INSUL

Software for sound insulation and impact noise predictions

INSUL is software for sound insulation and impact noise predictions. The software calculates the sound insulation performance of:

- Single walls
- Double walls with many different stud types
- Floors with- or without suspended ceilings. Many different types of connections.
- Two-pane windows

The predictions are based on analytical calculations that only need simple data for the design. The software calculates the sound reduction in third-octave bands and the weighted sound reduction indices, R_w, $R_w+C_{50-3150}$ and $R_{Atr.}$

The Impact noise, $L_{n,w}+C_{50-2500}$, is predicted for heavy floors with- or without suspended ceiling and flooring.

INSUL can be used to quickly evaluate new materials and systems, or to investigate the effects of changes to existing designs. It models materials using well known elastic plate theory including allowances for thick panel effects as published by Ljunggren, Rindel and others. More complex partitions are modelled using work by Sharp, Cremer and others.
The software can handle the effect of different absorption material in the cavity. Different stud types can be predicted, i. e. wooden studs, steel studs, separated and staggered studs, resilient rail, point connections, rubber isolation clips.

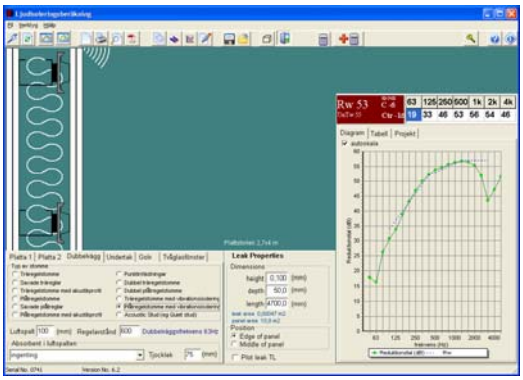
Ceilings with different types of connections, for instance suspended point connections can be handled. The sound insulation of two-pane windows is predicted with a theory different from the double wall theory. Different glass types can be handled.

INSUL has evolved over several versions over more than 10 years into an easy to use tool and has refined the theoretical models by continued comparison with laboratory tests to provide good accuracy for a wide range of constructions.

In a Swedish research project comparisons were made between **INSUL** predictions and measurement results from 12 different labs. The conclusion is that **INSUL** can predict R_w with a mean error of ca 0,5 dB.

INSUL takes account of finite size effects which are very important when predicting small samples such as windows and also for normal elements at low frequencies.

INSUL will greatly enhance the ability of acoustic consultants and product manufacturers to quickly and confidently specify constructions in order to achieve the desired sound insulation.



- Verified calculation algorithms
- Data base with common material
- Database with floorings
- The databases are open for editing and adding new material
- The results can be exported to Excel, Word or Bastian.
- Composite transmission loss calculator
- Effect of leakage can be estimated

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