

# INSUL

Version 6.4

For predicting the airborne sound insulation of walls, floors and glazing, impact sound insulation of floors and rain noise



MARSHALL DAY ACOUSTICS

This software was developed by Marshall Day Acoustics. It was developed to automate the repetitive calculations associated with the prediction of the sound insulation of those constructions commonly encountered in Building Acoustics.

Over 1000 licences have been sold in over 30 countries over the last 10 years. It is used by consultants, builders, material and component manufacturers and Universities.

Marshall Day is an independent acoustical consulting firm. The firm is located in New Zealand, and Australia with offices in Auckland, Wellington, Christchurch, Melbourne and Sydney.

## Auckland Office

84 Symonds St  
PO Box 5811  
Wellesley St,  
Auckland  
NEW ZEALAND

Tel +64 (0) 9 379 7822  
Fax: +64 (0) 9 309 3540

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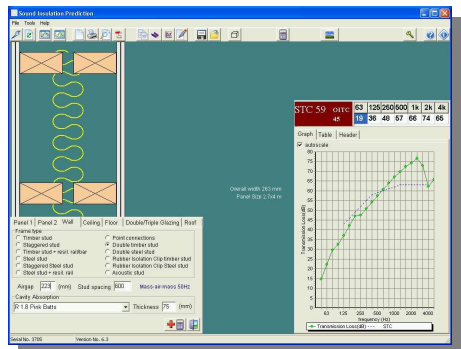
Distributor in USA, Canada and Mexico  
Navcon Engineering  
701 W. Las Palmas Drive  
Fullerton CA 92835 USA  
Tel: (+1) 714-441-3488

## Sound Insulation Prediction

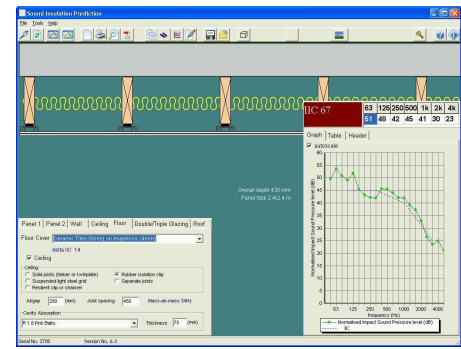
### CAPABILITIES:

- predicts airborne sound insulation performance of walls, floors, and windows. **New** includes sandwich panels like Kingspan and Paroc
- predicts impact sound insulation of concrete floors with different floor coverings **New** can now predict light weight and timber floors
- **New** Improved prediction of profiled metal sheets including complex double skin constructions
- **New** Can now predict transmission loss of porous blankets, alone or as facings to partitions or panels
- accurate estimates of Transmission Loss (TL), Weighted Sound Reduction Index ( $R_w$  or STC), Sound level Difference ( $D_{nTW}$ ) including C and  $C_{tr}$  corrections and impact sound pressure level ( $L_{n,w}$  or IIC)

INSUL is a program for predicting the sound program can make good estimates of the insulation of walls, floors, ceilings, roofs and Transmission Loss (TL), Weighted Sound windows. New for version 6.4 is the ability to Reduction Index ( $R_w$  or STC) and Impact predict complex panels such as Kingspan or Sound Insulation ( $L_{n,w}$ /IIC). Paroc. Insul uses robust theoretical models that INSUL takes account of finite size effects are quick to calculate and only require easily which are especially important when obtainable construction information. The 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  $R_w$ /STC values to within 3dB for most constructions. And IIC/ $L_{n,w}$  values to within 5 dB.

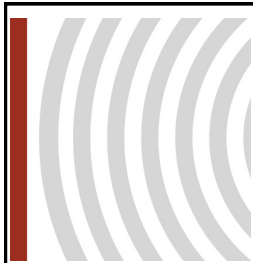


INSUL can be used to predict new constructions or to evaluate new materials, or to investigate the effects of changes to existing designs. It can model masonry or light weight partitions and has evolved over several versions into a very easy to use tool that has been refined by continual comparison with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



### INSUL - Features

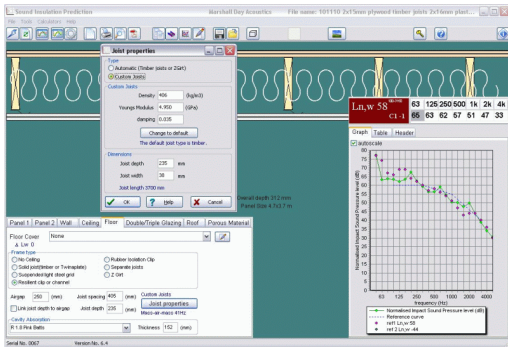
- Database of common builderswork materials and floor coverings
- Material parameters are user definable
- Composite Transmission Loss calculator
- Leakage calculation
- Standalone or network license available.
- Languages selectable: English, French, German, Spanish, Polish
- Calculation range 50– 5000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



# INSUL

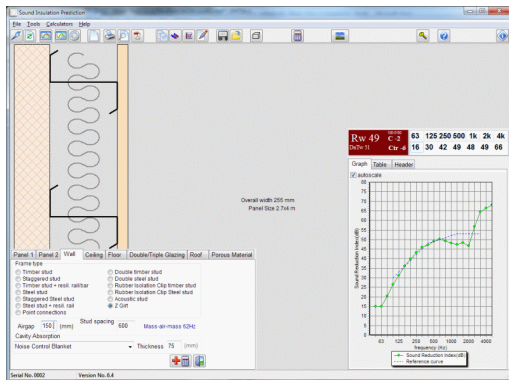
*For predicting the airborne sound insulation of walls, floors and glazing and impact sound insulation of concrete floors*

## New Features in version 6.4



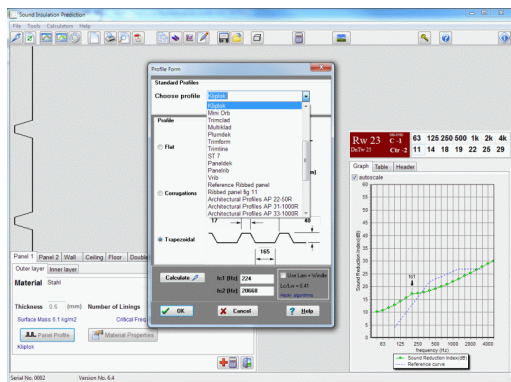
### Impact Sound Insulation for Light Weight Floors

INSUL can now predict the impact sound insulation of light weight floors. This is an evolution of 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 (for example Speedwall).



### Trapezoidal and 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