



Designation: B 263 – 99

Standard Test Method for Determination of Cross-Sectional Area of Stranded Conductors¹

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1. Scope

1.1 This test method covers the procedure for determining the cross-sectional area of stranded conductors by the mass method.

1.2 The values stated in inch-pound or SI units are to be regarded separately as the standard. The values in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

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.*

2. Referenced Documents

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

2.2 *ASTM Standards:*

B 830 Specification for Uniform Test Methods and Frequency²

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *lot, n*—a lot is any amount of stranded conductor of one type and size presented for acceptance at one time.

3.1.2 *sample, n*—a sample is a quantity of production units (reels, spools, coils, etc.) selected at random from the lot for the purpose of determining conformance of the lot to the requirements of this test method.

3.1.3 *specimen, n*—a specimen is a length of stranded conductor removed for test purposes from any individual production unit of the sample.

4. Apparatus

4.1 *Balance*, accurate to 0.1 %.

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

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² *Annual Book of ASTM Standards*, Vol 02.03.

4.2 *Steel Scale*, whose least division is not greater than $\frac{1}{32}$ in. (1 mm).

4.3 *Jig*, or equivalent equipment, for cutting the conductor to length and at right angles to its axis.

5. Sampling

5.1 Samples shall be taken from the outer end of reel or spool lengths, or from either end of coiled lengths.

5.2 Unless otherwise specified by the purchaser at the time of placing the order, a sample shall consist of the number of production units (reels or coils) shown in Table 1 or in accordance with Specification B 830.

6. Test Specimens

6.1 The length of test specimens shall be as follows:

Nominal Size of Test Specimen, cmil (mm ²)	Length of Test Specimen min, ft (mm)
Up to 17 000 (9), incl	4 (1220)
Over 17 000 (9)	2 (610)

7. Procedure

7.1 Cut the test specimen, making sure that the ends are at the right angles to the axis of the conductor.

7.2 Measure the length of the specimen at room temperature (see Note) to the nearest $\frac{1}{32}$ in. (1 mm), and weigh to within ± 0.1 %, converting to pounds (grams) if weighed in other units.

NOTE 1—Correction for temperature variation need not be made, since the error introduced in the length measurement by the temperature variation is less than the required accuracy of the length measurement.

8. Calculation

8.1 Calculate the cross-sectional area of a stranded conductor, composed of only one type of conducting material, as follows:

$$A = (1000/L) \times [100/(100 + k)] \times (W/f)$$

where:

A = cross-sectional area, cmil (mm²),

W = mass of test specimen, lb (g),

L = length of test specimen, ft (mm),

f = mass factor, lb/cmil·1000 ft (g/cm³), (Table 2), and

k = increment (increase) of weight and electrical resistance (from product specifications), percent.