Insulating Glass Units and Acoustics

Sound Reduction

The sound reduction provided by glazing may be represented by a number of different indices. The most commonly used in the UK and Ireland is the R_w or Weighted Reduction, which incorporates a correction for the ear's varying sensitivity at different frequencies. The R_w is measured in decibels (dB), e.g. the sound reduction of a 6/12/6 insulating glass unit is 33 dB R_w.

The second most common indices is the R_{tra} or reduction of road traffic noise, which is used specifically to relate sound reduction of typical traffic noise. This is measured in dBA (A-weighted decibels), e.g. the performance of a 6/12/6 insulating glass unit with regard to traffic is 30dBA R_{tra}.

Recently, European Standards have been introduced, which present the sound reduction as adaptation factors $R_w(C, C_{tr})$, where R_w is the weighted sound reduction, C is the adaptation term for medium to high frequencies such as radio, TV, etc. and C_{tr} is the traffic noise reduction adaptation factor that must be added to the R_w to provide the traffic noise reduction, e.g. the performance of a 6/12/6 insulating glass unit is now written; $R_w(C, C_{tr}) = 33(-1;-3)$.

Insulating Glass

Our insulating glass units may be designed to provide enhanced acoustic insulation. Selection of suitable glass thickness and type for each pane is essential to obtaining the optimum performance. Glass thickness should differ by at least 30% in order to minimise the risk of sympathetic resonances within the unit, i.e. 10mm + 6mm or 4mm + 8mm. Further benefits may be gained from including laminated glass products, where the interlayers can improve the sound insulation by absorbing additional mid to high frequency sounds.

Cavity widths in the normal range of 6mm to 20mm, between the panes in double glazing units, provide similar performances, with no significant variation in sound reduction.

The inclusion of argon gas within the cavity of an insulating glass unit will exhibit a similar acoustic performance as units with the same glass combination and air in the cavity.

The acoustic performance of either symmetrical or asymmetric units is identical where two panes of monolithic glass are used, irrespective of which way round the units are installed, i.e. 6mm float / 16mm cavity / 8mm float, will perform exactly the same as 8mm float / 16mm cavity / 6mm float. To maximise the acoustic benefits, the laminated pane of an insulating glass unit may be glazed to the warmer side, usually inside of the building.

Triple Glazing

Triple glazing units do not always improve the noise reduction in comparison to double glazing, i.e. test data should be considered prior to selection of any glazing.

Spandrel Glass

The acoustic performance of our spandrel panels, may have a small improvement in the higher frequencies, but it is not possible to be accurate without acoustic performance tests for the insulation and unit combination. The performance of the glass alone is a reasonable guide to the acoustic performance; however, some insulation is fixed inside insulation trays, which may produce a lesser performance at lower frequencies.

Insulating Glass Units and Acoustics

IGU	Frequency - Hertz						R_w	$R_w + C$	$R_w + C_{tr}$
	125	250	500	1000	2000	4000			
4/16/4	24	18	26	40	45	39	30	29	26
4/16/6	24	21	29	43	43	45	34	33	29
4/16/4/16/4	18	20	29	44	50	43	32	31	27
6/16/6	20	20	30	40	35	44	33	32	30
6/16/6.4	21	22	31	39	38	47	35	34	31
6/16/6.8A*	23	24	34	42	43	52	38	36	33
6/16/8	20	27	37	43	36	51	37	36	32
6/16/8.8	26	27	36	43	42	53	38	37	33
6/16/8.8A*	24	28	39	48	46	56	41	39	35
6/16/10	26	27	34	40	38	46	38	36	32
6/16/10.8	25	27	34	41	41	50	39	37	34
6/16/10.8A*	25	28	43	46	44	55	42	39	35
6/16/12	27	27	35	41	39	48	40	38	33
6/16/12.8	28	29	37	42	43	49	42	40	35
6/16/12.8A*	28	29	39	47	46	49	43	40	36
8/12/6/12/8.4A*	25	32	42	50	52	61	44	42	37
8/16/8	22	23	30	37	35	47	32	30	29
8/16/8.8	26	26	34	41	41	56	37	36	32
8/16/9.5	26	27	36	41	42	56	38	37	33
8/16/10.8	28	30	37	42	41	53	40	39	37
8.8/12/6/12/10.8	29	34	45	53	54	66	47	45	40
8.8A/16/10.8A*	24	36	44	53	52	63	45	43	39
8/16/10.8A*	24	31	41	46	46	59	42	40	36
8/16/12.8A*	25	34	41	44	46	62	43	41	37
10/16/8.4A*	25	33	43	48	51	61	44	42	38
10/16/9.5A*	26	34	44	47	50	61	45	42	38
10/16/10	28	29	36	36	38	47	35	34	32
10/16/10.8A*	27	34	43	47	52	64	45	43	38
10/16/12.8A*	30	32	40	41	46	59	43	41	38
10/16/16.8A*	31	38	43	44	50	61	45	43	40
12.8A/16/16.8A*	34	41	47	53	61	68	51	50	46

The information quoted in this publication is only relevant to the performance of our products.

This publication gives a general description of the products and materials. It is the responsibility of the user to ensure that their use is appropriate for any particular application and that such application complies with all relevant local and national legislation, standards, codes of practice and other requirements.

The Company hereby disclaims all liability however arising from any error, or omission from this publication and for all consequences of relying on it.

*A – In the above table denotes an acoustic PVB interlayer laminate