

ISO 10534-2:2023-10 (E)

Acoustics - Determination of acoustic properties in impedance tubes - Part 2: Two-microphone technique for normal sound absorption coefficient and normal surface impedance

Contents		Page
Foreword		iv
1	Scope	1
2	Normative references	1
3	Terms, definitions and symbols	1
4	Principle	5
5	Test equipment	5
5.1	Construction of the impedance tube	5
5.2	Working frequency range	6
5.3	Length of the impedance tube	7
5.4	Microphones	7
5.5	Positions of the microphones	7
5.6	Acoustic centre of the microphone	8
5.7	Test sample holder	8
5.8	Signal processing equipment	9
5.9	Loudspeaker	9
5.10	Signal generator	9
5.11	Thermometer, barometer and relative humidity	9
6	Preliminary test and measurements	10
7	Test specimen mounting	11
8	Test procedure	12
8.1	Specification of the reference plane	12
8.2	Determination of the sound velocity, wavelength and characteristic impedance	12
8.3	Selection of the signal amplitude	13
8.4	Selection of the number of averages	13
8.5	Correction for microphone mismatch	13
8.5.1	General	13
8.5.2	Measurement repeated with the channels interchanged	13
8.5.3	Predetermined calibration factor	14
8.6	Determination of the transfer function between the two locations	15
8.6.1	General	15
8.6.2	Cross- and autospectra-based estimate	15
8.6.3	Frequency-domain deconvolution	17
8.6.4	Impulse-response based estimate	17
8.7	Determination of the reflection coefficient	18
8.8	Determination of the sound absorption coefficient	18
8.9	Determination of the specific acoustic impedance ratio	18
8.10	Determination of the specific acoustic admittance ratio	18
9	Precision	19
10	Test report	19

Annex A (normative) Preliminary measurements	22
Annex B (normative) Procedure for the one-microphone technique	24
Annex C (informative) Theoretical background	25
Annex D (informative) Error sources	27
Annex E (informative) Estimation of diffuse sound absorption coefficient α of locally reacting absorbers from the results of this document	29
Annex F (informative) Estimation of intrinsic properties	30
Bibliography	32