

MARSHALL DAY ACOUSTICS

INSUL Version 6.4

INSUL is a program for predicting the sound insulation of walls, floors, ceilings, roofs and windows. New for version 6.4 is the ability to predict complex panels such as Kingspan or Paroc. Insul uses robust theoretical models that are quick to calculate and only require easily obtainable construction information.

The program can make good estimates of the *Transmission Loss (TL)*, *Weighted Sound Reduction Index (Rw or STC)* and *Impact Sound Insulation (Ln,w/IIC)*. INSUL takes account of finite size effects which are especially important when predicting small samples such as windows. Like any prediction tool INSUL is not a substitute for measurement. However, extensive comparisons with test data indicate that INSUL reliably predicts *Rw/STC* values to within 3dB for most constructions. And *IIC/Ln,w* values to within 5 dB.

INSUL can be used to predict new constructions or to evaluate new materials, or to investigate the effects of changes to existing designs. It can model masonry or light weight partitions and has evolved over several versions into a very easy to use tool that has been refined by continual comparison with laboratory tests to provide accuracy for a wide range of constructions.

Features

- Database of common builderswork materials and floor coverings
- Material parameters are user definable
- Composite Transmission Loss calculator
- Leakage calculation
- Prediction of rain noise
- Prediction of triple glazing window
- Standalone or network license available.
- Languages selectable: English, French, German, Spanish, Polish
- Calculation range 50– 5000 Hz
- Absorption materials user definable
- English or Metric units
- Indoor to Outdoor calculator
- Export to BASTIAN

New Features in v6.4

IMPACT SOUND FOR LIGHT WEIGHT FLOORS

INSUL can now predict the impact sound insulation of light weight floors. This is a very significant development from previous versions of INSUL which were capable of predicting impact sound insulation for massive floors such as concrete.

Impact sound insulation predictions can now be carried out for different joist constructions including timber joists and ZGirts. The prediction routines are sensitive to the dimensions of the joists, their mass and spacing and all of these variables can be set independently in INSUL. A range of floor linings is available including plywood, particle board, orientated strand board (OSB) and thin timber floor boards.

As with previous versions of INSUL, ceilings can also be included in the predictions, with a range of ceiling connections including directing fixing to the joists, rubber isolation clips and separate ceiling joists. INSUL also includes the option to add infill material in the cavity of the construction.

SOUND INSULATION OF SANDWICH PANELS

INSUL can now predict the sound insulation of a variety of light weight sandwich panels. A typical example would be panels with thin steel or aluminium skins, with a polystyrene or mineral wool core. For instance panels from Kingspan or Paroc. The sound insulation both of single panels and panels used in more complex constructions can be predicted. The properties of the core can be adjusted using the in built materials properties editor.

In addition sandwich panels with much stiffer cores can also be predicted, a typical example would be a panel with steel facings and a light weight aerated concrete (Speed-wall).

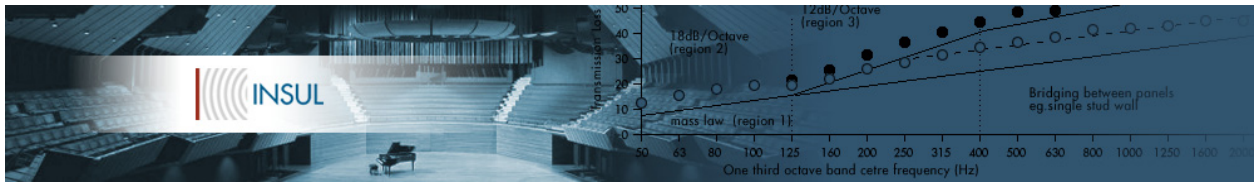
TRAPEZOIDAL PROFILED METAL PANELS

INSUL has improved the prediction of profiled metal panels, typically used for commercial and industrial buildings. Previously only single panels could be predicted, and not complex constructions using corrugated or profiled panels. New routines based on the work of Lam and Windle in England allow more accurate prediction of particular profiles, and of constructions using profiled panels in conjunction with flat sheets and in cavity constructions as well. For instance the effect of a layer of plywood underneath a profiled steel skin can be predicted. Then this can be extended by adding an airgap and a second lining, with or without an acoustic blanket in the cavity.

POROUS BLANKETS AND FACINGS

INSUL can now predict the sound transmission loss of porous blankets either alone or as a facing for a construction. Typical constructions would include modular panels for acoustic enclosures that have a steel skin with a mineral wool infill and perforated steel internal facing.

More information: www.rahe-kraft.de



Example

Input for panel 1

Panel 1 | Panel 2 | Wall | Ceiling | Floor | Double Glazing

Material: **Beton** v.2

Thickness: **100** (mm) Number of Linings: **1**

Surface Mass 234,0 kg/m² Critical Freq 299,1 Hz

Profile: Flat Corrugations Ribs

Outer layer | Inner layer

100 mm concrete, 1 x 12,5 mm gypsum

Input for panel 2

Panel 1 | Panel 2 | Wall | Ceiling | Floor | Double Glazing

Material: **Gipskartonplatte** v.2

Thickness: **12,5** (mm) Number of Linings: **2**

Surface Mass 17,3 kg/m² Critical Freq 3038 Hz

Outer layer | Inner layer

18 mm fibre board, 2 x 12,5 mm gypsum

Input panel connection

Panel 1 | Panel 2 | Wall | Ceiling | Floor | Double Glazing

Frame type:

- Timber stud
- Staggered stud
- Timber stud + resil. rail/bar
- Steel stud
- Staggered Steel stud
- Steel stud + resil. rail
- Point connections
- Double timber stud
- Double steel stud
- Rubber Isolation Clip timber stud
- Rubber Isolation Clip Steel stud
- Acoustic stud

Airgap: **100** (mm) Stud spacing: **600** Mass-air-mass **66**Hz

Cavity Absorption: Steinwolle (33kg/m³) Thickness: **100** (mm)

Rubber isolation clip on timber stud

Prices

Single user licences:

| | |
|---|-----------|
| Base price (Licence 1): | 1.100,- € |
| Discount for additional licences on request | |
| Update from v6.2 to v6.4 | 440,- € |
| Update from v6.3 to v6.4 | 275,- € |

Network licences:

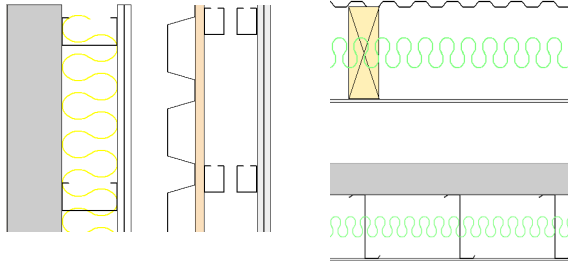
| | |
|--------------------------------------|-----------|
| LAN-Network | |
| Base price (1 st Licence) | 1.650,- € |
| further licences | 300,- € |
| Update from v6.2 to v6.4 | 660,- € |
| Update from v6.3 to v6.4 | 413,- € |

| | |
|--------------------------------------|-----------|
| WAN-Network | |
| Base price (1 st Licence) | 2.530,- € |
| further licences | 300,- € |

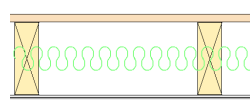
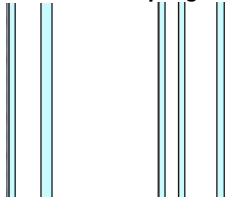
Demo and time-limited trial licences available on our webpage.

Further features

Several connection models



Double and triple glazing



Predictions of glazing, floors, ceilings, roofs, walls

Please contact us for more information:

Rahe • Kraft

Akustikbüro Rahe-Kraft GmbH
 Monumentenstr. 33/34
 D-10829 Berlin
 Germany
 www.rahe-kraft.de

Your contact person:

Tobias Kirchner
 t.kirchner@rahe-kraft.de
 Fon: +49.30.263 93 69-21
 Fax: +49.30.263 93 69-20