Technical information, January 2021

Exolon®
Sound protection

Sound protection

Excess noise and continuous, disturbing noise are harmful. That is why the effect of noise needs to be kept down to a minimum. Particularly relevant in this context are sound protection in residential buildings and the shielding of road noise (noise barrier walls). Depending on the type of noise source, its location with respect to the area to be protected and the path via which the sound is transmitted, various sound protection measures are needed. Basically, a distinction is made between measures aimed at sound absorption via sound dissipation – meaning that the acoustic energy is converted into other forms of energy (usually heat) – and those used for sound reduction via reflection of the sound waves. Exolon® solid and multi sheets belong to the second category.
The sound pressure levels and the sound reduction indexes are expressed in decibel (abbreviated as dB).

The sound pressure level associated with the subjective loudness of common noise sources is given in Table 1.

Subjective loudness	Sound pressure level in dB (A)	Noise source
Painful	140	Jet aircraft takeoff in immediate vicinity
Intolerable	120	Pneumatic hammer at 1 m
	110	Night club
Extremely noisy	100	Motorcycle
Very noisy	90	Machine shop
Moderately noisy	80	City motorway
	70	Car traffic noise at approx. 50 km/h
Quiet	60	Business office
	50	Normal conversation
Very quiet	30	Whispering
	20	Ticking of a clock
	0	Threshold of hearing

Table 1

The human ear perceives an increase by 10 dB(A) as a doubling of the loudness, i.e. car traffic noise (70 dB) is twice as loud as business office noise (60 dB).

Sound reduction

R_w

For the practical assessment of the sound reduction, however, the “weighted sound reduction index”, R_w, which takes account of the subjective effect for the various frequencies, is used.

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Single-sheet glazing

Thickness in mm	Exolon® Rw [dB]
4	26
8*	30
10*	34
12*	36
15*	36
18*	37

*) Measured values Exolon® Silent Sound

By comparison, a 6-mm thick silicate glass sheet has the following reduction value:

R_w = 31 dB

A 10-mm thick Exolon® sheet with an area weight of 12 kg/m^2 therefore has a higher sound reduction effect as a 15-kg/m^2 silicate glass sheet.

Multi-sheet glazing

Multi-sheet glazing is possible by combining 2 or more Exolon® solid sheets or by using Exolon® multi-wall sheets.

A significant sound reduction can be obtained by combining solid sheets.

Exolon® in mm	Air space in mm	Exolon® in mm	Rw [dB]
4	50	4	31
4	150	4	39
6	30	6	32
10	30	10	40
10	60	10	45

Exolon® multi-wall sheets have the advantage of being a compact system.

Exolon® multi UV	Rw [dB]
2/6	17
2/8	19
2/10	20
3/16	21
4/10	17
5M/32	18

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