

Noise Insulation Properties of Roller Shutters.

Independent laboratory tests on OZ Roll® roller shutters have demonstrated that OZ Roll® roller shutters can reduce noise transmission through a window opening. The noise reduction benefits obtained in university tests varied significantly depending on the frequency of the noise source. For low frequencies between 100 Hz and 300 Hz the roller shutters did not provide any benefits. However, for higher frequencies between 300Hz and 1250Hz the sound transmission loss was improved by 3-10 decibels. At higher frequencies (>1250Hz) the improvement in sound transmission loss with the roller shutter curtain down was typically greater than 10 decibels.

To understand how the change in sound levels (decibels) is perceived, the apparent change in loudness is shown in table 1

Table 1

Change in Sound Level	Change in Apparent Loudness
3 decibels	just perceptible
5 decibels	clearly noticeable
10 decibels	half as loud
20 decibels	much quieter

To understand how some common noises compare with changes in sound levels (decibels) and the predicted apparent change in loudness refer to table 2

Table 2

Noise	Reduction in Decibels	Predicted Subjective Response
City traffic (10m from kerb)	4 decibels	just perceptible - clearly noticeable
Urban motorway (40m from edge)	3 decibels	just perceptible
Jet airliner flying at 300m	6 decibels	clearly noticeable
Dishes being washed (kitchen)	10 decibels	perceived as half as loud
2 stroke whipper snipper at 7m	7 decibels	clearly noticeable
2 stroke lawn mower at 7m	4 decibels	just perceptible - clearly noticeable
Small dog barking at 5m	9 decibels	clearly noticeable - perceived half as loud.

Optimum noise reduction is achieved using an installation with silicone sealant applied between the head box and guides and the wall. To be effective the rest of the home must be sealed properly to ensure there are no air gaps which will allow sound to pass. These air gaps will significantly reduce the effectiveness of the roller shutter and noise reduction benefits will not be apparent

Notes: Noise reduction tests refer to noise reductions achieved in university tests through a closed sliding aluminium framed window with dimensions 1320*820mm. Fitted with a roller shutter (AR400 curtain) mounted ON WALL with silicone sealant applied under the head box and guides for optimum sealing of the roller shutter to the wall. The tests only show noise reduction through the roller shutter and no allowance is made for other noise transmission paths such as gaps around doors, ventilation and airconditioning holes in ceilings etc.

Thermal Insulation Properties of Roller Shutters.

Computer modelling tests using the NatHERS (National Housing Energy Rating Software) have been carried out on a typical project home and typical residential units located in Sydney, Melbourne and Perth with OZ Roll® roller shutters fitted to the windows. NatHERS gives an estimation of the heating and cooling loads on a given dwelling and results have shown the energy reductions and benefits of fitting OZ Roll® roller shutters

Potential savings on heating and cooling energy consumption for a whole year when using the OZ Roll® roller shutters in a detached residence is shown in table 1.

Table 1

	Sydney	Melbourne	Perth
Possible total annual heating and cooling energy savings	30%	25%	40%

Potential savings on heating and cooling energy consumption for a whole year when using the OZ Roll® roller shutters in residential units is shown in table 2.

Table 2

	Sydney	Melbourne	Perth
Possible total annual heating and cooling energy savings for both North and South facing windows.	27%	23%	59%
% Total annual heating and cooling energy savings for both East and West facing windows.	34%	26%	44%

Conclusions

The use of OZ Roll® roller shutters on the windows of a detached residence and residential unit complex in Sydney, Melbourne and Perth was found to provide significant energy savings for heating and cooling and therefore, reduced energy bills for consumers and also a reduction in greenhouse gas emissions. The roller shutters provide an environmentally friendly and energy saving cost efficient solution to heat loss in winter and summer heat gain.

Notes

Tests were carried out on a randomly chosen home design and also on residential unit plans provided by the University of New South Wales. It is assumed that thermal insulation would exist in the ceiling and walls of the house. The shutters would be closed in summer when high levels of sunlight were on the windows. The shutters should be opened in winter to let the sunlight in and closed at night to keep the heat in. Results will vary depending on the orientation of the house, the type of construction and the position and size of windows. Results will also vary depending on how the shutters are operated and the actual weather experienced.