

The Acoustic Performance of Insulating Glass Units

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. This is measured in decibels (dB), e.g. the performance of a 6/12/6 insulating glass unit is $R_w = 33$ dB.

The second most common indices is the RTRA 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 RTRA = 30dBA.

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 C_{tr} , e.g. the performance of a 6/12/6 insulating glass unit is now written as $33(-1;-3) = R_w(C, C_{tr})$, where $R_w = 33$, $C = 32$ and $C_{tr} = 30$.

Ravensby Glass products may be incorporated into insulating glazing units. These 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 be different 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.

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 the same acoustic performance as units with the same glass combination and only air in the cavity.

The acoustic performance of both symmetrical and asymmetric units is identical, irrespective of which way round the units are installed, i.e. 6mm float / 16mm cavity / 8.8mm PVB laminate will perform exactly the same as 8.8mm PVB laminate / 16mm cavity / 6mm float.

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

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