



Draft

Department of Mechanical Engineering
Indian Institute of Technology Madras
Chennai – 600 036, India

Prof. Chandramouli
Department of Mechanical Engineering

Ref: No. IITM/CHAND/19-20/ACOUSTIC IMPEDANCE

DATE: 31/01/2020

Due Date: 14/02/2020

Time: 03.00P.M.

**Sub: Quotation Invited for Purchase of Acoustic Impedance and Transmission
Loss Measurement Systems – Reg.**

Dear Sir/Madam,

1. Quotations are invited in duplicate for purchasing Acoustic Impedance and Transmission Loss Measurement System as per specifications enclosed in Annexure.
2. The **quotations are to be in two parts as Technical Bid and as Financial Bid**: The two parts of the offer are to be clearly marked on the envelopes. The two parts of the offer in separate envelopes must be enclosed in the one bigger envelope duly sealed and super scribed with reference number and due date and must be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. **Fax and Email quotation are not acceptable.**
4. Quotations should be valid for 60 days from the due date and period of delivery required, warranty terms etc. should also be clearly indicated. A minimum of one year warranty is required from the date of commissioning.
5. Imported supplies should be quoted **for CIF Madras.**
6. Local firms to quote for free delivery to this Institute. If quoted for Ex-Godown delivery charges be indicated separately.
7. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples / machine/ equipment if called for should be submitted / demonstrated at free of charges, and collected back at the supplier's expenses. Compliancy certificate is to be provided indicating conformity to the technical specifications
8. GST/ Custom Duty / ED if applicable and such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. If this is not indicated no such claim will be admitted at any stage. The taxes leviable should take into consideration that we are entitled to have concessional GST applicable to Non-Government Educational Institutions run with no profit motive for which a concession is given. Sales Tax Certificate will be issued at the time of final settlement of the bill.
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. If the item is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
12. The Guarantee period of the item may be indicated clearly.
13. In case of LC. Payment, 90% of the payment will be made after completion of the supply. The balance 10% of the payment will be made after satisfactory installation of the equipment.
14. IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.
15. **Acceptance and Rejection**:- I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Chandramouli P
Prof. P. Chandramouli



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DATE: 29/01/2020

Due Date: 12/02/2020

Technical Specifications for Acoustic Impedance and Transmission Loss Measurement System

IIT Madras is looking to procure an Acoustic Impedance/Transmission Loss Measurement system for characterizing the sound absorption and transmission loss of acoustic materials. The system specifications are as follows:

1. The frequency range of interest for the measurement is from **50-6300 Hz**; this should be met with a combination of at least two different tube diameters for both the impedance tube and extension tube for transmission loss measurements.
2. The system supplied should meet ASTM E1050 (for absorption) and ASTM E2611 (for transmission loss) standards.
3. The system should include the following
 - 3.1. Built-in speaker modules driven by an amplifier with a power rating of 50 -150 W along with appropriate cables for connections.
 - 3.2. Four free field pre-polarized 1/4" (quarter-inch) or 1/2" (half-inch) microphones with ICP pre-amplifiers; 5 m cables with SMB/LEMO to BNC connectors as appropriate; the sensitivity should remain flat within ± 1 dB from 50 to 5000 Hz and not more than ± 2 dB from 5000 to 6300 Hz. The dynamic range should be from 35-135 dBA and the phase matching should be within ± 5 deg in the frequency range of interest.
 - 3.3. A microphone calibrator with adapters for 1/2" and 1/4" microphones
 - 3.4. A data acquisition (DAQ) system with 4 ICP input channels, with each input channel sampling rate to be at least 50 Ksamples/s and with at least one output channel
 - 3.5. The software to drive the DAQ should come with the following basic features:
 - (a) General signal analysis including FFT, Transfer Function, Coherence, Auto Correlation/Spectrum, Cross Correlation/Spectrum; data to be captured and saved in real-time.
 - (b) Calibration of user selected sound and vibration transducers.

- (c) Octave band analysis in 1/1, 1/3, 1/12 and 1/24 bands
- (d) Signal generation such as sine, square, triangle/saw-tooth wave, white noise, pink noise, capability of frequency sweep, multi-tone, tone burst and driving from a wavefile.
- (e) Ability to store time signals as wavefile and playback capability
- (f) Software for measurement of material impedance values, measurement of transfer function and calculation of sound impedance coefficients and transmission loss of material.

3.6. Appropriate Sample holders for absorption measurements

- 4. The impedance tubes and the extension tubes for transmission loss measurements, should have all the necessary holes drilled with appropriate adapters for assembly of the microphones. The system supplied should be ready for measurement once installed.
- 5. Accessories such as drill tools for the tubes will be desirable.

The quotes should be addressed To:

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