

## **Technical information, January 2021**

Exolon<sup>®</sup> 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<sup>®</sup> 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.

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

#### $\mathbf{R}_{w}$

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.

Subjective loudness	Sound pressure level in	Noise source	
	dB (A)		
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

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### Sound reduction indexes

### Single-sheet glazing

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

\*) Measured values Exolon<sup>®</sup> Silent Sound

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

### R<sub>w</sub> = 31 dB

A 10-mm thick Exolon<sup>®</sup> sheet with an area weight of  $12 \text{ kg/m}^2$  therefore has a higher sound reduction effect as a 15-kg/m<sup>2</sup> silicate glass sheet.

## Multi-sheet glazing

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

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

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

Exolon<sup>®</sup> multi-wall sheets have the advantage of being a compact system.

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

Exolon Group NV Wakkensesteenweg 47 8700 Tielt

Belgium

www.exolongroup.com sales@exolongroup.com

