

ACOUSTICS2008/2514 Uncertainty in building acoustics

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In many countries, legal requirements exist with respect to the acoustical performance of buildings and building elements. Therefore information about the uncertainty of measured or predicted building acoustic properties is urgently needed. The complexity of the problem becomes obvious taking sound reduction index R as an example: R represents the ratio of incoming and transmitted sound power of a building element. For practical reasons, the direct measurement of R is replaced by a spatiotemporally averaged sound pressure level difference in two limited rooms, adjusted by the absorption of the receiving room. In doing so, unwanted influences occur like modal effects, flanking transmission, structural power exchange between laboratory and specimen, deviation from ideal diffuse sound fields with unknown consequences etc. etc. For economic reasons, often only one sample is tested and declared 'typical' for the whole family of products without regarding their spread. As a consequence, the uncertainty most often is felt to be too large to decide about the compliance with regulations but cannot be quantified. PTB in Germany has investigated the problem for the German authorities by calculation, evaluation of Round-Robin-tests und large measurement series in model houses. The results are presented in the talk.