SCS-EUROACOUSTIC

SCS 902A

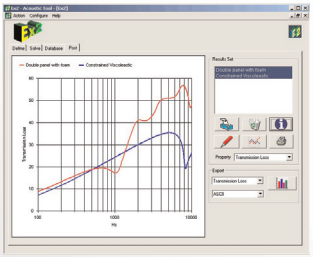
NOISE & VIBRATION CONTROL

PORO ACOUSTIC AND DAMPING CHARACTERISTICS OF ACOUSTIC MATERIALS

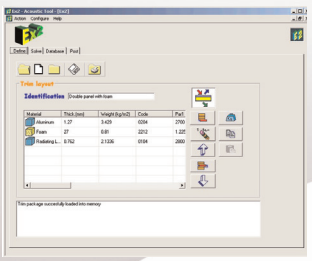
www.scs-controlsys.com

Acoustic Trims package Ex2 Prediction Software

SCS Ex2 Prediction Software is a fast and powerful tool conceived to predict the most typical acoustic parameters of multi-layered trim packages. Includes simulation of materials like: Isotropic solids, Foams, Fibers, Fluids, Impervious film, etc.
Technology has been intensively tested and validated by simulation of several acoustic tests performed by SCS 902A devices.
It has an easy and intuitive graphical interface, and a huge material databases is available for solids, porous and fluids, in which it is possibie to manage and add new material.
More than "10" trim's different layers can be defined at once, Trim layer sequence can be modified using the tools button area.
Solver includes different physical models suitable to simulate material types (limp, elastic, rigid, ...), a selection among **direct or diffused acoustic field**, Narrowband and 1/3 octave band analysis.
Computed acoustic parameters: **absorption, transmission loss, reflected and transmitted wave, surface impedance**.
Export in ASCII and Excel formats.



SCS EX2 HTL option is an additional tool for the prediction of the sound insulation property of complex trim panels, composed by a set of areas (or parts) having different compositions and different TLs as well, its acoustic performance being strongly affected by the presence of acoustic holes, seals and so on.
HTL is the right software to compute **sound insulation** capability of an effective **composite trim panel** taking into account the effect of acoustic holes.
Panel, part and holes (circular, rectangular, slit) are easily organised into an intuitive tree structure.
TL curve data can be imported by an Ex2 results file related to a package or directly defined by the user by a table. Results are TL of the panel (including the holes), TL of each area, TL of the panel (excluding the holes).



SCS 902A represent an advanced devices ensemble (hardware & software suite) for experimental determination of Materials Acoustic Properties as:

- Plane wave **Absorption coefficient** (Kundt Methods ISO 10532, ASTM E-1050)
- Acoustic **Absorption and Impedance** using classical TF method
- Acoustic Absorption using the **new T60 method** Characteristic Impedance using new T60 method
- **Transmission Loss** and Propagation constant measurement using additional tube extension and a 4 channels configuration for measurement
- **Damping Loss Factor** (Oberst method) DIN, SAE method, BS standards
- **Flow resistance** of Porous materials according to EN 29053
- **Tortuosity** parameter with electrical impedance method
- **Bulk Elastic Modulus** and Damping loss factor of porous materials
- **Acoustic insulation** between reverberant rooms (ISO 140)
- **Absorption coefficient** in Small Reverberant room (ISO 354).

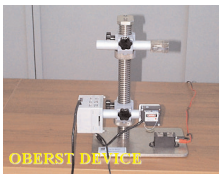
S.C.S. euroAcoustic

Acoustic Materials Properties

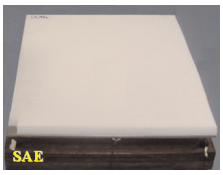
SCS 902A

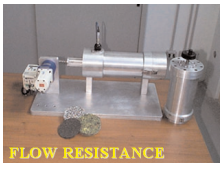
SCS 902A EXPERIMENTAL MEASUREMENT DEVICES

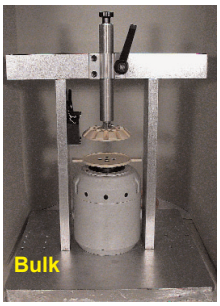
The specific devices (figures at side) have been developed to make possible the determination of one or more specific parameters of material test sample. Some of them refere to existing standards, some other refere to specific research work available.
A common way of operation for instance, is to consider the test sample of 100 mm diameter for the **Kundt device** (ISO/ASTM) and **Flow Resistance** (ISO) and use it also for determine the charactersitic impedance, in a modified Kund device, and the **Bulk modulus** (elastic modulus and damping Loss factor). In such way exactly the same sample undergo a full test series and it will be possible to compare different material composition, stratification, etc.
Oberst and **SAE** devices refere to ISO/DIN and ASTM standards, respectively, the methodology is quite similar but the sample dimensions and characteristics are different.
Alfa coefficient (Sabine) it is not directly comparable with the Kundt alfa coefficient, and normally requires a large reverberant room according to ISO 354. A specific "small cabine" is available which allow measurements comparable with large rooms in a reduced frequency range.
Transmission Loss of sample is obtainable using 2 rooms according to ISO 140 or by comparing the Acoustic power emitted from the sample holder, placed between a reverberant and anechoic rooms, using ISO 374x methods.

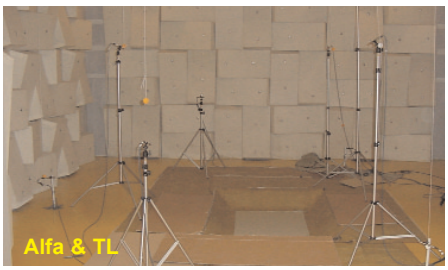


KUNDT DEVICE IS AVAILABLE IN 3 CONFIGURATION:
TF - standardized methodology based on Transfer Function using 2 microphones (ISO/ASTM);
T60 - a new method using Reverberation time measurement, better adapated for 1/3 octave data and building acosutics;
TL - measurement of the Characteristic Impedance (Z) as a straight liason with others standardized Transmission Loss measurement (example: ISO 140).
By applying proper theoretical models to the sample material, is possible to derive several parameters from 1 or more measured parameters, however, one shall take in account the error propagation and the etherogeneous characteristics of different material samples.









AVAILABLE DEVICES:

SCS 9020: Kundt tubes pair
- Plane wave absorption coefficient (Kundt Methods ISO 10532, ASTM E-1050)
- Acoustic Absorption and Impedance using classical TF method
- Acoustic Absorption using the new TR method
- Characteristic Impedance using new TR method
- Transmission Loss and Propagation constant measurement using additional tube extension and a 4 channels configuration for measurement
- Poro-Acoustic material characteristics are derived using Biot modeling (Foam) using 3 microphones method

SCS 9021/9022: Oberst & SAE
- Damping Loss Factor (Oberst method) DIN, SAE method, BS standards

SCS 9023: Flow Resistance
- Flow resistance of Porous materials according to EN 29053

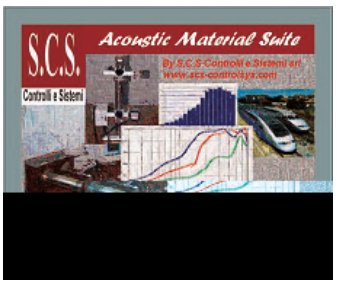
SCS 9025: Tortuosity
- Tortuosity parameter with electrical impedance method

SCS 9026: Bulk Modulus
- Bulk Elastic Modulus and Damping loss factor of porous materials

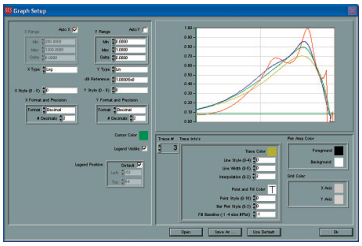
SCS 902A/S: Alfa & TL
- Acoustic insulation between reverberant rooms (ISO 140)
- Absorption coefficient in Small Reverberant room (ISO 354).

SCS 902A EXPERIMENTAL SOFTWARE

The SCS 902A Software Suite has been designed to cover all applications for Acoustic Material characteristics determination with a "Common Data Base". A unique hardware platform and User interface allow to handle all SCS 902A measurement devices.
No multilevel menus: a single label with all necessary information is stored along the results file, and all data become very rapid to recall, print or search; customized versions of the results label are available for automotive industries. All data can be printed and plotted directly in the SCS 902A software system, export functions are also included in Windows environment, allowing a fast and professional reporting using document automation facilities in MS-Office™ environment. Several measurements can be performed on a single sample or a group of the same material, to perform averaging and statistical functions on the Narrow band or 1/3 octave spectra of the alfa coefficient, or to track material development history and quality control based on production time, aging, etc.



SCS 902A software suite: cover page



SCS 902A software: absorption coefficient

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