



Standard Specification for Surge Suppressors for Shipboard Use¹

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1. Scope

1.1 This specification establishes performance requirements of surge suppressors for use on shipboard ac power circuits.

1.2 Surge suppressor shall be a protective device for limiting voltage transients on equipment by discharging, dissipating internally, bypassing surge current, or a combination thereof and which prevents continued flow of follow current to ground and is capable of repeating these functions.

1.3 Surge suppressors covered by this specification may consist of a single circuit element or may be a hybrid device using several suppression devices.

2. Referenced Documents

2.1 The following documents of the issue in effect on the date of material purchase form a part of this specification to the extent referenced herein:

2.2 *American National Standards:*²

ANSI/IEEE Std 4 IEEE Standard Techniques for High Voltage Testing

ANSI/IEEE C62.41 Recommended Practice on Surge Voltage in Low-Voltage AC Power Circuits

ANSI/IEEE C62.45 Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits

ANSI/IEEE C84.1 Electrical Power Systems and Equipment—Voltage Ratings

2.3 *Military Standard:*³

MIL-STD-1399 Section 300; Military Standard Interface Standard for Shipboard Systems, Section 300, Electric Power, Alternating Current

2.4 *Underwriters Laboratories Standard:*⁴

UL 1449 Transient Voltage Surge Suppressors, 2nd Edition

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.10 on Electrical.

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² Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

⁴ Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.

3. Terminology

3.1 Definitions:

NOTE 1—These definitions other than specific to the standard are taken from UL 1449, ANSI/IEEE C62.41, and MIL-STD 1399 to provide for harmonization of terms.

3.2 *power interface*—The electrical points where the surge suppression device is electrically connected to the ac power system.

3.3 *combination wave*—A surge delivered by an instrument that has the inherent capability of applying a 1.2/50- μ s voltage wave across an open circuit and delivering an 8/20- μ s current wave into a short circuit. The exact wave that is delivered is determined by the instantaneous impedance to which the combination wave is applied. (Also called combination voltage/current surge or combination V/I surge.)

3.4 *crest (peak) value (of a wave, surge or impulse)*—The maximum value that a wave, surge, or impulse attains.

3.5 *electric power source*—The electric power that is supplied for testing.

3.6 *electric power system ground*—Ground is a plane or surface used by the electric power system as a common reference to establish zero potential. Usually, this surface is the metallic hull of the ship. On a nonmetallic hull ship, a special ground system is installed for this purpose.

3.7 *follow (power) current*—The current from the connected power source that flows through a surge protective device following the passage of discharge current.

3.8 *frequency tolerance*—Frequency tolerance is the maximum permitted departure from nominal frequency during normal operation, excluding transient and cyclic frequency variations. This includes variations such as those caused by load changes, switchboard frequency meter error, and drift. Unless specified otherwise, frequency tolerance shall be considered to be $\pm 10\%$ of nominal frequency.

3.9 *inrush current*—The inrush current is a sudden change in line current that occurs during startup or as a result of a change to the operating mode. Inrush current is dependent on the type of load connected to the surge suppressor, and typically will rise to a maximum value in a few milliseconds and decay to rated value in several milliseconds to several seconds.