# THE SPECTRUM SHAPE OF OUTDOOR AND INDOOR ROAD TRAFFIC NOISE

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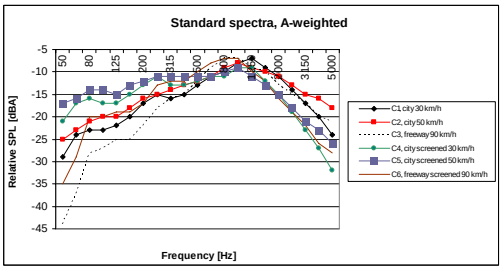
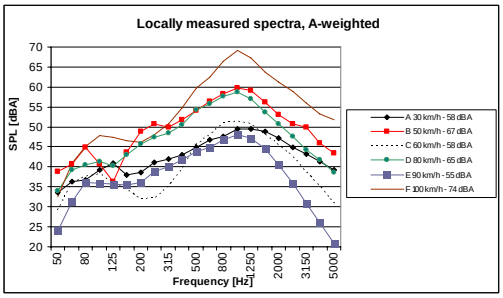
## Problem:

There is always a peak between 50 - 100 Hz in the road traffic noise spectrum. To investigate the effect of the peak on the façade transmission loss between outdoor and indoor road traffic noise, façade transmission loss has been calculated with A; the standard spectra from the official Norwegian calculation method and B; locally measured traffic noise spectra.

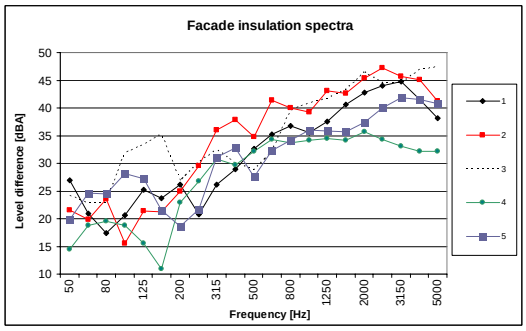



A: The standard spectra from the official Norwegian calculation method




B: The locally measured traffic noise spectra used for comparison

Measurement position for spectre A.




The façade insulation spectra used

Measurement position for spectre F.

Calculation method:

$$L_{in\,f} = L_{rn\,f} - D$$

Where

- $L_{in\,f}$ is indoor noise
- $L_{rn\,f}$ is outdoor road traffic noise and
- D is level difference

$L_{in\,f}$ is calculated for each ⅓ octave band between 50-5000 Hz and then summed to a single dB value.

The calculations show that standard spectra can overestimate façade transmission loss with as much as 4.7 dB or underestimate the façade transmission loss with 3.7 dB. The calculated difference is > 3 dB in 17 % of the cases.



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