



Standard Practice for Selection of Wire and Cable Size in AWG or Metric Units¹

This standard is issued under the fixed designation F1883; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This practice is intended as a guide to shipbuilders, shipowners, and design agents for use in the selection of conductor size for single conductor or multiple conductor cable sizes either in American Wire Gauge (AWG) or metric designations for commercial ship design and construction.

1.2 The comparison chart of electrical conductor sizes shown in **Table 1** presents a combined listing of stranded uncoated (plain) copper conductors in accordance with AWG Class B stranding (Specification **B8**) inch-pound units or international standard sizes of Class 2 IEC (Specification IEC 60228) metric units.

1.3 As a precautionary caveat, some conductor sizes listed in **Table 1** may exceed minimal size requirements of the U.S. Coast Guard, the American Bureau of Shipping, and IEEE STD 45 for specific applications.

1.4 The values stated for ampacity and dc resistance are presented as maximum values and are provided for information only.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

B8 Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

B193 Test Method for Resistivity of Electrical Conductor Materials

2.2 IEC Standards:³

IEC 60092-350 Electrical Installations in Ships—Part 350: Shipboard Power: Cables—General Construction and Test Requirements

IEC 60228 Conductors of Insulated Cables

2.3 IEEE Standard:⁴

IEEE STD 45 Recommended Practice for Electric Installations on Shipboard

2.4 NFPA Documents:⁵

NFPA 70 National Electrical Code (NEC)

3. Significance and Use

3.1 The selection criteria is to be applied for uses of (1) new cable and (2) replacement cable.

3.2 For the selection of new cable or the selection of replacement cable, this practice defines the choice criteria for conductor selection for cables in AWG (ASTM) or metric (IEC) sizes.

4. Selection Criteria

4.1 When selecting cable for any application, AWG or metric sizing should be selected according to preferred sizes. The sizes of conductors that have been marked with an asterisk in **Table 1** designate preferred sizes in accordance with Specification **B8** and IEC 60228. Those sizes not marked are given for reference, and it is recommended that their use be discouraged.

4.2 When selecting cable for any application, AWG or metric sizing should be selected with full consideration of the relationship of type of insulation and ampacity. Direct selection between AWG and metric sizes can be made only after a determination of the equivalence of insulation is made.

4.3 When selecting cable, the conductor size will be determined from analysis of required ampacity, voltage drop

¹ This practice 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 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 International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <https://www.iec.ch>.

⁴ Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854-4141, <http://www.ieee.org>.

⁵ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

*A Summary of Changes section appears at the end of this standard