	32 (-2;-3)	ATF1210
616	Awning Window	6.38mm Lam	34 (-1;-2)	ATF1211
616	Awning Window	10.38mm Lam	36 (-1;-2)	ATF1212
616	Awning Window	6mm/12mm Air/6mm	35 (-1;-3)	ATF1213
616	Awning Window	10.5mm VLam Hush	37 (0:-3)	ALA 16-090-4
616	Awning Window	12.5mm VLam Hush	38 (0:-3)	ALA 16-090-3
618	MAGNUM™ Sliding Door	6.38mm Vlam Hush™	32 (0;-2)	4867-16

ACOUSTICS TESTED WINDOWS & DOORS

AWS PRODUCT SOLUTIONS

Series	Description	Glass	Rw (C;C_{tr})	Test Report
618	MAGNUM™ Sliding Door	10.5mm Vlam Hush™	34 (0;-2)	4867-17
618	MAGNUM™ Sliding Door	6.5mm VLam Hush™ / 8Air / 5mm Toughened	35 (-1;-4)	4867-18
622	FrontGlaze™ Wide Gap Framing	10.76 Lam	38 (-1,-2)	AC-PR0038F-CT-01
622	FrontGlaze™ Wide Gap Framing	12.76 Lam	39 (-1,-2)	AC-PR0038G-CT-01
626	FrontGLAZE™ Double Glazed Framing	6mm/12mm Air/6mm	32 (-2,-5)	AC-PR0038J-CT-01
626	FrontGLAZE™ Double Glazed Framing	10.5mm VLam Hush™	38 (-1,-4)	ALA 16-090-5
626	FrontGLAZE™ Double Glazed Framing	12.5mm VLam Hush™	39 (-1,-3)	ALA 16-090-6
642	Commercial D'Stacker Door	12.5mm Vlam Hush™	37 (0,-2)	ALA-16-090-16
646	SoundOUT™ FrontGLAZE™	12.50mm VLam Hush™ / 87.5Air / 12.50mm VLam Hush	51 (-2,-6)	14-086-01
646	SoundOUT™ FrontGLAZE™	10.50mm VLam Hush™ / 87.5Air / 10.50mm VLam Hush	50 (-1,-5)	14-086-02
646	SoundOUT™ FrontGLAZE™	10.38mm VLam / 87.5Air / 10.38mm VLam	46 (-2,-5)	14-086-03
646	SoundOUT™ FrontGLAZE™	10.5mm VLam Hush™ / 92.5Air /6.50mm VLam Hush	50 (-2,-6)	14-086-04
646	SoundOUT™ FrontGLAZE™	6.5mm VLam Hush/97.5Air/6.5VLam Hush	48 (-2,-6)	14-086-05
646	SoundOUT™ FrontGLAZE™	6.38mm Lam /97.5mm Air/6.38mm Lam	43 (-2,-6)	14-086-06
665	Commercial Awning Window	6mm/12mm Air/6.38mm Lam	37 (-2,-6)	AC-PR0038H-CT-01
665	Commercial Awning Window	6mm/12mm Air/6mm	33 (-1,-4)	AC-PR003I-CT-01
665	Commercial Awning Window (AF)	6mm/12mm Air/6.38mm Lam	33 (-2,-4)	AC-PR0038C-CT-01
665	Commercial Awning Window (A,F)	6mm/12mm Air/8.38mm Lam	38 (-1,-4)	AC-PR0038D-CT-01
704	SlideMASTER™ Sliding Door	6.38mm Lam	30 (0;-1)	ALA10-080
704	SlideMASTER™ Sliding Door	10.38mm Lam	31 (-1;-1)	ALA10-080
704	SlideMASTER™ Sliding Door	10.5mm Vlam Hush™	33 (0;-2)	ALA10-080
704	SlideMASTER™ Sliding Door	6.38mm/11.24mm Air/6.38mm	33 (-1,-3)	14-087-01
704	SlideMASTER™ Sliding Door	10.38mm/7.62mm Air/6mm Tgh	35 (0, -2)	14-087-02
726	Thermally Broken Awning Window	8.5 Vlam Hush™/10mm Air/6.5 Vlam Hush™	41 (-1;-5)	4867-12
726	Thermally Broken Awning Window	6.5 Vlam Hush™/12mm Air/6mm Tgh	40 (-1;-5)	4867-13
731	Thermally Broken Sliding Door	8.5 Vlam Hush/10mm Air/6.5 Vlam Hush™	37 (-1,-3)	4867-14
731	Thermally Broken Sliding Door	6mm Tgh/12mmAir/6.5 Vlam Hush™	37 (-1,-4)	4867-15
804	Thermally Broken CentreGLAZE™	8.5 Vlam Hush™/10mm Air/6.5 Vlam Hush™	39 (-1;-6)	4867-3
804	Thermally Broken CentreGLAZE™	6.5 Vlam Hush™/12mm Air/6mm Tgh	37 (-1;-5)	4867-4
	Sliding Window	3mm/13mm Air/3mm	30 (-1;-3)	ATF815
	Sliding Window	6.38mm Lam	31 (0;-1)	ATF818
	Sliding Window	7.52mm Lam	31 (0;-1)	ATF819

AWS
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ABN 48 067 950 903
awsaustralia.com.au
specifyaws.com.au

FOR TECHNICAL SUPPORT & FABRICATOR LOCATIONS
CALL **1300 026 189**
or email marketing@awsaustralia.com.au

HEAD OFFICE
76-78 Jedda Road Prestons NSW 2170
PO BOX 311 Liverpool NSW 1871, Australia

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