

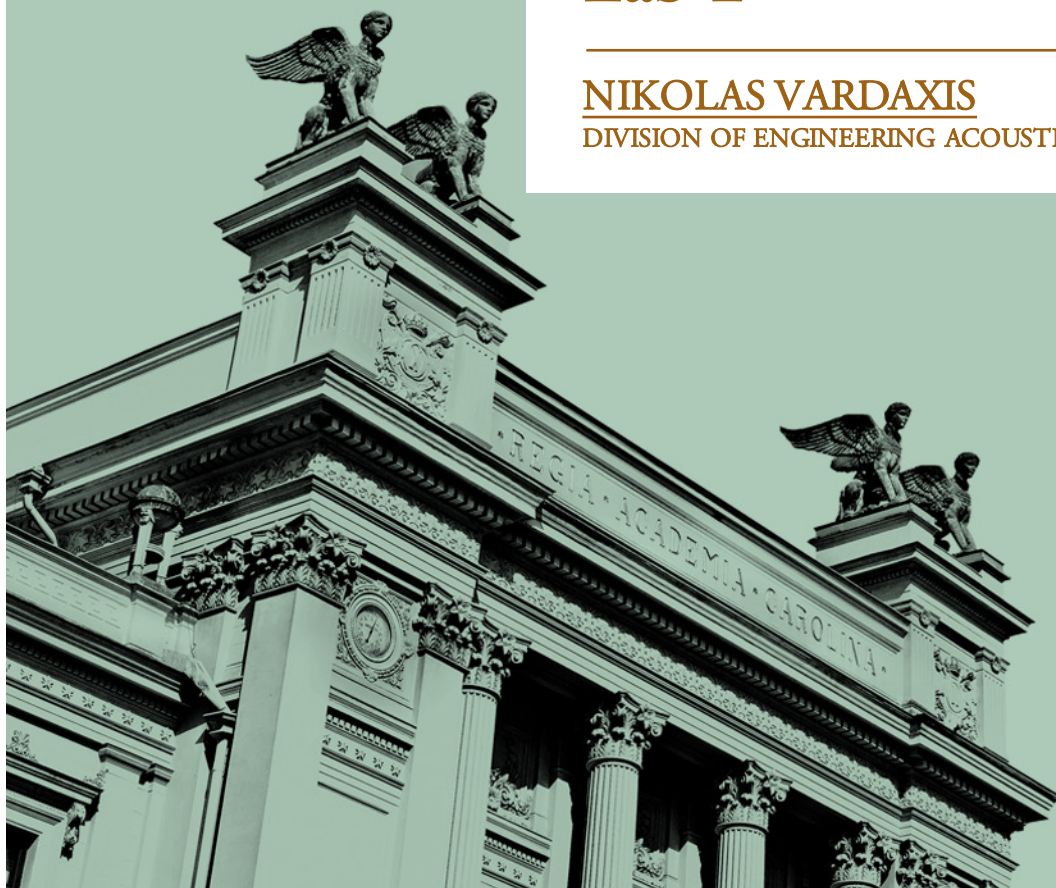


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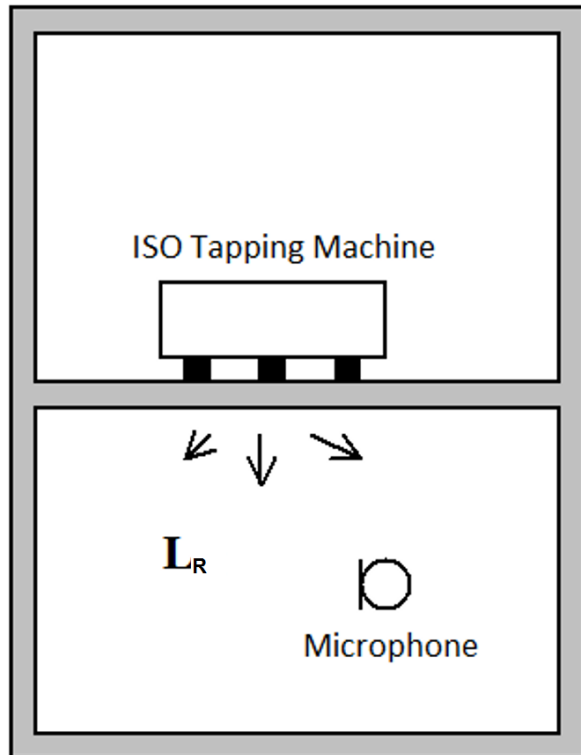
Ljud i byggnad och samhälle (VTAF01) – Lab 2

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Measurement impact sound insulation (I)



Impact sound level:

$$L_n(f) = L_R(f) + 10 \log \left(\frac{A(f)}{10} \right)$$

$L_n(f)$: normalised impact sound level [dB]

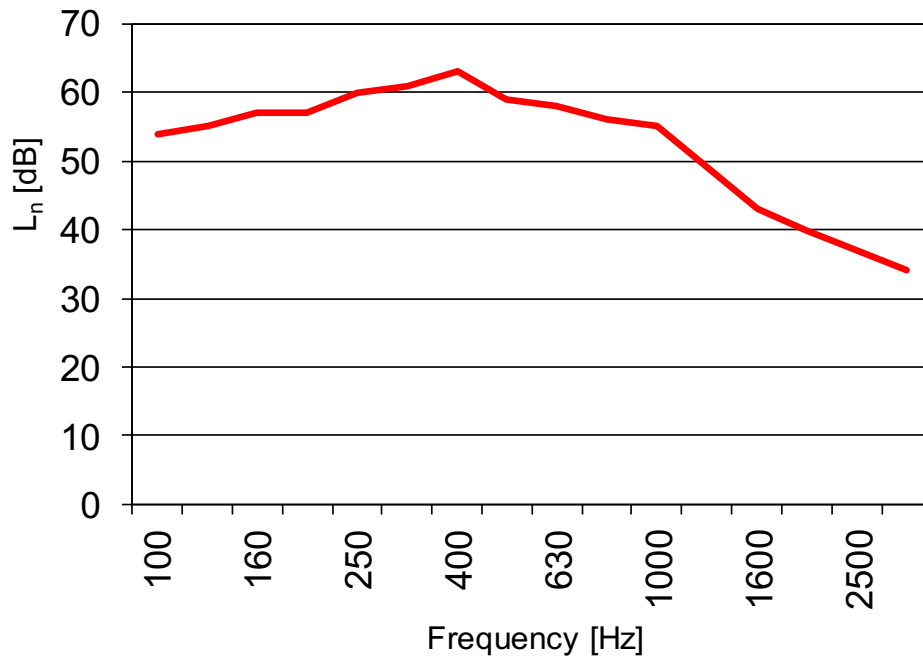
$L_R(f)$: SPL in the receiving room [dB]

$A(f)$: absorption area in the receiving room



Measurement impact sound insulation (II)

- Example of measured curve:
 - High values $\Rightarrow$ Higher sound transmission $\Rightarrow$ "Noisier"

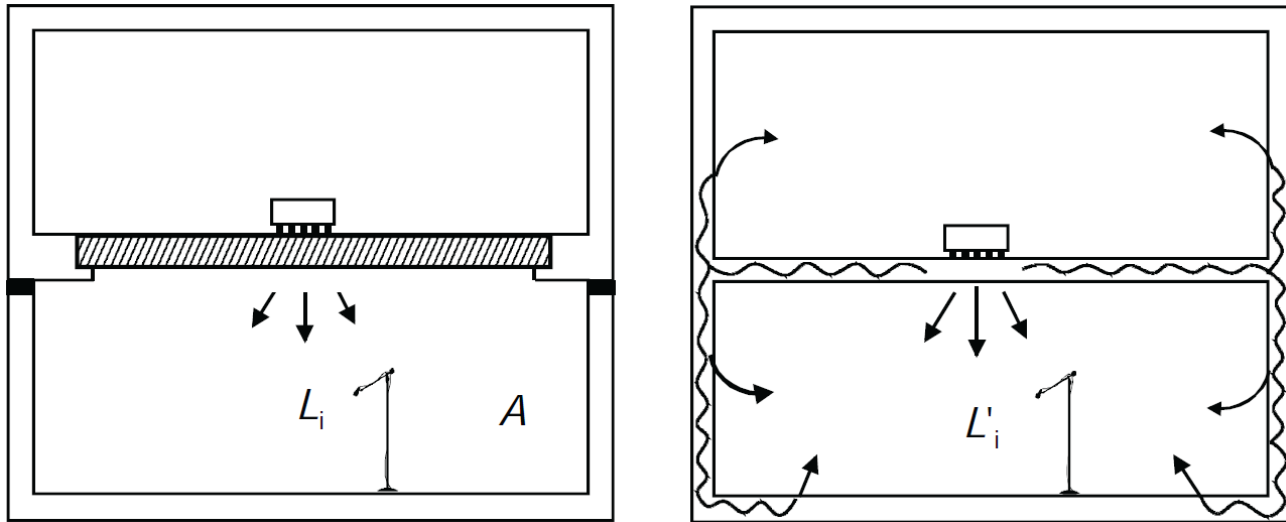


ISO 717-2 $\rightarrow L_{n,w} (C_{l,50-2500})$



Remember...

... Laboratory vs. Field situation (flanking transmission comes into play)



[REF] T.E. Vigran, Building Acoustics, CRC Press 2008.

Check: Chapter 6: Sound transmission.
Characterization and properties of single walls and floors



Step sound lab



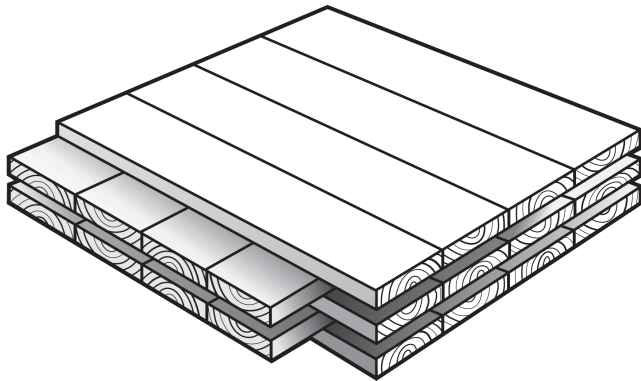
Sending room
 $5.1 \times 5.8 \times 2.7 \text{ m}^3$



Receiving room
 $5.1 \times 5.8 \times 3.2 \text{ m}^3$



Floor under study



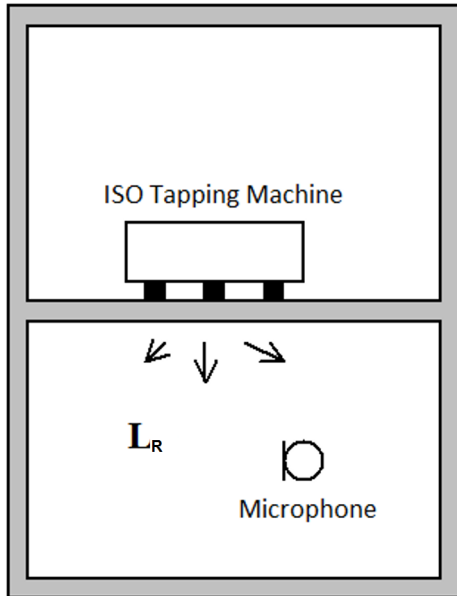
Cross-laminated timber (CLT)



4x3 m² / 180mm-thick CLT floor



Procedure



1. Measurement $T_{60}(f)$ in the receiving room $\rightarrow A(f)$
 - a. Impulse method
 - b. Interrupted noise method

NOTE: 2 source positions / 2 measurements per position

2. Measurement (~ 15 sec) of $L_R(f)$
 - a. 4 tapping machine positions
 - b. 2 measurements for each tapping machine position

Impact sound level:

$$L_n(f) = \overline{L_R(f)} + 10 \log \left(\frac{\overline{A(f)}}{10} \right)$$

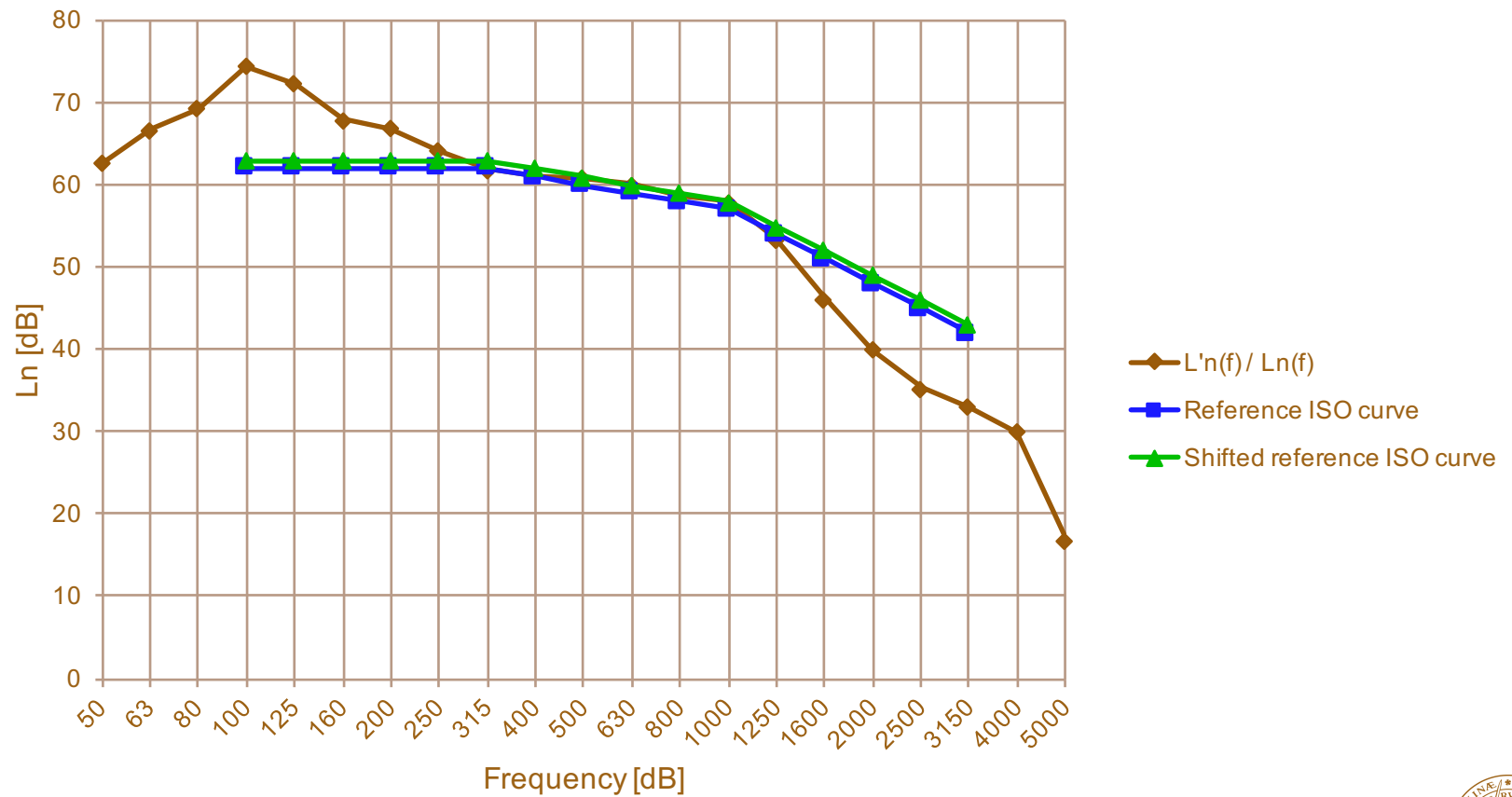
Energetic
average

$$\overline{L_R(f)} = 10 \log \left(\frac{1}{n} \sum_{i=1}^n 10^{\frac{L_{p,i}}{10}} \right)$$

$$\overline{A(f)} = 0.16 \frac{V}{\frac{1}{n} \sum_i T_{60,i}}$$



Results



Thank you for your attention!

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