

Report

Subject: The sound insulation of daylighting systems, brand Solatube
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1. Introduction

At the request of Techcomlight at Ederveen and in cooperation with Grontmij Technical Management at Amersfoort (The Netherlands), tests have been carried out in the Laboratory for Acoustics of Peutz bv, at Mook, The Netherlands.

The aim of the tests is to determine the sound insulating quality of the Solatube daylighting system. The full test results are given in test report A1942-1E dated 12 March 2010 where a full description is given of the standards, guidelines, materials used, construction, test methods and measurement tolerances.

This report gives a summary of the test results expressed in sound insulation R and sound insulation figures are given for other translucent materials for comparative purposes.

2. Summary

There are different methods to express the airborne sound insulation of a system using a single number rating. For laboratory tests the single-number quantities are calculated in accordance with the ISO 717-1. In this report the weighted sound reduction index R_w and R_{Atr} (R_{Atr} takes the spectrum of road traffic noise into account).

The relation between the different single number ratings is explained in NPR 5079:1999.

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Table 1: Sound insulation of daylight systems; cavity 700 mm

type	Roof gap	Additional item	R _w	R _{Atr} (= R _w + C _{tr})
Solatube 330 DS-O	Ø 550 mm	-	37 dB	35 dB(A)
Solatube 330 DS-C	Ø 550 mm	-	32 dB	31 dB(A)
Solatube 330 DS-C	Ø 550 mm	Natural effect lens	45 dB	41 dB(A)

3. Comparitive sound insulation values

To gain an insight into the acoustical qualities of Solatube daylighting systems, some airborne sound insulation values of other translucent materials are given in table 2. The values in table 2 are based on the archive of Peutz Laboratory and figures given in NPR 5272:2003.

Table 2: Comparison of the sound insulation of some translucent materials

system	R _w	R _{Atr} (= R _w + C _{tr})
Polycarbonate structural sheet, t = 16 mm	19 dB	17 dB(A)
Roof window, single glazed, t = 4 mm	30 dB	27 dB(A)
Roof window, double glazed, t = 4-12-4 mm	33 dB	29 dB(A)
Solatube 330 DS-O	37 dB	35 dB(A)

4. Conclusion

The required sound insulation of the external surface of a building, where daylighting systems are used differs per situation. Sometimes maximum indoor sound levels are required due to external sound levels (for instance traffic noise) and sometimes high internal sound levels have to be reduced to acceptable levels for surrounding dwellings. The height of the sound levels, the distance between source and receiver and the maximum permissible received level gives the required sound insulation of the building.

With the sound insulation values as given in report A 1942-1E there is now information available to calculate the airborne sound insulation of a building façade which consists of different elements including Solatube daylighting systems.

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