

# TUBE

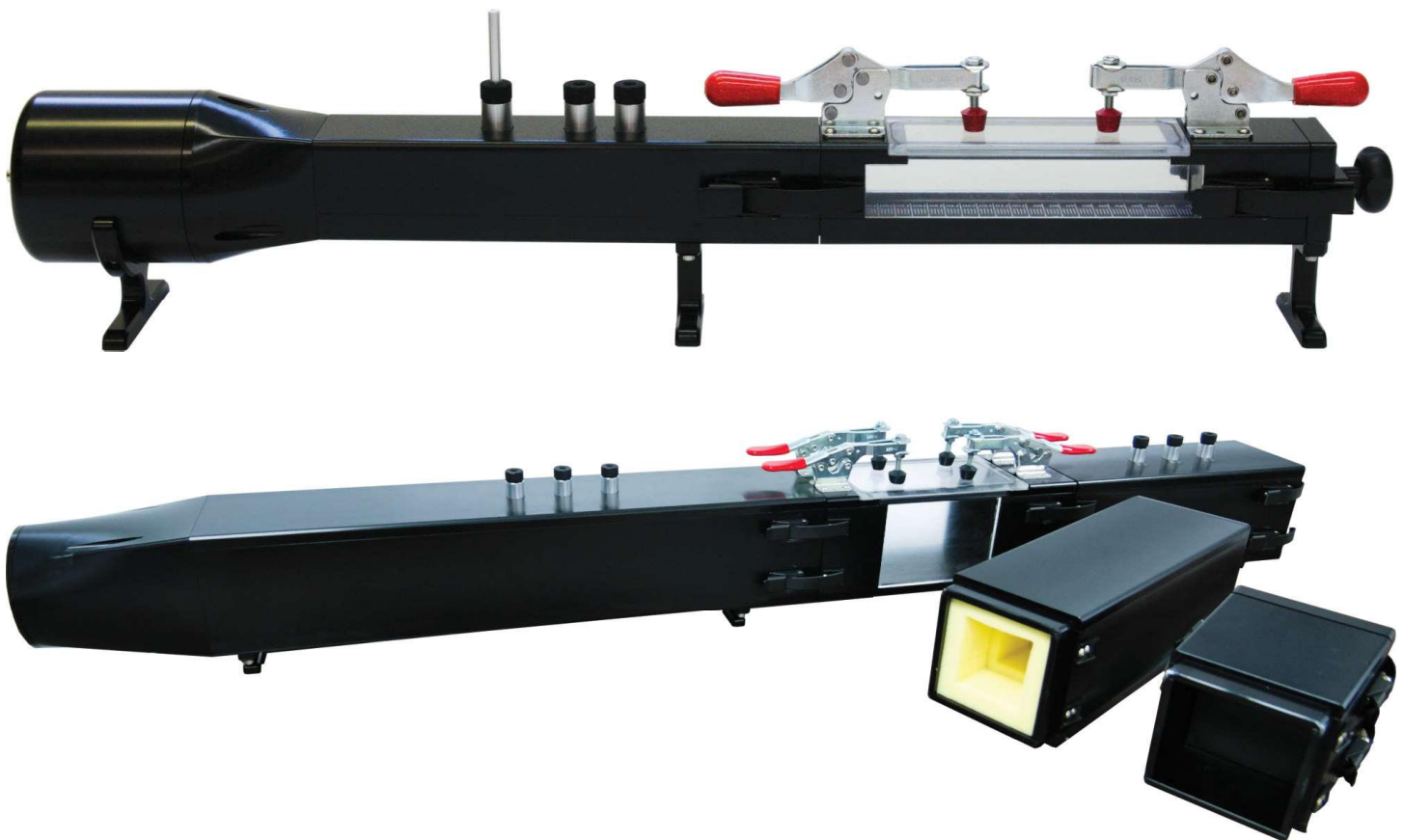
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## Square Impedance & Transmission Tubes

ISO 10534-2, ASTM E1050 and ASTM E2611

2 or 4 Microphones Method



Mecanum's square impedance and transmission tubes are the perfect tools for measuring the acoustic properties of square samples. They are also ideal for acoustics meta-material development and verification.

**MEASURING SYSTEM**

**Test Bench**

- Impedance tube for 2 or 4 microphones methods
- IEPE Microphones (up to 4)
- 24-bit acquisition system (DAQ) with embedded low distortion audio amplifier
- Verification sample
- Mounting rings and grids
- “End” anechoic termination
- Piston with integrated numeric thickness gage
- Ruggedized transportation case

Properties	2 Mics	4 Mics
Sound Absorption Coefficient	x	x
Reflection Coefficient	x	x
Surface Normalized Impedance	x	x
Sound Transmission Loss		x
Transfer Matrix Coefficient		x
Characteristics Impedance		x
Unwrapped Wavenumber		x
Eq. Fluid Dynamic Bulk Density & Modulus		x

**TUBE-X Software**

- Fully controls the procedure (from calibration to measurement) with report generation
- Corrects errors due to weather conditions, internal tube dissipation, mounting rings, mounting grids and automatically controls the sound pressure level inside the tube
- Additional features: microphone acoustic center measurement module, comparison project and merging tools, averaging module, air cavity simulation tool, acoustic penetration depth tool

**OPTIONAL ACCESSORIES**

- ENVIRO weather station
- Custom side section tubes

**TECHNICAL DATA**

**Tubes**

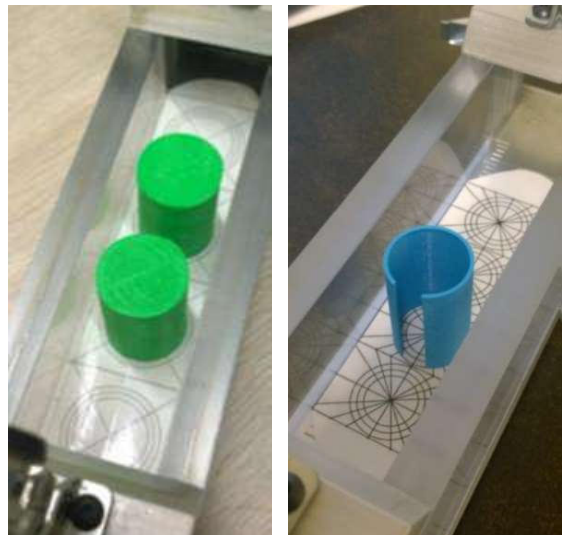
- Nominal dimensions:
  - 38.1 mm: 1400 (L) x 110 (W) x 240 (h) mm - 9 kg
  - 100 mm: 1800 (L) x 160 (W) x 240 (h) mm - 34 kg
- Neodymium speaker with RCA connector
- Sample thickness: up to 200 mm (both 2 & 4 mics)

**Instrumentation**

- Power supply: 100-240 VAC 50/60 Hz 60 W
- Communication: USB 2.0 Type A
- Dimensions: 234 (W) x 223 (D) x 141 (H) mm
- Input: 4 channels 102.4 kHz / 24-bit channel
- Output: 1 channel 96 kHz / 24-bit channel
- 15 W low distortion audio amplifier
- IEPE ¼ " TEDs microphones

**MEASURING RANGE**

- 38.1-mm side-length tube: 45 Hz to 4300 Hz
- 100 mm side length tube: 35 to 1600 Hz
- Hard wall measurement (zero absorption):
  - All ⅓ octave until 4 kHz. < 4 %
  - ⅓ octave 5 kHz and Above < 10 %



**WARRANTY & SUPPORT**

All Mecanum characterization systems are covered by a one-year limited warranty and technical support. Valid only on manufacturing defects and does not cover damage due to abuse or improper use of the equipment.

Please note that the technical aspects of our equipment may be subject to change without notice