

ICS 91.120.20
CCS A 59



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 21228.1-2007

**Acoustics -- Sound-scattering properties of surfaces -- Part 1:
Measurement of the random-incidence scattering coefficient in
a reverberation room**

声学 表面声散射特性 第1部分：混响室中无规入射声散射系数测量
(English Translation)

Issued on: November 14, 2007

Implemented on: May 1, 2008

Issued by: Standardization Administration of China

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 Principle	
Frequency range 3	
6 Test schedule	
6.1 Reverberation chamber	
6.2 Rotary table and the base plate	
6.3 Specimen	
7 Test Step	
7.1 Test signal	
7.2 Sound source and the receiving device	
5 The impulse response measuring 7.3	
7.4 Temperature and relative humidity	
Estimated 7.5 decay curve	
8 Expression of results	
8.1 Calculation Method	
8.2 Accuracy	
8.3 Expression of results	
9 Test report	
Accuracy Appendix A (informative) measurement result	
Reference	

Foreword

GB/T 21228 "Acoustics surface acoustic scattering properties" includes the following two parts.

--- Part 1. reverberation chamber random incident sound scattering coefficient measurement

--- Part 2. free-field directional diffusion coefficient measurement this part of GB/T 21228

Part 1, this part identical with ISO 17497-1:2004 "Acoustics surface acoustic scattering properties Part 1. The reverberation chamber measuring random incident sound scattering coefficient "(in English).

Appendix A of this section is an informative annex.

This section proposed by the Chinese Academy of Sciences.

The acoustics in part by the National Standardization Technical Committee (SAC/TC17) centralized.

This part mainly drafted by. Institute of Acoustics, Chinese Academy of Building Research, Tongji University, in radio and television broadcasting movies electricity Depending on the design research institute.

Introduction

The degree of surface acoustic scattering in all aspects of room acoustics (eg. concert halls, recording studios, workshops and reverberation chamber) is very important to study. scattering Deficiency can cause serious deviation from the exponential attenuation of sound pressure. On the other hand, the strong scattering by the interior surface can be approximated by diffusion of sound field.

Indoor degree scattering is an important factor associated with indoor quality.

This section GB/T 21228 will sound scattering coefficient as a new concept is introduced. Acoustic scattering coefficient and absorption coefficient in the count room acoustics Considered very useful simulation and predictive modeling. Surface scattering model for the establishment of a reliable predicted room acoustics is very important.

This section GB/T 21228 proposed a quantitative method for measuring surface scattering characteristics, instead of previously applied but it was not widely accepted estimate algorithm.

GB/T 21228 Part 2 will focus on measuring method of directional diffusion coefficient, diffusion coefficient, although different from the point of random Incident acoustic scattering coefficient, but relevant. Acoustic scattering coefficient is used to describe the rough degree of physical acoustic scattering, diffusion coefficient is described sound Directional uniformity of scattering that diffusion surface quality. Therefore, the two concepts are needed, they have different applications.

GB/T 21228.1-2007/ISO 17497-1:2004 Acoustic surface acoustic scattering properties Random incidence reverberation chamber. Part 1 Acoustic scattering coefficient measurement

1 Scope

This section GB/T 21228 requirements caused by the surface roughness of the surface acoustic measurement method for random incidence scattering coefficient. It should be mixed Anechoic chamber to full-scale model or physical scale model measurements. Measurement results can be used to describe how much sound reflections from the surface deviates from the mirror Surface reflection. The results can also be used to compare and design calculation related to room acoustics and noise control.

This method is not uniformly distributed space used to characterize the surface acoustic scattering properties.

2 Normative references

The following documents contain provisions which, through reference GB/T 21228 in this section constitute provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 17247.1 acoustic attenuation of sound during propagation outdoors - Part 1. Calculation (GB/T 17247.1-2000 atmospheric sound absorption, idt ISO 9613-1:1993)
GB/T 20247 acoustic reverberation chamber sound absorption measurements (GB/T 20247-2006, ISO 354:2003, IDT)

3 Terms and Definitions

The following terms and definitions apply to this section.

Follow Snell (Snel) law of reflection, namely. the angle of incidence equals the angle of reflection.

NOTE: specular reflection can be approximated by the incident sound is much larger than the wavelength of the rigid planar.

Energy density is uniform in all directions of propagation of the sound field randomly distributed.

J_{θ}

After subtracting the total sound energy reflection specular reflection of sound energy to the total energy of the reflected sound ratio.

Note: Theoretically, J_{θ} can be between 0 and 1 values, where. 0 is completely mirroring surface, represents a completely scattering surface. Subscript is used to indicate the phase θ

the surface normal angle of incidence. If there is no index, then a random incident.

After subtracting the total reflected sound energy can diffuse sound field in the ratio of surface to total reflection mirror reflections of acoustic energy.

GB/T 21228.1-2007/ISO 17497-1:2004