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**Acoustics -- Measurement of sound absorption in a
reverberation room
(English Translation)**

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Foreword

This Standard equivalently adopts ISO 354:2003 Acoustics - Measurement of Sound Absorption in a Reverberation Room.

When this Standard equivalently adopts the international standard, partial terms and definitions

shall refer to GB/T 3947-1996 Acoustical Terminology.

This Standard's Annexes A and B are normative; while Annex C is informative.

This Standard was proposed by Chinese Academy of Sciences.

This Standard shall be under the jurisdiction of National Technical Committee on Acoustics of

Standardization Administration of China (SAC/TC 17).

Drafting organizations of this Standard: China Central Radio, Film & Television Design and Research Institute; and Institute of Acoustics, Chinese Academy of Sciences.

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Acoustics - Measurement of Sound Absorption in a
Reverberation Room

1 Scope

This Standard specifies a method of measuring the sound absorption coefficient of acoustical

materials used as wall or ceiling treatments, or the equivalent sound absorption area of objects,

such as furniture, persons or space absorbers, in a reverberation room. It is not intended to be

used for measuring the absorption characteristics of weakly damped resonators.

The results obtained can be used for comparison purposes and for design calculation with respect to room acoustics and noise control.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 3240-1982 Preferred frequencies for the acoustical measurement

GB/T 3241 Octave-band and fractional-octave-band filters (GB/T 3241-1998, eqv IEC 61260-1995)

GB/T 17247.1 Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere (GB/T 17247.1-2000, eqv ISO 9613-1:1993)

3 Terms and Definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 Decay curve

Graphical representation of the decay of the sound pressure level in a room as a function of

It is, however, possible to generate band-filtered pulses. One practice that works well is to feed the

loudspeaker system with the time-reversed impulse response of a bandpass filter, i.e., a one-third-octave

band filter.

7.3.2 Indirect method

Special sound signals may be used which yield the impulse response only after special processing of the microphone signal. This can provide an improved signal-to-noise ratio. Tone

sweeps or pseudo-random noise (e.g., maximum-length sequences) may be used if the requirements for the spectral characteristics of the source are fulfilled. Because of the gain in

signal-to-noise ratio, the dynamic requirements of the source may be considerably lower than

those set in 7.3.1. If synchronized time averaging is used (e.g., in order to enhance the signal-

to-noise ratio), it is necessary to verify that the impulse response remains unchanged during the

whole measurement process. The signals may be generated by devices that will consist either

of external hard- and software, or devices that form an integrated part of the measuring device.

The bandwidth of the signal shall be greater than one-third octave. The spectrum should be reasonably flat within the actual one-third-octave band to be measured. Alternatively, the broadband noise spectrum may be shaped to provide an approximately pink spectrum in the

range covering the one-third-octave bands with midband frequencies from 100 Hz to 5 kHz, with the reverberation time being measured simultaneously in different one-third-octave bands.

The test signal shall be such that the resulting decay curve for the respective frequency band

meets the level requirements given in 7.2.1.

7.3.3 Recording system

The recording system shall consist of microphones and amplifiers satisfying the requirements

given in 7.1.2 and 7.2.3, as well as an additional device that is capable of digitalizing the recorded signal and of performing all the necessary data processing, including the integration

of the impulse response and the evaluation of the decay curve. In the case of 7.3.2, the recording

system may also contain the necessary hardware and software to process the impulse response

from the recorded signal and also to generate the test signal.

The impulse response shall be filtered in one-third-octave bands. The filtering may be processed

before or after the digitalization of the impulse response, but in any case, before performing the

integration. Analog or digital filters may be used. The filters shall conform to GB/T 3241.

NOTE: The use of special test signals, such as maximum length sequences, not only requires more sophisticated data processing, but also a deeper knowledge of the theoretical background in order to

obtain proper results. Since a detailed introduction to this technique is outside scope of this