ACOUSTICS
BACKGROUND INFORMATION

PART E

With any new commercial or domestic building development, renovation or replacement project, consideration should be given to the acoustic requirements of the windows.

Windows are often a poor barrier to noise from external sources entering your home, such as road and rail traffic, planes or just general neighbourhood noise, and the type of windows chosen can make a great difference to the internal environment.

The standard unit for measuring sound pressure levels is the decibel, abbreviated to dB where 0dB is the lower threshold of normal hearing and 130dB is the upper threshold of pain. A change of 3dB is only just perceptible whereas 5dB would be clearly noticeable and an increase of 10dB is roughly equivalent to a doubling of loudness.

The annoyance produced by noise depends on a variety of factors including frequency and as a result, different scales have been derived to allow for these factors including dB(A), a scale used to measure mid-frequency noise which is most discernible to the human ear.

The soundproofing characteristics of building components is measured in dB(Rw) values. Known as the weighted sound reduction index, it is a laboratory-measured rating used to describe the ability of a window or door to provide sound insulation across a wide frequency range – the higher the number, the better the performance.

To take into account low frequency noise such as road & rail traffic, a correction factor (Ctr) has been introduced to the Rw scale and this is expressed as dB(Rw+Ctr).

When selecting products, such as soundproofing windows, it is vitally important to compare whole window test results rather than just a declared performance value of the glass because the quality of the frame construction, the assembly of weather seals and gaskets and the closing tightness of opening lights has a significant impact on actual performance.

Westcoast Windows provide 3rd Party independently tested standard entry level windows and doors with superior sound reduction of 34 dB(Rw) and 29 dB (Rw+Ctr) and can provide a huge selection of tested combinations of opening windows, fixed lights and doors up to 48 dB(Rw).

ACOUSTICS
ACOUSTIC TEST REPORT SUMMARY

PART E

CHILTERN DYNAMICS PHYSICAL TESTS

Report No.	Product	Glazing Specification	Whole Window Noise Reduction		
			R_w (dB)	$R_w + C$ (dB)	$R_w + C_{tr}$ (dB)
F12022/P006	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	46	45	42
F12022/P001	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	46	45	41
F12022/P008	TSG180	66.2 VSG Sil-10Ar-4 float-12Ar-44.2	46	45	41
F12022/P007	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	44	44	41
F12022/P009	TSG180	66.2 VSG Sil-10Ar-4 float-12Ar-44.2	44	43	40
F12022/P005	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	43	42	39
F12022/P020	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	43	43	39
F12022/P016	TSG180	10 float-20Ar-33.1 VSG Sil	43	42	37
F12022/P017	TSG180	10 float-20Ar-33.1 VSG Sil	42	41	37
F12022/P014	TSG180	10 float-20 Ar-33.1 VSG	41	39	35
F12022/P015	TSG180	10 float-20 Ar-33.1 VSG	40	39	35
F12022/P012	TSG180	4 float-18Ar-33.1 VSG Sil	40	38	33
F12022/P013	TSG180	4 float-18 Ar-33.1 VSG Sil	39	37	33
F12022/P011	TSG180	4 float-18 Ar-33.1 VSG	38	37	33
F12022/P018	TSG180	4 float-20Ar-4 float	35	34	30
F12022/P019	TSG180	4 float-20Ar-4 float	35	34	29
F12022/P026	FKG	88.2 VSG Sil-18 AR-66.2 VSG Sil	48	47	41
F12022/P028	SHID	66.2 VSG Sil-15 Ar-44.2 VSG Sil	43	42	38
F12022/P027	FDG	66.2 VSG Sil-15 Ar-44.2 VSG Sil	42	41	38

R_w is calculated according to SS-EN ISO 717-1 R_{Atr} according to NT ACOU 061 (= $R_w + C_{tr}$ according to ISO 717-1)

ACOUSTICS
ACOUSTIC TEST REPORT SUMMARY

PART E

SWEDISH INSTITUTE (SP) PHYSICAL TESTS

Report No.	Product	Glazing Specification	Whole Window Noise Reduction		
			R_w (dB)	$R_w + C$ (dB)	$R_w + C_{tr}$ (dB)
P503584 Enc. 1	TSG180	33.1 VSG Sil-15air-6 float	39	37	33
P503584 Enc. 2	TSG180	44.1 VSG Sil-20air-8 float	42	40	36
P503584 Enc. 3	TSG180	66.1 VSG Sil-15air-WSG Sil 44.2	44	42	39
P503584 Enc. 4	TSG180	66.1 VSG Sil-15air-WSG Sil 44.2*	46	44	40
P503584 Enc. 5	TSG180	8 float-15air-4 float	37	36	33
P603528 Enc. 1	SHI	8 float-15air-4 float	36	35	32
P603528 Enc. 2	SHI	33.1 VSG Sil-15air-6 float	37	35	31
P603528 Enc. 3	SHI	44.1 VSG Sil-20air-8 float	40	39	34
P603528 Enc. 4	SHI	66.1 VSG Sil-15air-WSG Sil 44.2	40	39	35
P603528 Enc. 5	SHI	66.1 VSG Sil-15air-WSG Sil 44.2**	44	43	38
P603528 Enc. 6	SHI	44.1 VSG Sil-20air-8 float	43	41	35

* Sash sealed with tape ** Additional weather strip

SWEDISH INSTITUTE (SP) CALCULATED TESTS

Report No.	Glazing Unit	Glazing Specification	Whole Window Noise Reduction	
			R_w (dB)	$R_w + C_{tr}$ (dB)
Px01680-en	Double	4 float-20Ar-4 float	34	29
Px01680-en	Double	4 float-18Ar-33.1 VSG	37	32
Px01680-en	Double	6 float-18Ar-4 float	37	32
Px01680-en	Double	10 float-12Ar-33.1 VSG	41	36
Px01680-en	Triple	4 float-12Ar-4 float-12Ar-4 float	34	29
Px01680-en	Triple	6 float-10Ar-4 float-12Ar-4 float	37	31
Px01680-en	Triple	4 float-12Ar-4 float-10Ar-33.1 VSG	38	32
Px01680-en	Triple †	4 float-38air-4 float-12Ar-4 float	41	35

† 2+1 coupled sash

R_w is calculated according to SS-EN ISO 717-1 R_{Atr} according to NT ACOU 061 (= $R_w + C_{tr}$ according to ISO 717-1)

ACOUSTICS
TERMINOLOGY & FAQs

PART E

AMBIENT NOISE

Ambient noise includes all sound present in a given environment. This usually includes sounds from many sources both near and far.

dB

The unit of measurement of sound. dB is an abbreviation of decibel. Variations of dB are used for different types of noise measurement. Most commonly dB (A).

dB (A)

The 'A' weighting scale is used to measure noise that corresponds roughly to the overall level of noise that is discerned by the average human ear. The human ear is more susceptible to mid-frequency noise than high and low frequencies and therefore this 'A 'weighting approximates the sensitivity of the human ear by filtering only these frequencies.

FREQUENCY

The number of vibrations of sound waves emitted per second is known as the frequency and is expressed in Hertz. Building acoustics is concerned with frequencies of the 50 to 5,000 Hz range. These are divided into bands of frequencies or octaves.

R_w

Known as the weighted sound reduction index. It refers to the ability of a building structure to provide sound insulation. The higher the number, the better sound insulation.

$R_w + C$

C is the value added to R_w to take into account the characteristics of particular medium and high frequency noises i.e. music, TV and speech (sometimes collectively called pink noise).

$R_w + C_{tr}$

C_{tr} is the value added to R_w to take into account the characteristics of particular medium and low frequency noises i.e. urban traffic, distant aircraft.

FREQUENTLY ASKED QUESTIONS

HOW DOES ACOUSTIC LAMINATED GLASS WORK?

A PVB (Polyvinyl Butyral) interlayer is sandwiched between glass panes to absorb sound and help keep noise out of the building. The thickness of these sandwiching panes as well as the configuration of other glass panes and cavity spacing within double or triple glazing can dramatically effect the sound performance of the overall glass unit.

CAN SOUND PERFORMANCE OF A WINDOW BE DETERMINED BY THE GLASS ALONE?

No. The choice of window frame will effect the overall insulating performance of the entire window. Poor quality frames can allow sound to penetrate. A real physical test of the window frame and glass together is the only true way of achieving trusted performance data.