TestSens Impedance Tube

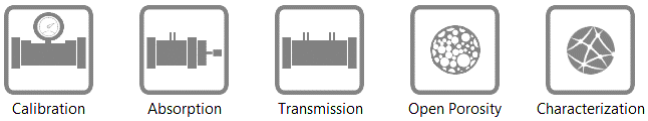
Transmission Loss and
Absorption Coefficient Measurement System

System Features

- Compliance with
  - ASTM E2611 (4-Pole Transfer Matrix Method)
  - ASTM E1050
  - ISO 10534-2 (Transfer Function Method)
- High frequency range, 50-6400 Hz (100mm and 30mm tubes)
- State of art manufacturing
- Industry-leading sensors and analyzer
- High inner surface tolerence
- Acoustic leakage-proof construction

Software Features

- Determination of sound barrier properties (sound transmission loss, characteristic impedance, characteristic wave number)
- Determination of sound absorbing properties (sound absorption coefficient, complex reflection coefficient, surface impedance)
- Determination of dynamic density and dynamic bulk modulus
- Determination of transfer matrix elements
- Random incidence absorption estimation models
- Tube attenuation removal algorithm for very low absorptive materials
- Conical adapter correction for transmission loss measurements
- Determination of intrinsic properties with Johnson-Champoux-Allard-Lafarge (JCAL) material model.
(Porosity, Flow Resistivity, Tortuosity, Viscous Characteristic Length, Thermal Characteristic Length,
Static Thermal Permeability)
- Amplitude and phase calibration of the microphones
- Selectable frequency resolution and number of averages
- ASCII, MS Excel™ export
- Direct export to MSC Actran for poro-elastic materials definition



Sound Absorption Coefficient

The sound absorption coefficient of an acoustic materials can be measured in accordance with the ISO 10534-2 standard titled “Determination of sound absorption coefficient and impedance in impedance tubes – Part2: Transfer-function method”. It is possible to measure between 50-1600 Hz or 200-6400 Hz depending on the tube configuration used. The measurements carried out by generating a random acoustic excitation by the sound source and detecting the reflected-transmitted sound components on the material.

Sound Transmission Loss

In the sound transmission loss tube configuration with four microphones, the transmission loss of acoustic materials can be measured in accordance with the ASTM E2611 standard titled “Measurement of Normal Incidence Sound Transmission of Acoustical Materials Based on the Transfer Matrix”. It is possible to measure between 50-1600 Hz or 200-6400 Hz depending on the tube configuration used. This measurement is made by generating a random acoustic excitation by the sound source and detecting the reflected-transmitted sound power on the material.

System Components	
Analyzer	102.4 kS/s, 100 dB, 0.8 Hz AC/DC Coupled, 4-Input/1-Output
Microphones	GRAS 40PL Freq range: 10 Hz to 20 kHz Dyn range: 33 dB(A) to 142 dB Sensitivity: 9 mV/Pa
Power Amplifier	20W, high quality, to power the loudspeaker in the impedance tube
Speaker	Full Range - 4 ohm
Cablibrator (Optional)	GRAS 42AG Sound pressure level: 94 dB or 114 dB Frequency: 250 Hz or 1 kHz ANSI: S1.40 IEC: 60942 class 1
Cables	Ultra low noise, BNC to 10-32 cables
Tubes	LF-ABS 100mm ⌀, 945mm (L)
	LF-STL 100mm ⌀, 1130mm (L)
	HF-ABS 30mm ⌀, 875mm (L)
	HF-STL 30mm ⌀, 925mm (L)

Configurations

Product Code	Description
Low Frequency Range Configurations (50-1600 Hz)	
LF-ABS	Single-tube Sound Absorption Coefficient Measurement System (Impedance Tube), 100 mm, 50-1600 Hz (2 microphones)
LF-STL	Single-tube Sound Transmission Loss Measurement System, 100 mm, 50-1600 Hz (4 microphones)
LF-ABS/STL	Single-tube Sound Absorption Coefficient + Sound Transmission Loss Measurement System, 100 mm, 50-1600 Hz (4 microphones)
High Frequency Range Configurations (200-6400 Hz)	
HF-ABS	Single-tube Sound Absorption Coefficient Measurement System (Impedance Tube), 30 mm, 200-6400 Hz (2 microphones)
HF-STL	Single-tube Sound Transmission Loss Measurement System, 30 mm, 200-6400 Hz (4 microphones)
HF-ABS/STL	Single-tube Sound Absorption Coefficient + Sound Transmission Loss Measurement System, 30 mm, 200-6400 Hz (4 microphones)
Full Frequency Range Configurations (50-6400 Hz)	
LF/HF-ABS	Multi-tube Sound Absorption Coefficient Measurement System (Impedance Tube), 30+100 mm, 50-6400 Hz (2 microphones)
LF/HF-STL	Multi-tube Sound Transmission Loss Measurement System, 30+100 mm, 50-6400 Hz (4 microphones)
LF/HF-ABS/STL	Multi-tube Sound Absorption Coefficient + Sound Transmission Loss Measurement System, 30+100 mm, 50-6400 Hz (4 microphones) (recomended)

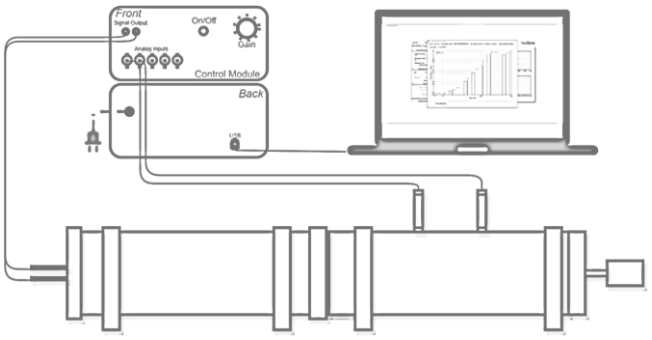
Included Items

Demo melamin foam for trainning and system check
Transport case
Quality test report
Calibration certificates
User manual for installation and software

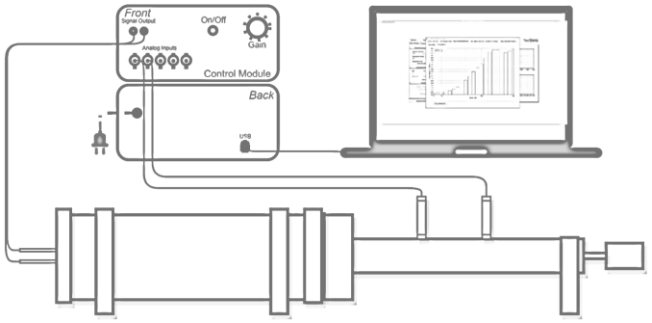
Optional Items

GRAS 42AG Calibrator
GRAS 46BD 1/4" Class 1 Microphones

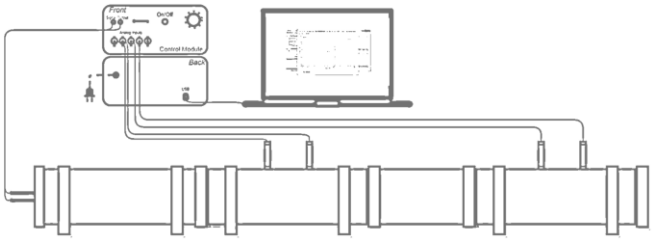
Connection Diagrams



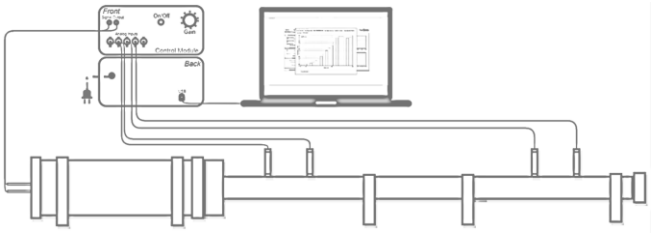
LF-ABS



HF-ABS



LF-STL



HF-STL