

VOLUME DEPENDENT IMPACT SOUND INSULATION

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1. INTRODUCTION

Impact sound insulation requirements in dwellings in the Nordic countries are based on the “weighted normalized impact sound pressure level”, $L'_{n,w}$. The requirements in these countries are more or less in accordance with or based on INSTA 122.

2. VOLUME DEPEDANCE

The field values of $L'_{n,w}$ do not necessarily correspond to the experienced annoyance, especially in large rooms. In concrete buildings, the vertically measured $L'_{n,w}$ values often increase with increasing room size. Sweden and Norway have introduced volume limitations in their requirements, to limit unwanted “restrictions” for large connected volumes.

Experience has shown that the $L'_{n,w}$ -value for concrete slabs often increases in direct proportion to the volume. Thus the increase is often larger than values obtained for instance with the program Bastian, which is based on EN 12354.

3. “CASE”

This paper presents a case that was brought to court. In this project the hall, the kitchen and the living room was connected in one big room with a total area of about 58 m² and a volume of 138 m³. The measured $L'_{n,w}$ was about 5 dB higher than in the sleeping rooms, which had about one third of the size. The measured $L'_{n,w}$ -values did not fulfill the requirement in the large rooms. However, the measured sound pressure levels were similar to the levels in the small rooms,

where the structure was similar and the requirement was fulfilled.

Most of the acoustic evaluations presented to the court will be shown. The effect of volume is discussed and reference is given to the “weighted standardized impact sound pressure level”, $L'_{n,w,T}$. The latter is not volume dependant in the similar way.

4. CONCLUSIONS

The “weighted normalized impact sound pressure level”, $L'_{n,w}$ may increase significantly with increasing volume in concrete buildings. This is more related to the definition of the term than to the real sound pressure levels. If no volume limitation is connected to the limit values, the reduction of the impact sound pressure level, ΔL , must be better in large rooms than in smaller rooms.