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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Standard Metric Sizes of Electrical Conductors¹

This standard is issued under the fixed designation B 682; 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} NOTE—Section 11 was added editorially in March 1996.

1. Scope

1.1 This specification prescribes the recommended standard metric sizes of solid round electrical conductors.

1.2 This specification prescribes the recommended standard metric size designations of stranded electrical conductors.

NOTE 1—The purpose of this specification is to provide logical geometrically progressive series of sizes for guidance to individuals and organizations preparing hard metric specifications for all types of round wire and stranded electrical conductors (see 3.1). The preferred sizes have been established to avoid proliferation of non-preferred sizes. They provide a series of sizes intended to be acceptable for most applications. The use of metric sizes will depend upon commercial factors, and their existence does not render obsolete existing specifications with inch-pound units as standard. This specification and hard metric conductor specifications prepared in accordance with it are not intended to replace any of the existing specifications having inch-pound units as the standard, with or without the inclusion of soft metric conversion (see 3.1.2).

NOTE 2—Physical properties, construction requirements, and manufacturing tolerances for specific products should be included in individual product specifications developed in accordance with appropriate sizes in this specification.

NOTE 3—Inch-pound units shown in the tables were calculated from the metric values and rounded, and are shown for information only.

2. Referenced Documents

2.1 ASTM Standards:

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications²

¹ This specification is under the jurisdiction of ASTM Committee B-1 on Wires for Electrical Conductors and is the direct responsibility of Subcommittee B01.02 on Methods of Test and Sampling Procedure.

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F 205 Test Method for Measuring Diameter of Fine Wire by Weighing³

2.2 IEC Standards:

IEC 182 Basic Dimensions of Winding Wires⁴

IEC 228 Nominal Cross-Sectional Areas and Composition of Conductors of Insulated Cables⁴

2.3 ISO Standards:

ISO R388 Metric Series for Basic Thickness of Sheet and Diameters of Wire⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *hard metric specification*—a specification for bare, insulated, or covered electrical conductors incorporating SI units as the standard, and including a series of standard sizes differing from those in inch-pound conductor specifications.

3.1.2 *soft metric conversion*—The addition of SI units, converted from U.S. customary units, to a specification for bare, insulated, or covered electrical conductors which includes the inch-pound units as the standard and retains the customary series of standard sizes.

4. Standard Reference Temperature

4.1 For the purpose of this specification, all wire dimensions and properties shall be considered as occurring at the internationally standardized reference temperature of 20°C.

² Annual Book of ASTM Standards, Vol 14.02.

³ Annual Book of ASTM Standards, Vol 10.04.

⁴ International Electrotechnical Commission and International Organization for Standardization documents are available from the American National Standards Institute (ANSI), 11 West 42nd St., 13th Floor, New York, NY 10036.

TABLE 1 Standard Metric Diameters and Cross-Sectional Areas of Solid Round Wires at 20°C

Diameter			Cross-Sectional Area	
mm (R 20 Series)	in. ⁴	mm ²	in. ^{2A}	kcmil ⁴
18.0	0.708 7	254.5	0.394 4	502.2
16.0	0.629 9	201.1	0.311 6	396.8
14.0	0.551 8	153.9	0.238 6	303.8
12.5	0.492 1	122.7	0.190 2	242.2
11.2	0.440 9	98.52	0.152 7	194.4
10.0	0.393 7	78.54	0.121 7	155.0