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COMMENTS ON DR PARMANEN'S LETTER TO THE EDITOR, "COMMENTS AND CONCLUSIONS BASED ON 'ALTERNATIVE REFERENCE CURVES FOR EVALUATION OF THE IMPACT SOUND INSULATION BETWEEN DWELLINGS' "

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In his Letter to the Editor Dr Parmanen is very critical of a 13 year old paper of Dr Bodlund and of the rating of sound insulation within CEN/ISO. As Dr Bodlund is no longer working within the field of building acoustics at the Swedish National Testing and Research Institute he has asked us, as former colleagues and as former convener (H. G. Jonasson) of the relevant ISO working group, to comment on Dr Parmanen's letter.

We are not prepared to go into technical details but we would like to give the background to the work carried out by ISO. The work was carried out by ISO TC 43/SC 2/WG 21 which, however, relied upon the results of the parallel European working group CEN TC 126/WG 4 under the convenership of Professor J. Lang from Austria. As the work was considered to be very important, most European countries were represented by very qualified and experienced acousticians. One of them was Professor Fasold, to whom Dr Parmanen often refers. There was consensus on all decisions taken. In the final voting for ISO 717 the only negative vote came from Finland, which was not represented in any of the working groups. Everybody in the working groups was, however, informed about the Finnish comments.

As to the adaptation term for impact sound it is true that it is partly based on Bodlund's work, but it is equally true that it is based on other works carried out in the Netherlands, Germany, France and other countries. Bodlund was not alone in his general conclusions. Actually the adaptation term introduced in EN ISO 717/2 is of Dutch (not Swedish!) origin. Although the general opinion of the members of the working groups was that the adaptation term was a step in the right direction everybody also recognized the fact that the adaptation term was not the perfect solution. Thus it was decided to put the term in an informative and not in a normative annex. The idea is to gain more experience before we introduce a normative adaptation term.

The adaptation term will, of course, not solve all problems with impact sound rating but the possibility to expand the frequency range is interesting. Low frequency sound (below 100 Hz) is one main candidate to explain the shortcomings of the rating L'_{nw} that is evaluated in the range 100–3150 Hz only. With lightweight timber joist floor constructions, including the range 50–100 Hz, the spectrum adaptation term may change dramatically. $C_{I,50-2500}$ may be as much as 10–12 dB higher than $C_{I,100-2500}$. This has been proved in a study from the Nordic Committee on Building Regulations (NKB), Report 1996:02 (Klas Hagberg) ISBN 951-53-0781-3 (in Swedish).

However, another finding of practical interest is important to mention. Since the spectrum adaptation term of the new EN ISO 717 was applied in a new Swedish standard for classification of sound climate in dwellings, there has been evidence that there is a need for restrictions on both high frequency footfall noise as well as low frequency noise. The spectrum adaptation term $C_{I,50-2500}$ may be negative for certain semi-soft floor coverings on

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massive slab floors, as much as -10 dB may occur. The current proposal for a new internordic standard (INSTA-B Draft 122) for classification of sound climate in dwellings (where J. Parmanen is a co-author) therefore prescribes that the $C_{I,50-2500} \geqslant 0$ for this reason, i.e. both $L'_{n,w}$ and $L'_{n,w} + C_{I,50-2500}$ must fulfill the stated requirements. There seems to exist a wide variety of impact sound spectra (inherent in different constructions and floor coverings) which indicates that it may be hard to find one weighting that treats all possible cases that may occur in practice equally well.

As to the adaptation terms for airborne sound the background was different. Several countries had used the terms, although in slightly different forms, for many years. Thus it was logical to include these terms as mandatory parts of EN ISO 717/1.

To summarize, the solutions given in EN ISO 717 parts 1 and 2 have been obtained through consensus and compromises in the working groups and they have received overwhelming support from the member countries of ISO and CEN. The standards work well and the introduction of adaptation terms will create new experiences which later on are likely to contribute to even better standards for rating of sound insulation. We have difficulties in understanding how these standards can create "chaos in international sound insulation ratings".