

# Impedance Tubes



## Impedance Tubes SW Series

BSWA SW series Impedance Tubes can accurately measure sound absorption coefficients and impedance according to both ISO and ASTM standards. They also support the sound transmission loss measurements based on the Transfer Function Method.

The Transfer Function Method separates the incident and reflected energy from the measured transfer function, and then estimates the acoustic properties of the tested sample installed in the tube.

The SW series Impedance Tubes are specially designed not only to work with the cut samples, but also for direct use in the field. The small size and durable aluminum construction make it easy to be transported and used for estimating the properties of walls, ceilings, installed building materials, road surfaces, different ground surfaces, interiors of vehicles, and etc.

We offers the complete set of Impedance Tube system, which includes:  
the tubes, microphones; DAQ hardware and measurement software.

### SPECIFICATIONS

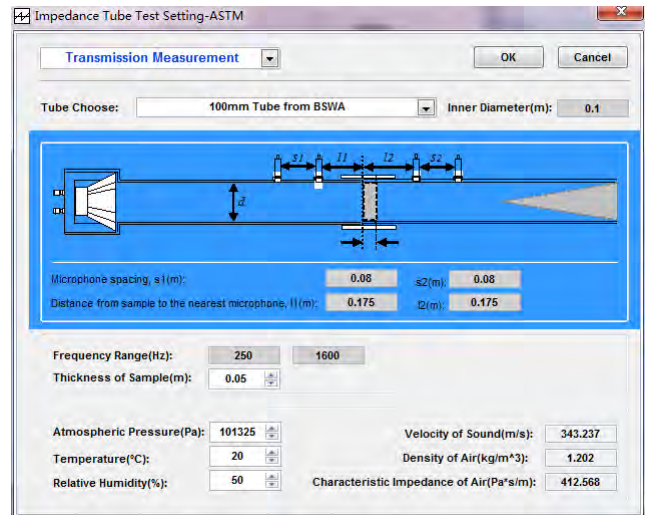
Model	SW230	SW260	SW420	SW470	SW422	SW477
Value to be Measured	Sound Absorption Coefficient ( $\alpha$ )				+ Transmission Loss (TL)	
Standard	GB/T-18696, 2-2002, ISO10534-2, 1998, ASTM E1050-08				Sound Absorption Standard: GB/T-18696, 2-2002, ISO10534-2, 1998, ASTM E1050-08, ASTM E2611-09	
Frequency-range (Hz)	125 ~ 3150	125 ~ 6300	63 ~ 1800	800 ~ 6300	63 ~ 1800	800 ~ 6300
Ø inner Tube Diameter	60 mm	60 & 30 mm	100 mm	30 mm	100 mm	30 mm
Loud speaker	10,16 cm (4") Diameter, 20 Watt, 8 Ohm					

### OPTIONS

Model	SW230	SW230	SW420	SW470	SW422	SW477
6,35 mm (1/4") Microphone				MI-21 or MPA416		
DAQ	MC3022+PA50 or MC3522			MC3242		
Power Amplifier				PA50		
Software	VA-Lab2 Basic + VA-Lab2 IMP-A			VA-Lab4 Basic + VA-Lab4 IMP-AT		

# Impedance Tube Solutions

(Meet both ISO and ASTM Standards)

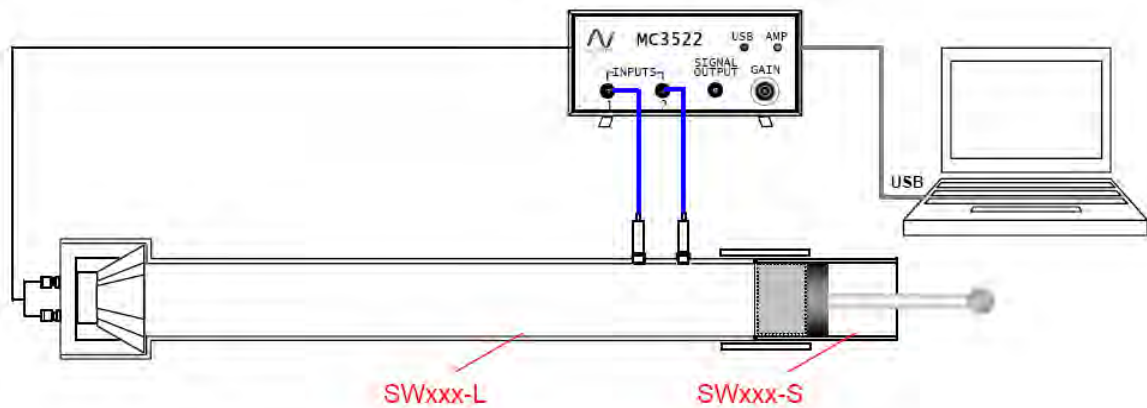


## Material Testing System

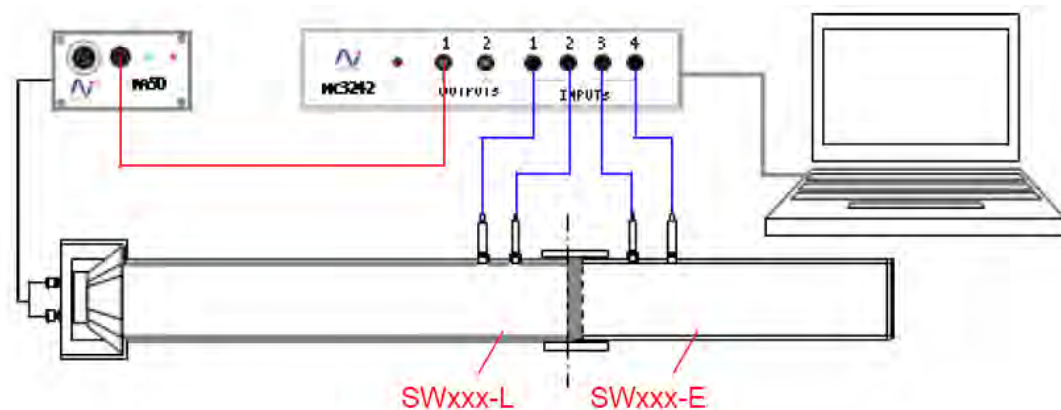
BSWA VA-Lab software has the Impedance Tube Module (VALab IMP) which supports sound absorption and sound insulation measurement for BSWA SW series impedance tubes. The software works with BSWA MC3022, MC3522, MC3242 and MC3642 hardware for data acquisition and analysis. The VA-Lab IMP supports two methods to measure the absorption coefficients of material:

- Method using Standing Wave Ratio (ISO10534-1)
- Transfer Function Method (ISO10534-2, ASTM E1050-08, and ASTM E2611-09)

The VA-Lab IMP also supports four microphones method for sound transmission loss measurements

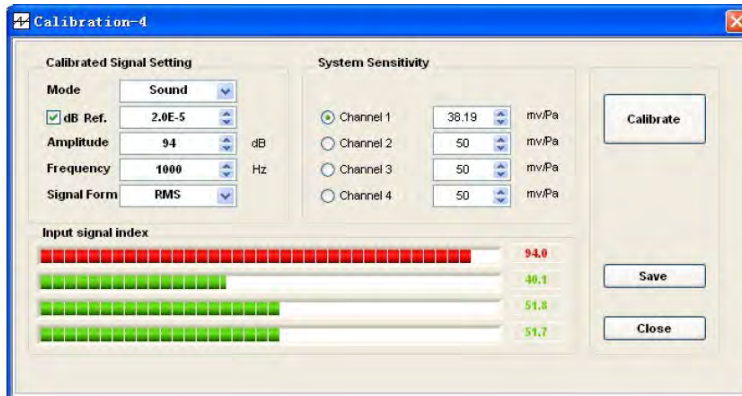


### Impedance Tube System for Sound Absorption Measurement

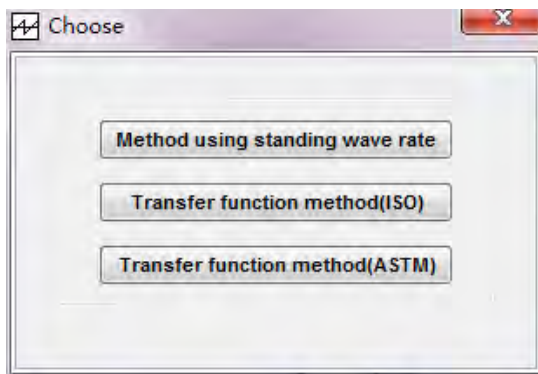


### Impedance Tube System for Transmission Loss Measurement

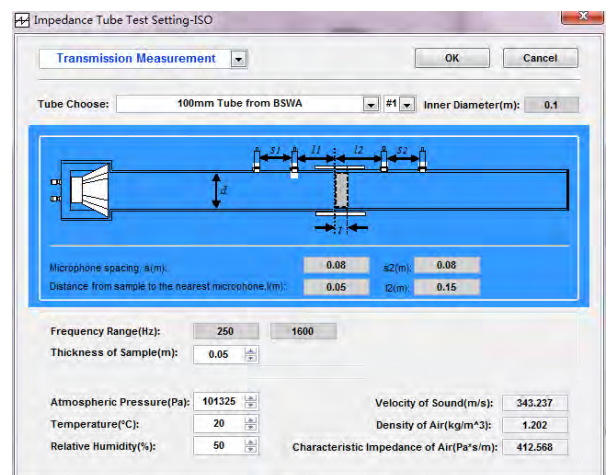
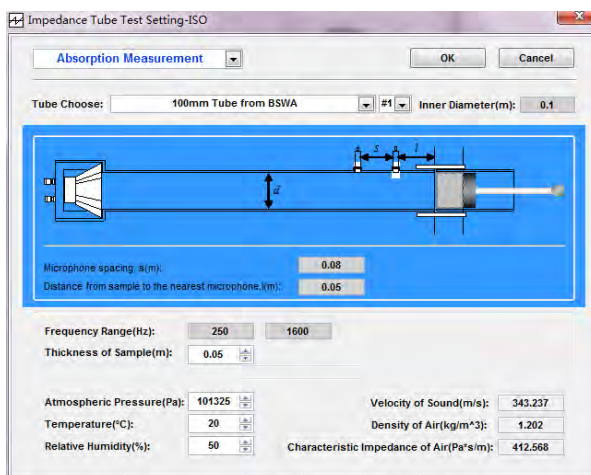
# Software Interfaces



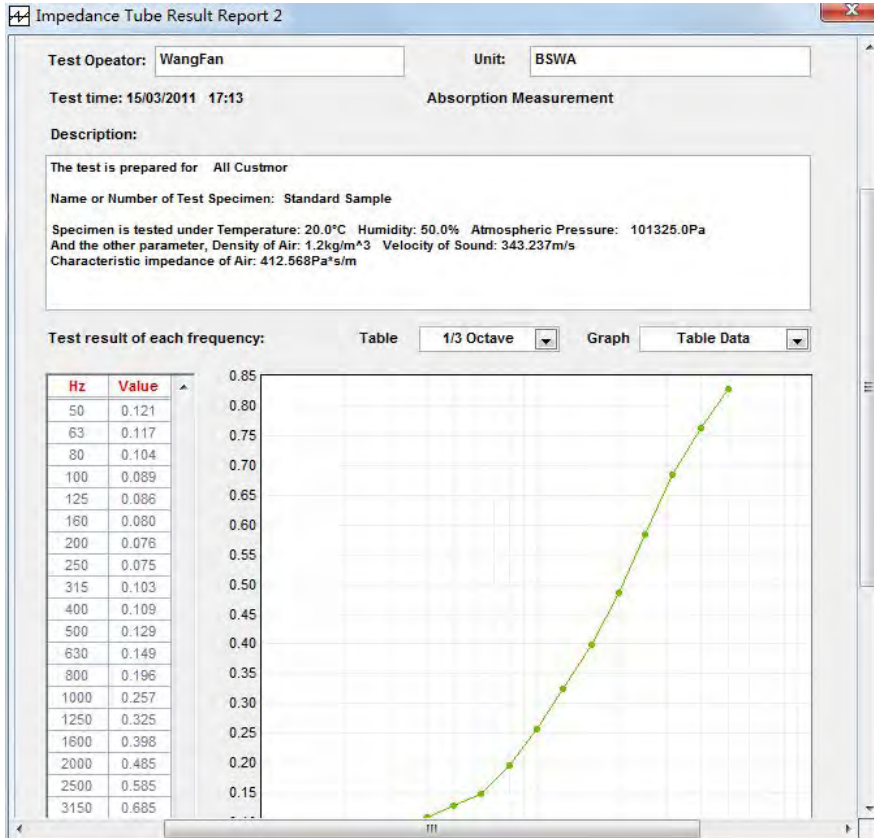
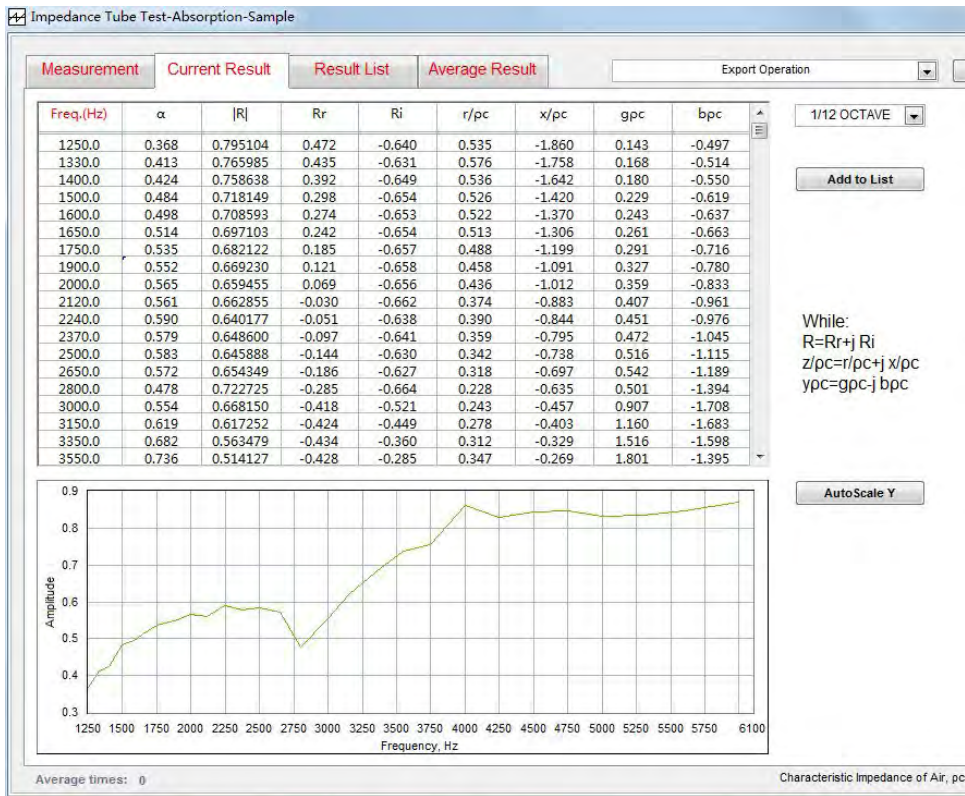
Microphone Calibration Interface



Interface of the Choice of Different Testing Methods



Impedance Tube Setting Interface



### Testing Result and Report

## Typical Complete Setup for Measurement of Sound Absorption and Transmission Loss (Frequency Range: 63 Hz ~6300 Hz)

BSWA IMPEDANCE TUBE SYSTEM SW422+SW477			
#	PRODUCT PART #	DESCRIPTION	NUMBER
1	SW422+SW477	Impedance tubes, SW422 is of 100mm inner diameter and SW477 of 30mm inner diameter. For accurate measurement of sound absorption coefficients and transmission loss(50 ~ 6300 Hz) Sound Absorption Standard: GB/T-18696, 2-2002, ISO10534-2, 1998; ASTM E1050-08; Transmission Loss Standard: ASTM E2611-09	1
2	PA50	Power Amplifier of 50W, to power the loudspeaker in the impedance tube	1
3	MC 3242	Analyzer with 4 ICP input channels and 2 signal output channels, USB powered, 0 ~ 20kHz, to be connected with laptop	1
4	MPA 416	1/4" microphone with Integrated ICP Preamplifier	4
5	CBB005	BNC to BNC cables, 5m, to connect PA50 to MC3242	1
6	CBS005	BNC to SMB cables, 5m, to connect MPA416 to MC3242	4
7	CAA002	2m cable of banana connectors, to connect PA50 to the loudspeaker in the impedance tube	1
8	CA115	Sound Calibrator, 1000Hz, 114dB, Type 2, with adaptor for 1/2" and 1/4" microphones	1
9	VA-Lab4 BASIC	Base software module for measurement of noise and vibration, used for 4-channel analyzer	1
10	VA-Lab4 IMP-AT	Software module for measurement of material impedance values (4 mics are needed), for measurement and the calculation of Sound Absorption and Transmission Loss of material.	1

### Sample Cutter (Option)

