



INVESTIGATION OF IMPACT SOUND PRESSURE LEVEL REDUCTION OF FLOATING FLOOR USING THE SMALL SPECIMENS IN THE REAL BUILDING

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Abstract. Floating floor construction is the best solution for impact sound insulation [1-4]. Weighted reduction of impact sound pressure level ΔL_W (dB) for evaluation of the new floor constructions is used. For determination of ΔL_W measurements in the laboratory according to LST EN ISO 10140 series standards with big specimens (area $>10\text{m}^2$) are to be performed. But it is impractical in the case when quick evaluation of new constructions is needed. The solution could be to do tests using small specimens (area $<10\text{m}^2$) in the real building. For that purpose it was decided to perform test using simple floating floor construction: 220 mm hollow concrete slab, 50 mm stone wool and 50 mm sand/cement screed [5]. The dependence of ΔL_W value from the size of the specimen (area $<10\text{m}^2$) was determined (Fig. 1) [5].

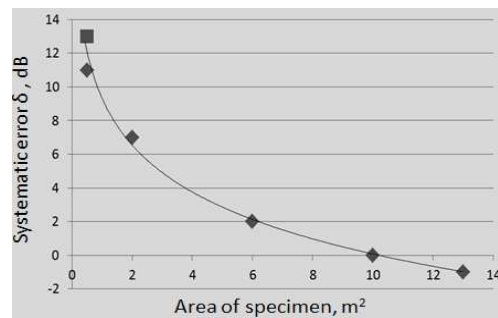


Fig. 1. The systematic error $\delta \Delta L_W$ dependence

It was decided to repeat the experiment with another floating floor construction often used in new buildings in Lithuania. The floor construction consisted of layers: 160 mm monolithic concrete slab, 50 mm layer of sand, 4 mm resilient layer (SK3 mat) and 50 mm sand/cement screed. The purpose of the test was to look does the same dependence also exist. The impact sound pressure levels (L'_n) were measured [6] and evaluated [7] in one-third octave bands in the frequency range from 50 to 5000 Hz of specimens changing its area from 13.8 to 0.5 m². Results of the research showed that the systematic error $\delta \Delta L_W$ dependence from the specimen area exist in less degree (Fig. 2).

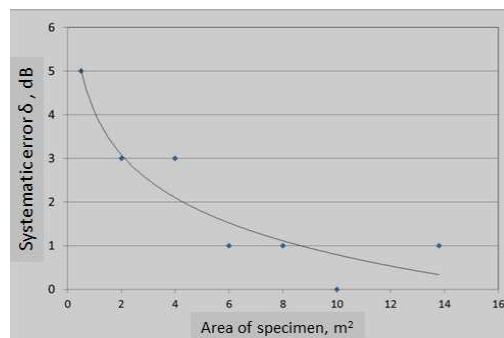


Fig. 2. The systematic error $\delta \Delta L_W$ dependence

Systematic error $\delta \Delta L_W$ increases decreasing the area of the specimen as it was in the previous test but does not meet the previously established log- Law (Fig. 1). So it shows that different floor constructions gives different systematic errors $\delta \Delta L_W$ of the same size small specimen. Therefore, more different floating floor constructions should be tested to determine dependence of $\delta \Delta L_W$ value from the size of the specimen.

Keywords: impact noise, measurement methodology, thin mat, small specimen, systematic error.

References

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