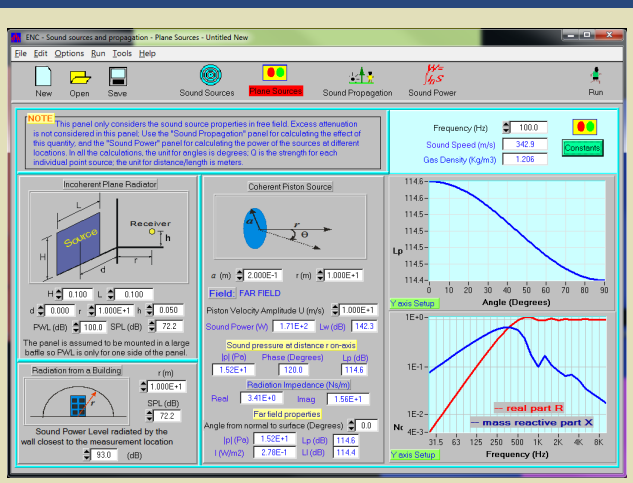
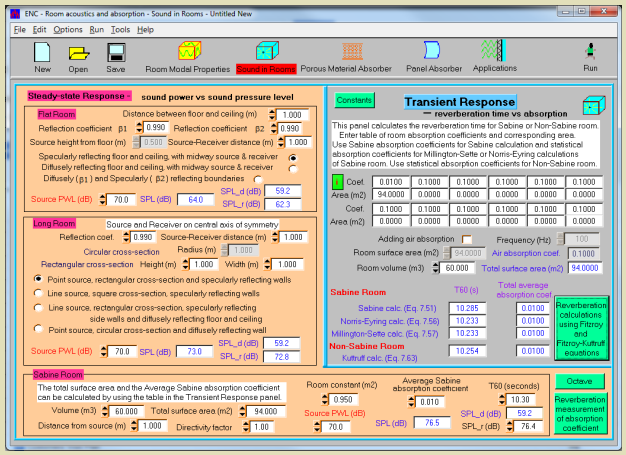
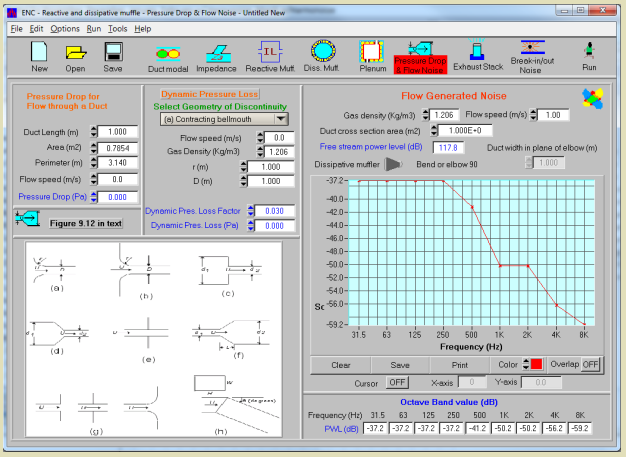
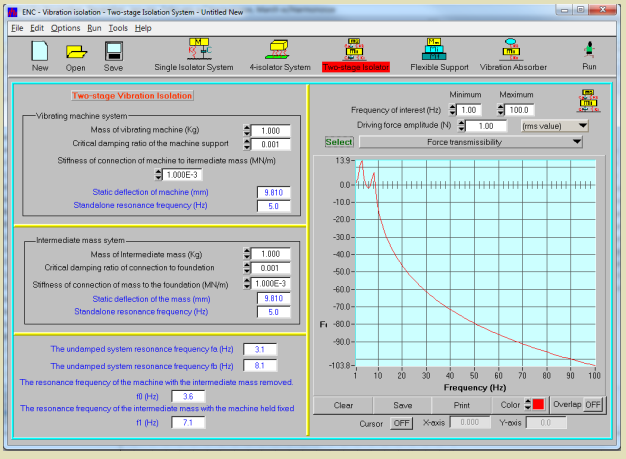
ENC
Engineering Noise Control Calculation Software









No longer is it necessary to do tedious and risky hand calculations. All of the calculation procedures in the book, Engineering Noise Control, by D.A. Bies and C.H. Hansen have been verified and encapsulated in a windows graphical user interface which is extraordinarily simple to use and provides results in tabular and graphical form. The calculation procedures have been thoroughly tested and checked and are highly reliable.

A useful feature is the ability to run an analysis several times and plot the results for each run on the same axes to explore the effect of changing various input parameters and to allow a design goal to be achieved quickly. Targeted users are mechanical engineers, noise and vibration consultants and students undertaking noise control courses. although anyone interested in noise control or who has a noise problem would benefit. The software is divided into seven modules, corresponding to various sections of the text book.

ENC is developed by Causal Systems. The user manual and demo version can be downloaded free-of-charge from www.scantekinc.com.

For inquires about ENC in North America, please contact:

Scantek, Inc.
www.ScantekInc.com

version 121530

Detailed Software Contents - Modules 1-7

Module 1
Fundamentals, subjective response to sound and noise criteria (chapters 1,2,3 and 4)

- calculation of speed of sound in liquids, solids and gasses
- sound power from sound power level and vice versa
- sound pressure from sound pressure level and vice versa
- sound intensity from sound intensity level and vice versa
- addition/subtraction of coherent sound levels
- addition/subtraction of incoherent sound levels
- combining noise reductions where several paths from source to receiver are involved
- loudness in phons and sones given in octave or 1/3 octave band levels
- calculation of NC, NR, NCB, and RC (as well as spectral character) from octave band data
- A-weighted sound levels from octave or 1/3 octave band linear levels
- allowed exposure time (European, USA criteria)
- daily noise dose from dB(A) noise levels and time of exposure to each level
- hearing damage risk calculations usint ISO 1999 and Bies/Hanson methods
- impact noise dose calculations
- speech interference calculations

Module 2
Sound power of sources and outdoor sound propagation (chapters 5 & 6)

- sound pressure at specified distance due to monopoles, dipoles, quadrupoles, line sources (coherent and incoherent) and plane sources, given the source sound power or source strenth. Reverse calculations are also available.
- outdoor sound propagation - OCMA, CONCAWE, and exact analysis, meteorological effects, ground effects (3 procedures), air absorption radiation field of a source (indicates whether observer is in near field, geometric, near field, far field or a transition region)
- sound power from reverberant room measurements
- sound power from field measurements, semi-reververant field (3 methods), near field measurements, (3 methods),
- vibration measurements

Module 3
Room acoustics and sound absorption (chapter 7, Appendices 3, 4 and 5)

- resonance frequency, modal density, modal overlap for rectangular rooms room absorption (and room constant) from reverberation time and vice versa (Sabine and Millington-Sette)
- room sound pressure levels from sound power of source in room and vice versa, Sabine rooms, flat rooms (specularly and diffusely reflective walls)
- calculation of statistical absorption coefficient averaged over room from data for individual room surfaces
- calculation of statistical absorption coefficient from material flow resistivity and thickness for:
  - porous material layer,
  - porous materials layer with impervious skin,
  - porous materials layer and perforated sheet of just perforated facing
- design of panel sound absorbers given desired absorption coefficients
- empirical method
- analytical method
- calculation of effect on sound levels in a room of adding a specified amount of absorbing material
- determination of optimum reververation times for specified space size and use

Module 4
Transmission loss, enclosure design, barriers (indoor and outdoor) and pipe wrappings (chapter 8)

- TL calculations for single partitions (both Sharpe and Davy/Hansen
- methods), STC calculations, isotropic panels, ribbed panels
- TL calculations for double partitions (Sharpe and Davy methods), STC calculations, steel or wooden studs
- Calculation of overall TL for a wall with windows, doors, cracks etc.
- Enclosure noise reduction calculations. Includes cooling air flow requirements, effect of cracks and openings and effect of enlosure internal conditions
- Outdoor barrier noise reduction. Includes diffraction around sides and top, ground absorption and barrier thickness included, point or line sources, wind and temperature gradient effects included
- Indoor barrier noise reduction, barrier of arbitrary orientation in a rectangular room
- Pipe lagging noise reduction (2 calculation methods)

Module 5
Dissipative and reactive muffler design and duct breakout noise calculations (chapter 9)

- impedance of orifices, expansion chambers and ducts (resistive and reactive)
- Helmholtz resonator design and noise reduction
- Expansion chamber noise reduction
- Low pass filter (for reciprocating compressors etc.) design and noise reduction small engine exhaust design
  pressure drop estimates for specified dissipative or reactive mufflers
  flow generated noise due to silencers and duct bends
- Dissipative muffler design, lined duct attenuation calculations for sound absorptive liners with and without impervious and perforated facings, noise reduction due to reflection at inlet adn outlet, correction due to effective expansion in line section
- duct breakout and break-in noise calculations
- Lined plenum chamber noise reduction calculations
- Exhaust stack directivity and noise reduction vs height calculations

Module 6
Vibration Isolation and Damping (chapter 10)

- mass on spring isolator resonance frequency for damped and undamped systems, frequency of maximum displacement, velocity and acceleration. Force trasmissibility as a function of excitation frequency, resonance frequency and damping effect of flexibility in the foundation or mounted mass on the transmitted force
- machine mounted on 4 isolators, resonance frequecies calculations
- vibration absorber design, optimum stiffness and damping for specified mass ratio, vibration amplitude and absorber at resonance
- relation between different damping measures (critical damping ratio, loss factor, logarithmic decrement

Module 7
Sound power estimates for Specific source types (chapter 11)

- fans
- compressors
- cooling towers
- pumps fuid jets
- control valves
- fluid flow in pipes
- boilers
- turbines
- IC engines
- furnaces
- electric motors
- generators
- transformers
- gears