

No.: 0055 Noise prediction for new production facilities

○ Problem

When planning new production facilities, special attention should be accorded to the expected noise exposure in order to protect the workers against its hazardous effects. There are advantages to considering suitable noise reduction measures early on in the planning phase. In contrast to existing production facilities, where the potential hazards of noise to workers can be measured in terms of the sound level at various workplaces, a noise prediction needs to be made for new production facilities. This then allows for a targeted and cost-effective plan for noise reduction.

A woodworking facility planned to move all of its production facilities into a new building complex. The anticipated hazards to the employees arising from noise in the new facilities were to be determined by a noise prediction in order to allow the inclusion of suitable noise reduction measures into the planning of the new building.

○ Activities

The sound level of 136 noise sources that were to be housed in the new complex were determined in part by referring to the manufacturer specification and in part by measurements taken at the existing facilities.

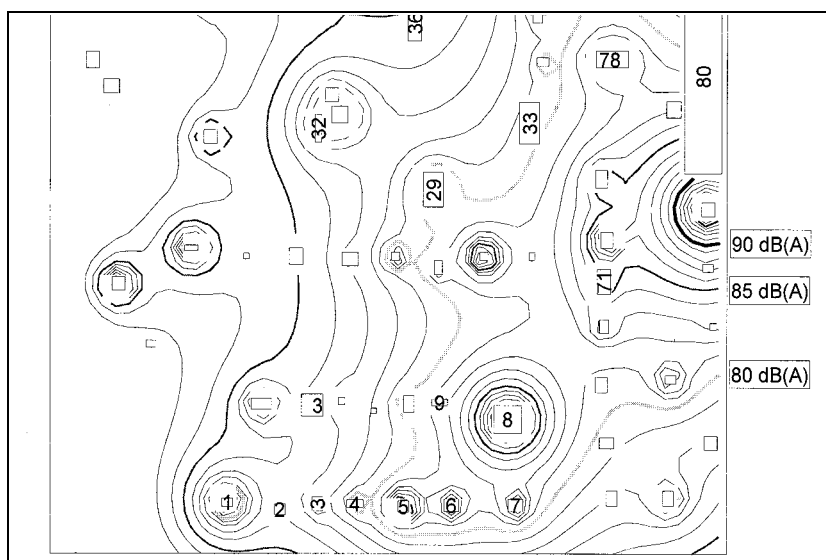


Illustration
Image of the
calculated sound
level distribution
for forecasting the
noise levels in a
production facility.
(Excerpt)

The operation times of the individual machines were provided by the proprietor on the basis of multiple instantaneous measurements. Using this data and the machine operation schedules, the sound level distribution for the new building complex was calculated by a computer program conforming to VDI 3760. In order to test the effects of acoustic noise-reducing measures in the rooms, several variants of the acoustic design were calculated for each room.

○ **Results and Application**

The noise prediction showed that a noise hazard in the range between 85dB(A) and 90dB(A) was to be expected in open spaces if no noise reducing measures were undertaken in any of the production rooms. Installing a noise absorbing ceiling resulted in calculations with considerable reductions of the noise zones – to the extent that the noise hazards could be localised to a small number of noisy machines. The calculated sound levels indicated that additional noise-reducing measures at the machines could eliminate the noise hazards for all the workplaces.

○ **Area of Application**

All production facilities.

○ **Additional Information**

- VDI 3760: Berechnung und Messung der Schallausbreitung in Arbeitsräumen (02.96). Beuth, Berlin 1996
- Maue, J.H.: Erfahrungen mit Lärmprognosen für Arbeitsräume unter Anwendung der VDI-Richtlinie 3760. Sicherheitsingenieur (1998) Nr. 10, S. 16-20 und (1998) Nr. 11, S. 22-24
- Maue, J. H.: Geräuschimmissionsprognosen im Rahmen von Lärminderungs-Betriebsberatungen. Sichere Arbeit (2002) Nr. 6, S. 24-28

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