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AMERICAN NATIONAL STANDARD

Pre-Installation Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment

ANSI/ASA S12.67-2008

Accredited Standards Committee S12, Noise

Standards Secretariat
Acoustical Society of America
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Pre-Installation Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment

Secretariat:

Acoustical Society of America

Approved November 20, 2008 by:

American National Standards Institute, Inc.

Abstract

This standard describes instrumentation and procedures for the pre-installation measurement and analysis of airborne noise generated by shipboard equipment. Maximum noise level criteria are presented for several types of equipment. This standard may be used in the achievement of shipboard noise goals through the timely and affordable airborne noise testing of shipboard equipment before it is delivered and installed.

This standard is based on MIL-STD-740-1 “Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment” and MIL-STD-1474D (Requirement 5, Shipboard Equipment Noise).

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Foreword

[*This Foreword is for information only and is not a part of the American National Standard ANSI/ASA S12.67-2008* American National Standard Pre-Installation Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment.]

This standard comprises a part of a group of definitions, standards, and specifications for use in noise. It was developed and approved by Accredited Standards Committee S12, Noise, under its approved operating procedures. Those procedures have been accredited by the American National Standards Institute (ANSI). The Scope of Accredited Standards Committee S12 is as follows:

> *Standards, specifications, and terminology in the field of acoustical noise pertaining to methods of measurement, evaluation, and control; including biological safety, tolerance, and comfort, and physical acoustics as related to environmental and occupational noise.*

This standard is not comparable to any existing ISO Standard.

At the time this standard was submitted to Accredited Standards Committee S12, Noise, for approval, the membership was as follows:

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Individual Experts of Accredited Standards Committee S12, Noise, were:

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Working Group S12/WG 40 – "Measurement of the noise aboard ships" which assisted Accredited Standards Committee S12, Noise, in the development of this standard, had the following membership:

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Suggestions for improvements to this standard will be welcomed. They should be sent to Accredited Standards Committee S12, Noise, in care of the Standards Secretariat of the Acoustical Society of America, 35 Pinelawn Road, Suite 114E, Melville, New York 11747-3177. Telephone: 631-390-0215; FAX: 631-390-0217; E-mail: asastds@aip.org.

Introduction

The installation of machinery and operating equipment onboard ship often leads to a degradation in the acoustic environment in occupied spaces. Measurements taken according to standardized procedures and compared with acceptance criteria will provide requisite information to the shipbuilder for the proper selection and installation of equipment and for adequate acoustic design of shipboard spaces and areas.

This standard may be used in ship acquisition programs for the following purposes:

- To separate individual equipment noise from other compartment sources
- To avoid expensive and time-consuming rework of noisy equipment
- To provide early confirmation of the ship's acoustical design
- To assist in compartment noise predictions

The measurement procedures delineated herein primarily measure steady-state sound pressure levels due to equipment and near the equipment. Impact noise measurements are also included. These levels serve well in predicting sound pressure levels from the subject equipment to which crew members are exposed in ship spaces or compartments which have typical acoustic characteristics. To that end, when using this standard it is the intent that the sound pressure levels measured at each location near the equipment be compared to specified acceptance criteria and that an excess at any frequency or any location be considered a failure; averaging methods are not utilized. Sound power procedures and criteria, although useful under certain circumstances, are not covered in this standard.

American National Standard

Pre-Installation Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment

1 Scope

This standard specifies procedures and instrumentation for the sound pressure measurement of airborne sound generated by shipboard equipment. Exceptions or additions to the requirements of this standard may be granted or added by the purchaser of equipment being tested in accordance with this standard. Overall noise in ship compartments is a combination of noise generated from all equipment installed in or near that compartment as well as other possible sources. Noise in ship compartments is not addressed in this standard.

Airborne acceptance criteria for several grades of equipment are presented in Annex A.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies.

ANSI S1.1-1994 (R 2004) *American National Standard Acoustical Terminology*

ANSI S1.4-1983 (R 2006) *American National Standard Specification for Sound Level Meters*

ANSI S1.11-2004 *American National Standard Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters*

ANSI S1.40-2006 *American National Standard Specifications and Verification Procedures for Sound Calibrators*

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in ANSI S1.1-1994 (R 2004) and the following apply:

3.1 equipment. Refers to any machine system, subsystem, or part thereof, which is being measured to determine compliance with the airborne acceptance criteria.

3.2 Mounts and equipment mounting

3.2.1 resilient mount. Device with elastic properties used to reduce transmission of structure-borne noise. Typically a shaped block of rubber or similar elastic material and used at discrete locations at the component's attachment points for the purpose of supporting the component and providing acoustic isolation between the component and the support foundation or structure, and which approximates a free-free condition.