



Standard Test Method for Laboratory Measurement of Acoustical Effectiveness of Ship Noise Treatments Laboratory Measurement of Acoustical Effectiveness for Marine Bulkhead and Deck Treatments¹

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INTRODUCTION

This test method is designed to measure the acoustical effectiveness of treatments that are intended to reduce airborne noise on ships. Such treatments would be applied to compartment structural partitions such as bulkheads, decks, and side shells. To fully characterize the acoustical performance of a treatment, five parameters must be assessed: transmission loss, radiation efficiency, acceptance, absorption, and damping. This test method focuses on the assessment of the first three, and provides for convenient assessments of absorption and damping. Tests discussed in this method are based on the Test Method E90 setup and procedure. This test method is not intended to be a replacement of Test Method E90; conversely, this method builds on the E90 method that is now well established. Similarly, this test method does not replace absorption testing discussed in Test Method C423, nor damping testing discussed in Test Method E756, though for reasons of convenience this method can be used to make approximate assessments of how different treatments may impact these parameters.

1. Scope

1.1 This test method covers the laboratory measurement of the acoustical effectiveness of treatments installed on ship bulkheads, decks, and side shells. Measurements are focused on assessing changes in transmission loss, radiation efficiency, and acceptance that occur when treatments are applied. Measurements of changes to absorption and damping are addressed in Appendix X1 and Appendix X2, respectively.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.4 Any material that is to be installed on a marine division must meet appropriate fire, combustibility, and other applicable

SOLAS, USCG, IMO, Navy, or other required non-acoustical standards and specifications. See Appendix X3 for additional information.

2. Referenced Documents

2.1 ASTM Standards:²

C423 Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

E634 Practice for Sampling of Zinc and Zinc Alloys by Spark Atomic Emission Spectrometry

E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E756 Test Method for Measuring Vibration-Damping Properties of Materials

2.2 ANSI Standards:³

ANSI S1.4-1983 (R2006) Specification for Sound Level Meters

ANSI S1.6-1984 (R2011) Preferred Frequencies, Frequency

¹ This test method is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.03 on Sound Transmission.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.