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

GB/T 12060.16-2017

Replacing GB/T 14476-1993; GB/T 15485-1995

**Sound system equipment -- Part 16: Objective rating of speech
intelligibility by speech transmission index**

声系统设备 第16部分：通过语音传输指数客观评价言语可懂度

(English Translation)

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Foreword

GB/T 12060 "Acoustic System Equipment" has released or plans to release the following sections.

- Part 1. Overview;
- Part 2. General terminology and calculation methods;
- Part 3. Audio amplifier measurement methods;
- Part 4. Microphone measurement methods;
- Part 5. Speaker main performance testing methods;
- Part 6. Auxiliary passive components;
- Part 7. Headphones and headphones measurement methods;
- Part 8. Automatic gain control device;
- Part 9. Artificial reverberation, time delay and frequency shift device measurement methods;
- Part 10. Peak program meter;
- Part 11. Application of connectors for acoustic system equipment interconnection;
- Part 12. Application of connectors for broadcasting and similar sound systems;
- Part 13. Speaker listening test;
- Part 14. Round and oval speakers, dimensions and installation dimensions;
- Part 16. objective evaluation of speech intelligibility through voice transmission index;
- Part 17. Standard sound meter;
- Part 18. Peak Program Meter - Digital Audio Peak Meter.

This section GB/T 12060 Part 16.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 14476-1993 "objective assessment of the Office of the language intelligibility" RASTI "Act and GB/T 15485-1995 "Calculation method of acoustic language definition index", compared with GB/T 14476-1993 and GB/T 15485-1995, the main technical changes as follows.

--- Use the complete STI method, as well as two simplified forms of the complete STI method, STIPA and STITEL, instead of RASTI Law and Clarity Index (AI) methods (see Chapter 4, Chapter 5, Chapter 6 and Appendix A, Appendix B, Appendix C).

This section uses the redrafted law to amend the use of IEC 60268-16:2011 "Sound System Equipment Part 16. Through the voice transmission index Objective evaluation of speech intelligibility ".

This part of IEC 60268-16:2011 technical differences and the reasons are as follows.

- Clear reference speech sound level measurements in the free field to avoid the impact of reflected sound (see 3.16);
- Correct the modulation frequency in IEC 60268-16:2011 The expression "F" is "fm" (see 4.2.1, 4.2.2);
- Based on the existing research, this part is used to objectively evaluate the applicability of Chinese verbal intelligibility explained (see 4.6);
- Correct the IEC 60268-16:2011 corresponding to the impulse response square printing missing problem [see equation (4)];
- Based on the latest literature, the importance of equalizing the frequency response of the test sound source (system) has been supplemented to avoid the resulting comparison Large measurement error [see 7.2 b)];
- Based on the latest literature, the importance of testing the directivity of the sound source has been supplemented to avoid the resulting large measurement error Poor [see 7.2 c)];
- Clarified that in measuring the speech intelligibility of natural sounding rooms and halls, the sound level of the test signal is calibrated in a free field (see 7.6.1);
- Correct the "Chebyshev II filter" in IEC 60268-16:2011 as "Chebyshev I filter", the original Wrong (see A.4.2);
- Correct IEC 60268-16:2011 in the "intensity modulation I" for the "modulation transfer ratio", the original text is wrong [see A.5.1.1 c)];
- Removed Appendix D of IEC 60268-16:2011;
- Correct IEC 60268-16:2011 "auditory masking factor amf" as "auditory masking level amdB", the original text is wrong [see Table L.1, 2), 3)];
- Correct the "MTIk, f" in IEC 60268-16:2011 as "TIk, f" with the original text [4c in Table L.1)].

Please note that some of this document may be patentable. The issuing agencies of this document do not bear the responsibility of identifying these patents.

This section is proposed by the Chinese Academy of Sciences.

This part of the National Acoustic Standardization Technical Committee (SAC/TC17) and the National Audio, Video and Multimedia Systems and Equipment Standardization Technical Committee (SAC/TC242) Common.

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Introduction

The Speech Transmission Index (STI) is an objective measure of the intelligibility of a speaker's speech that arrives at the listener through the transmission path.

STI method has been put forward since the 1970s, has been in the process of improvement and development. With the continuous revision of IEC 60268-16, the major improvements of the STI approach have been integrated to provide a broad, complete and clear STI technical standard.

Speech is the main means of communication between people. In many cases, the speech signal is affected by the signal path between the speaker and the listener or transmission path, resulting in a decrease in speech intelligibility at the listener's location. To determine the speech intelligibility after passing through the transmission path the degree of reduction, a rapid and objective measurement method has been developed, namely the voice transmission index (STI). By specifying the transmission path of the test signal, and then analyze the received signal to derive the transmission quality of the transmission path and use the value between 0 to 1, which is STI. Based on the STI value, the possible verbal intelligibility of the transmission path can be determined. Although the STI method still has some limitations, it is also proved Ming is very effective under many conditions.

STI can be used to measure speech intelligibility in a variety of different electronic systems and acoustic environments. Typical applications include.

- a) Measurement of public address systems and sound reinforcement systems;
- b) measurement and identification of voice alarm system and emergency notification system;
- c) Measurement and qualification of communication circuits (systems), such as internal and wireless communication systems;
- d) measure speech intelligibility of rooms and halls (natural sound or sound reinforcement system);
- e) evaluate direct verbal communication (without the use of PA systems), including rooms and various acoustic environments (eg in transport);
- f) Speech comprehension evaluation of hearing aid systems.

Note: The STI method does not measure and evaluate verbal privacy or speech masking systems.

STI users come from all walks of life and potential users may include.

- a) appraisers of voice alarm systems and other types of emergency notification systems;