



INVESTIGATION OF THE INFLUENCE OF INCIDENT ANGLE AND FREQUENCY DEPENDENCE OF A CEILING ABSORBER ON ROOM ACOUSTIC DESCRIPTORS

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Background:

As regards acoustic design, it is an advantage if different designs and procedures can be evaluated objectively. For this purpose, a number of measurable room acoustic descriptors have been defined. These descriptors can be used to formulate room acoustic specifications and to check the effect of different procedures. It would, of course, have been an advantage to have only one descriptor that works in all rooms. But hearing is multidimensional, so several descriptors are required.

In this project the influence of an absorbent ceiling treatment on room acoustic descriptors will be investigated. The angle and frequency dependence of different ceiling treatments will be estimated from general specification of absorber properties like flow resistance, thickness of absorber and mounting condition. The influence on room acoustic descriptors will be measured in a scale model of a typical classroom. Acoustic descriptors to be investigated are reverberation time (T20, EDT), speech intelligibility (RASTI, C50) and sound strength (G).

Method:

- Estimation of angle and frequency dependence of a number of different ceiling absorber configurations. The software WinFLAG 2.3 is used for the estimations.
- The room acoustic parameters (T20, EDT, RASTI, C50 and G (alt rel. G)) are measured in a scale model 1:3 of a classroom. The measurements should be carried out both with and without sound scattering objects (furnishers) in the model.
- Ceiling absorbers to be tested:
 - ✓ Glass/Stone wool products with different surface layers, density and thickness
 - ✓ Perforated plaster boards absorbers
 - ✓ Glass/Stone wool with extra corner low frequency absorption
 - ✓ Multilayer absorber
- Measurements: Loudspeaker in corner position, five microphone positions for each configuration.
- Relation (correlation) between absorber properties and room acoustic parameters are analysed.



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