



SURFACE VEHICLE STANDARD

J1075™**JUL2021**Issued 1978-04
Revised 2021-07

Superseding J1075 MAR2013

Sound Measurement - Construction Site

RATIONALE

SAE J1075 is being revised due to its continued value as a standardized test method for measuring the non-specific noise levels around the perimeter of a work site. Minor revisions have been made to reflect current testing practices.

1. SCOPE

This SAE Standard sets forth measurement procedures and instrumentation to be used for determining a “representative” sound level during a representative time period at selected measurement locations on a construction site boundary. The document is not intended for use in determining occupational hearing damage risk. Determination of a representative time period is left to the judgment of the user.

1.1 Purpose

The purpose of this SAE document is to set forth procedures that may be used by construction site management for self-regulation and construction site planning or by state and local officials for the enforcement of construction site noise regulations. Two measurement methods are provided to obtain the time-integrated equivalent sound level, L_{eq} , emitted by construction site activity. First, a sampling procedure is recommended for use with a sound level meter. Second, a measurement procedure using an integrating sound level meter is presented. The latter procedure is generally preferred. Use of this document provides sound level data representative of the complex time-varying sounds emitted by construction activities, which may be used to estimate community reaction to the construction activity.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J184 Qualifying a Sound Data Acquisition System

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For more information on this standard, visit
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Documents

Document Sharing Hub

2.1.2 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ANSI S1.4 Specification for Sound Level Meters

ANSI S1.40 Specification for Acoustical Calibrators

ANSI S12.9/3 Quantities and Procedures for Description and Measurement of Environmental Sound, Part 3: Short-Term Measurement with an Observer Present

2.1.3 IEC Publications

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

IEC 60942 Sound Calibrators

IEC 61672-1 Electroacoustics—Sound Level Meters—Part 1: Specifications

3. DEFINITIONS

3.1 CONSTRUCTION SITE

The construction site is that area within the defined boundaries of the project. This includes defined boundary lines of the project itself, plus any staging area outside those defined boundary lines used expressly for construction or demolition.

3.2 CONSTRUCTION SITE BOUNDARIES

The outermost limit lines of the construction site.

3.3 NOISE SENSITIVE AREA

Property such as that used for public, commercial, religious, or educational purposes, or home dwellings, parks, and other special-purpose areas in the vicinity of a construction site where the ambient noise is less than the construction site sound level.

3.4 INSTRUMENT NOISE FLOOR

The instrument noise floor is the total acoustical and electrical noise from all sources in a system that interferes with the production, transmission, detection, measurement, or recording of a signal. The sound level meter range setting must be selected so that the instrument noise floor is 10 dB below measured ambient sound.

3.5 AMBIENT SOUND

The all-encompassing sound typically associated with the environment in a given area, being composed of sounds from many sources far and near, when the construction site is inactive.

3.6 REPRESENTATIVE SOUND LEVEL, L_A

The average of sound level samples obtained in accordance with the procedures.

3.7 EQUIVALENT (OR TIME-AVERAGE) SOUND LEVEL, L_{eq}

Equivalent or time-average sound is the square root of the time-average of instantaneous sound pressure squared. It is also termed the root-mean-square sound. Equivalent sound level is ten times the common logarithm of the square of the ratio of the equivalent or time-average sound to the reference sound, p_o , of 20 μ Pa.

4. INSTRUMENTATION

4.1 Sound Level Measurement Instrument

- 4.1.1 If 6.1 is to be followed, a sound level meter meeting Type 1 or Type 2 requirements of ANSI S1.4-1983 (R1997) or IEC 61672-1 shall be used.
- 4.1.2 If 6.2 is to be followed, an integrating sound level meter that provides the equivalent sound level for a measurement period of at least 30 minutes shall be used. The integrating-averaging sound level meter meeting Type 1 or Type 2 requirements of IEC 61672-1 should be used. The integrating sound level meter shall have a “pause” or “standby” capability that inhibits data collection. The dynamic range of the instrument should be at least 80 dB, including crest factor.
- 4.1.3 As an alternative to making direct measurements with a sound level meter or integrating sound level meter, a microphone or sound level meter may be used with a graphic level recorder and data analysis instrumentation providing the system meets the requirements of SAE J184.

4.2 Calibrator

An acoustic calibrator with an accuracy within ± 0.5 dB meeting the requirements of IEC 60942.

4.3 Windscreen

A microphone windscreen shall be used except when the user is certain that the wind-induced noise is more than 15 dB below the sound level of the source being measured. A windscreen may be used at all times. When a windscreen is used, it shall be of a type recommended by the microphone manufacturer, and it shall not affect the A-weighted sound level of the source being measured by more than ± 0.5 dB in a calm (no wind) situation.

4.4 Anemometer

An anemometer or other device for use in measurement of wind speed and direction with an accuracy within $\pm 10\%$ at 20 km/h.

5. SITE CHARACTERIZATION

- 5.1 Obtain specific drawings, survey stake locations, or other pertinent information and sketch the boundaries of the construction site and noise sensitive areas; a facsimile of Figure 1 may be used. Note the distance between the noise sensitive area(s) and the nearest boundaries.
- 5.2 Obtain information to determine location and activity pattern of equipment on the construction site during the planned measurement period.
- 5.3 Based on 5.1 and 5.2, select the sound level measurement location(s).

6. MEASUREMENTS

Two sound level measurement procedures are presented. A manual sampling procedure using a sound level meter is given in 6.1. Paragraph 6.2 describes the procedure for using an integrating-averaging sound level meter.

NOTE: ANSI S12.9/3 meets the requirements of this document and provides a more detailed method to measure L_{eq} corrected for ambient noise.