WEB BASED
APPLICATION SPECIFIC
INSTALLATION INSTRUCTIONS

Sound and Noise Control

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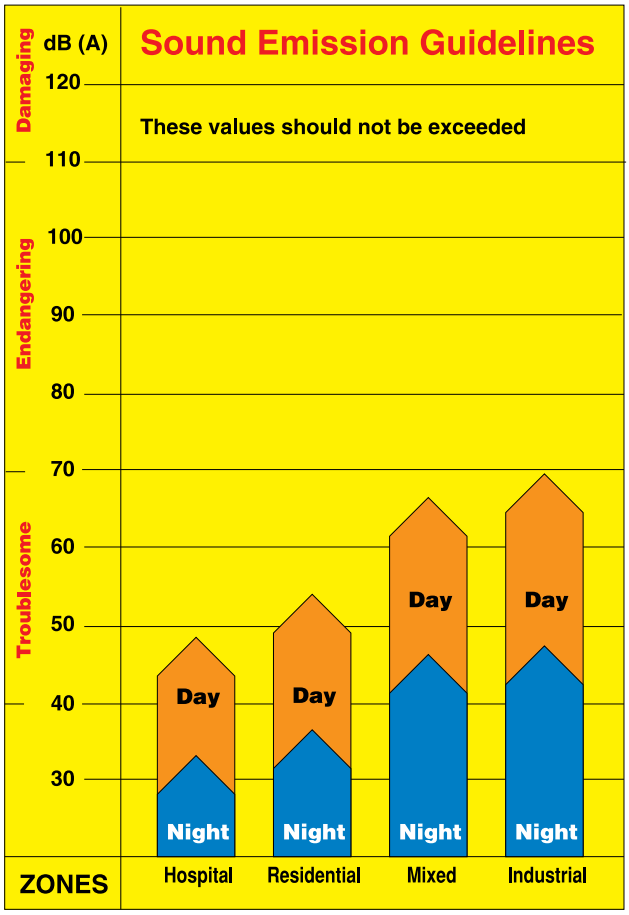
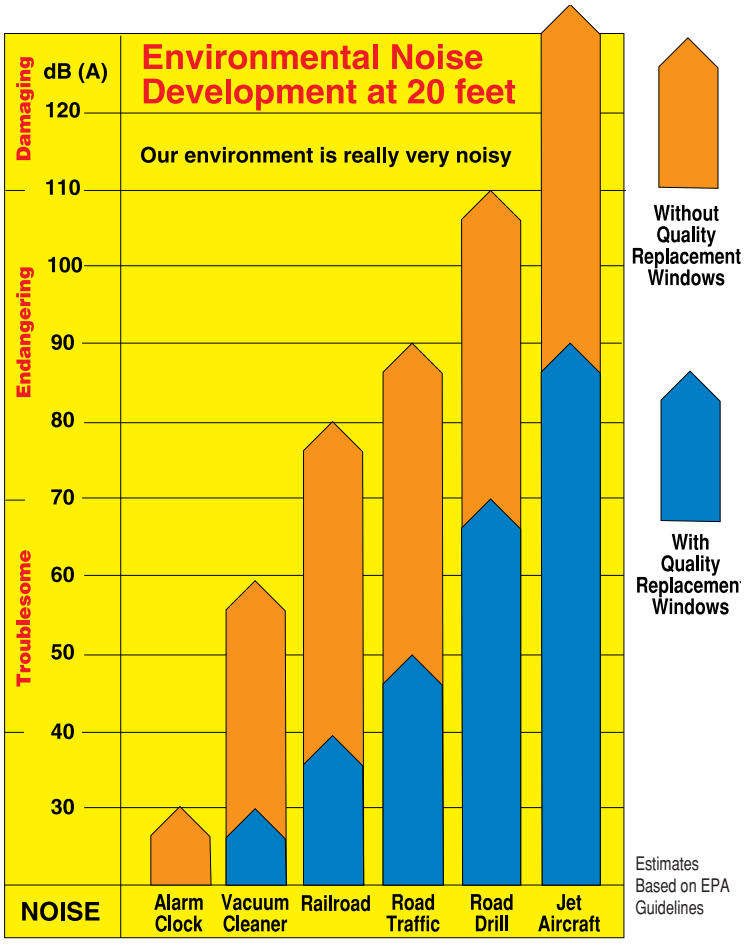
Reducing Noise Levels

The least spoken of advantage to new windows, but perhaps one of the kindest of all, is the sound transmission reduction a quality window offers over old windows. Quality Vinyl Replacement Windows can reduce interior noise levels up to 40 db which is the equivalent of silencing an alarm clock. This can be very important when living on a busy street, across from a commercial area, or near a busy street, highway, train station or airport.





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Sound Control Qualities of Windows and Glazing

Windows and doors have always been center to the separation of the outside environment and the inside living area, but the benefits have usually been limited to cold, heat, sun, rain and other weather related variables.

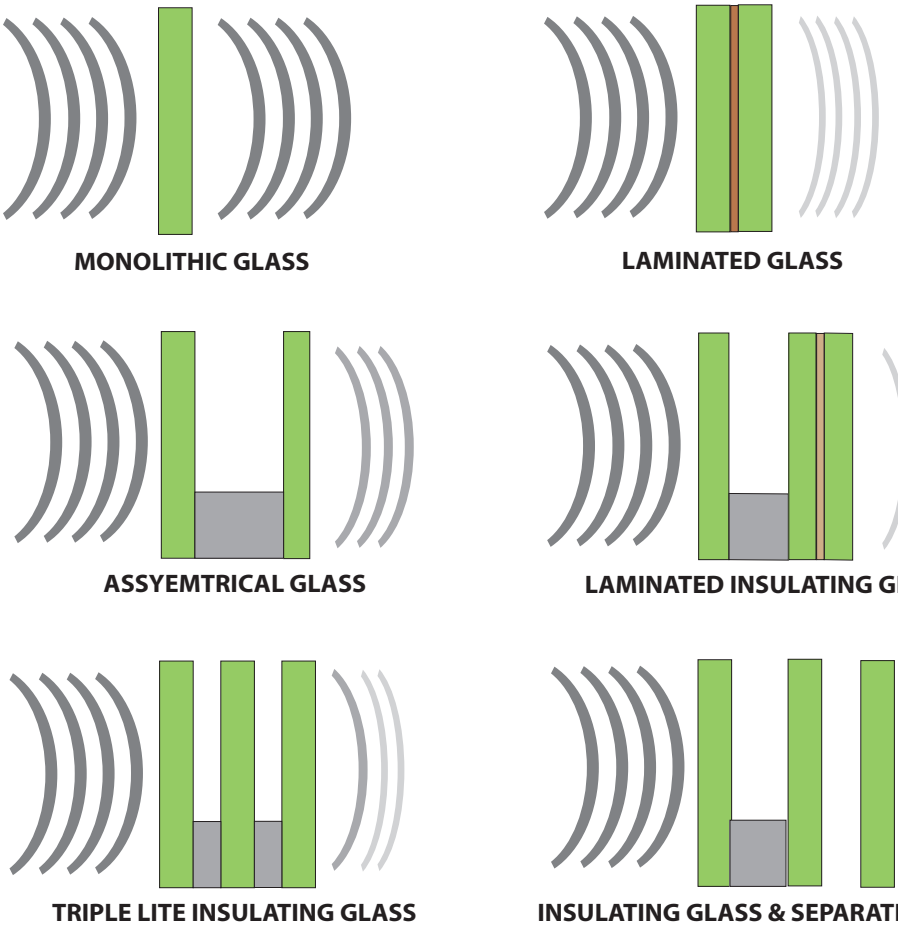
Exterior noise is becoming more of a focus when improving homes because noise pollution becomes more of a problem as areas become built up and traffic and other transportation caused noise is being identified as harmful.

The trend began from two sources. One has been the need to help homes built around airports to insulate the living areas from the noise of big jets taking off and landing. The other has been the unexpected benefit of improving glass technologies either by multiple panes for energy efficiency or lamination for protection against breakage.

Sound travels through windows and doors via air infiltration (think of an open window versus a closed one) through the unit and due to vibrations in the window's glazing and frame components. To reduce sound transmission, improvements can be made to include weather stripping to reduce air infiltration, using multiple panes of glass and other materials of varying thickness, and even adding a storm window (inside or out) to create an additional barrier.

So, interrupting the sound path by interrupting air flow, or vibration path or decreasing sympathetic vibration by increasing the space between surfaces or making touching surfaces of unequal thickness are the most effective methods. Singularly they can make a difference. Combining the options in window and door systems can make the noisiest outside environments quiet on the inside of the building.

TYPES OF SOUND CONTROL GLAZING



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There are two classifications for noise control by comparing Sound Transmission using either STC (Sound Transmission Class) or OITC (the Outside Inside Transmission Class). STC rating is the result of the measurement of 16 frequencies after passing through a barrier while OITC measures the attenuation ability of a barrier but more weighted to the lower frequencies associated with traffic, aircraft and other transportation caused noise. Suffice is to know that STC numbers are usually higher than OITC, and the differences between them tend to stay reasonably constant.

The key to blocking sound transmission through a window is breaking up the sound waves, and manufacturers employ a variety of technologies to achieve that goal.

Standard impact-resistant laminated glass reduces noise because the (PVB) interlayer has a different density from the glass, breaking up the sound. A standard insulated window with one layer of laminated glass would have an STC of around 32 to 35, a significant improvement from a standard insulated window with an STC of about 29 or less.

Adding a storm panel or an additional monolithic pane to the window can push STC ratings to 39 or higher. Sound needs air to move, so the 1/2; inches to 3 inches of dead air space between the primary and secondary window causes the noise to die.

Asymmetrical Glazing (panes of glass of different thickness in one unit) is a another approach to reduce sound transmission often at a lower cost than laminated glass or storm panels, because as the sound wave travels through the different types of materials, it's broken into different frequencies which has the effect to “dissipate” the noise achieving STC ratings of 30 to 34 without laminate, and with a price premium as little as 3 percent to 20 percent. The technique also can be combined with other technologies to further improve he window's sound abatement.

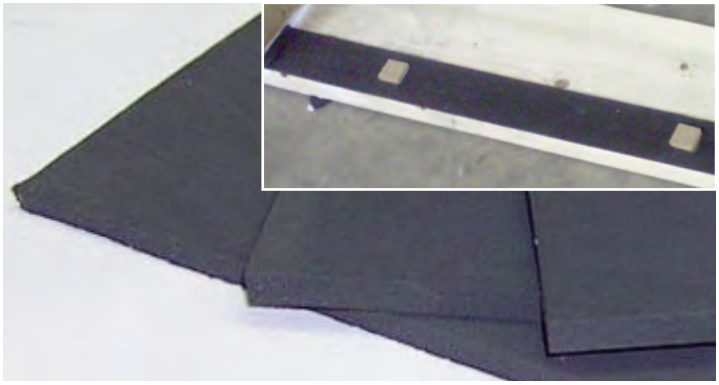
The best-performing sound-control windows take a systems approach, incorporating combinations of glass thickness, multiple units and lamination.

Installation

Because the goal of Sound Control Windows and Doors is to both block and breakup the path of the sound through the window or door unit, it is especially important to use noise abatement materials to surround the window in the cavity (dense foam is the best), and prevent as much vibration transfer between the wall and the window (utilize neoprene sound isolation shimming, for example).

It is even desirable to use neoprene, cork (or other similarly performing material) sill shims to rest windows on which will significantly contribute to the dampening effects the use of other sound mitigation materials will afford.

The key is to isolate the window or door unit in the cavity, sort of “suspend” it, while doing everything possible to fully integrate the window or door into the water management system of the wall.



Finally, the frame material of the window or door can be a major influence on the sound transmission properties. Composite, wood or uPVC windows are best because they have less vibration tendencies that metal window products.

The following charts show a variety of comparative STC ratings. The object in noise abatement is to get the window or door’s performance as close as possible to the wall it is in. More than that is wasted.

For quick reference, a normal glazing panel of dual pane glass has STC of 29. Asymmetrical laminated dual pane has STC over 35. That creates a window that attenuates more than 90% of exterior noise to a performance level equal to tradiona; 16” on-center wall with 5/8” sheetrock and 3-1/2” insulation battes.

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