

# LIMITING ANNOYING NOISE IN OPEN-PLAN OFFICES

*Claus Møller Petersen*

Grontmij|Carl Bro  
Acoustica – department  
Granskoven 8 – DK 2600 Glostrup, Denmark  
cmp@gmcb.dk

## 1. INTRODUCTION

A number of open-plan offices have been investigated on acoustic, working environment and architectural matters, as a part of an intervention-project supported by the Danish Working Environment Research Fund. One of the project's purposes is to find better acoustic descriptors than the existing rules on minimum absorbing areas from the Danish Working Environment Authority.

## 2. MAIN FINDINGS

Acoustic measurements shows that nearly all the offices meets the requirement on minimum absorbing areas ( $0,9 \times$  Floor area), but from the questionnaires in the same offices a certain dissatisfaction with the general acoustic conditions is found. The investigations showed that in more offices arrangement and architecture were inappropriate. Especially you found many mixed work-functions - where noisy and noise-sensitive workplaces were places close to each other - as well as workplaces with a lot of passing walk-traffic. Other workplaces had limited daylight. On the other hand speech is also evaluated as positive concerning sharing knowledge and social life in the offices.

Two types of detailed acoustical measurements and computer simulations with the ODEON software package was made, concerning:

- Sound transmission between different workplaces (parameters as DL2 og DLf from ISO 3382-3)
- Local acoustics on the individual workplaces

As well the sound transmission as the local acoustics showed up to vary surprisingly much. For transmission at same distances the typical size of variations was approximately from +8 dB to -4 dB (re. free field), i.e. the offices mostly amplifies the sound compared to free field conditions, see fig. 1.

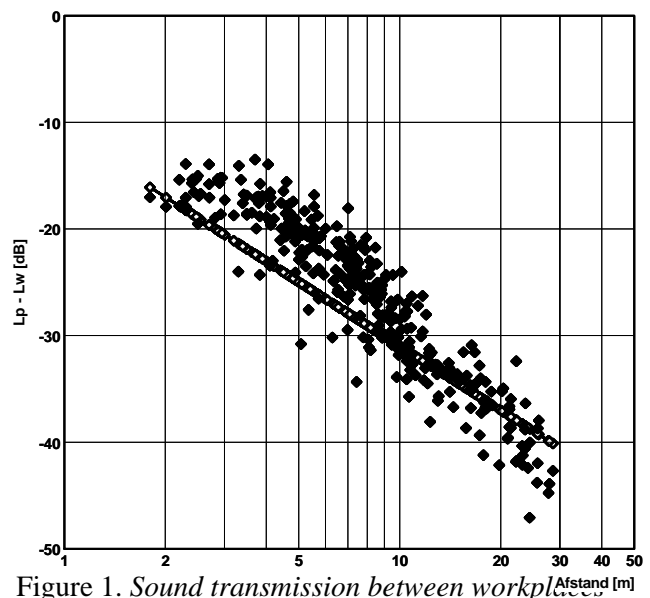


Figure 1. Sound transmission between workplaces

## 3. NEW PARAMETERS

Trying to find new acoustic descriptors with good correlation with the experienced local acoustics on individual workplaces we are investigating parameters of the types known from stage acoustics. Preliminary results typically show variations within an interval of 10 dB, and with a few outliers up to 15 dB.

## 4. FUTURE WORK

The next phase of the project is the intervention, where the practical rebuilding in the offices takes place. The intervention project is based on both acoustical, working environment and architectural analyses. The expected acoustical results are optimized by means of computer simulations. In the final phase of the project (start of 2009) the measurements and questionnaires are repeated and the results are used to establish optimum intervals for the acoustical parameters.