ATIS-0600005.2023

Acoustic Measurement

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American National Standard for Telecommunications

Acoustic Measurement

Alliance for Telecommunications Industry Solutions

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American National Standards Institute, Inc.

Abstract

Acoustic noise from telecom equipment adds unregulated environmental noise. This standard provides measurement methods for acoustic noise that are accurate and repeatable. Emission limits are set in units of sound power for equipment installed in temperature-controlled environments.

Foreword

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Sustainability in Telecom: Energy and Protection (STEP) Committee – formerly the Network Interface, Power, and Protection (NIPP) Committee – engages industry expertise to develop standards and technical reports for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power, and protection. The work products of STEP enable vendors, operators, and their customers to deploy and operate reliable, environmentally sustainable, energy efficient communications technologies. STEP is committed to proactive engagement with national, regional, and international standards development organizations and forums that share its scope of work.

The mandatory requirements are designated by the word shall and recommendations by the word should. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages. The word may denotes an optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time it approved this document, STEP, which is responsible for the development of this Standard, had the following leadership:

J. Jackson, STEP Chair (Southwire)

E. Gallo, STEP Vice Chair (Ericsson)

C. Von Hagel, STEP NPP Chair (Intertek)

M. Levitre, STEP NPP Vice Chair (Southwire)

The Network Physical Protection (NPP) Subcommittee was responsible for the development of this document.

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1 Executive Summary

This standard identifies sound power as the preferred method of measuring the emission of acoustic noise from telecommunications equipment. The main focus is to use sound power to gain repeatability and accuracy over sound pressure methods. This standard will also provide the emission limits for the temperature controlled environment (i.e., Central Office, data centers) for the North American environment.

The standards used to determine the sound power measurement include ANSI/ASA S12.10 [Ref 3], ANSI/ASA S12.12 [Ref 4], ANSI/ASA S12.54 [Ref 5], and ETSI 300 753 [Ref 1]. These documents set forth testing methodologies for accurate measuring, reporting, and verification of the noise emission of telecommunications equipment. The A-weighted sound power level in units of decibels is used to quantify acoustic noise emission.

1.1 Application

This standard applies only to the airborne acoustic noise generated by equipment during operation under the conditions defined in this standard. The noise limit for equipment under maintenance conditions (i.e., with door opened) is not defined or measured. The noise limit while operating at maximum fan speed is not defined, but is measured. The limits also do not apply to equipment features that produce sound as an intentional aspect of their operation, such as alarm signals, attention signals, or speech signals.

This standard covers equipment intended to be installed in a line-up or as stand-alone pieces of equipment.

2 Normative References

This report contains material from other publications. These references are cited at the appropriate places in the text and are listed below. The standards and documents contain provisions, which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision; however, only the editions cited are applicable for this standard.

[Ref 1] ETSI 300 753, *Equipment Engineering (EE); Acoustic Noise Emitted by Telecommunications Equipment*.[1]

[Ref 2] GR-63-CORE, *NEBS Requirements: Physical Protection, Issue 5*.[2]

[Ref 3] ANSI/ASA S12.10, *Acoustics – Measurement of Airborne Noise Emitted by Information Technology and Telecommunications Equipment*.[3]

[Ref 4] ANSI/ASA S12.12, *Engineering Method for the Determination of Sound Power Levels of Noise Sources Using Sound Intensity*.[3]

[Ref 5] ANSI/ASA S12.54, *Acoustics – Determination of Sound Power Levels and Sound Energy Levels of Noise Sources Using Sound Pressure – Engineering Method in an Essentially Free Field Over a Reflecting Plane*.[3]

[1] This document is available from the European Telecommunications Standards Institute (ETSI). < http://www.etsi.org/standards >

[2] This document is available from Ericsson at: < https://telecom-info.njdepot.ericsson.net/ >

[3] This document is available from the Acoustical Society of America (ASA) at < https://global.ihs.com/home_page_asa.cfm?&rid=ASA >.