



Designation: B911/B911M – 22

Standard Specification for ACSR Twisted Pair Conductor (ACSR/TP)¹

This standard is issued under the fixed designation B911/B911M; 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 specification covers ACSR Twisted Pair Conductor (ACSR/TP) for use as overhead electric conductors (see **Notes 1 and 2**).

NOTE 1—The conductor is fabricated from two component ACSR conductors of the same size twisted helically around each other. This conductor is identified by the code name of the component ACSR conductor followed by /TP or the size and type of the component ACSR conductor followed by /TP.

NOTE 2—There are registered trademark symbols that are also used to identify the twisted pair notation. Consult cable manufacturers for additional details.

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

1.2.1 For conductor sizes designated by AWG or kcmil, the requirements in SI units have been numerically converted from corresponding values stated or derived in inch-pound units. For conductor sizes designated by SI units only, the requirements are stated or derived in SI units. For density, resistivity, and temperature, the values stated in SI units are to be regarded as standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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.*

¹ This specification is under the jurisdiction of ASTM Committee B01 on Electrical Conductors and is the direct responsibility of Subcommittee B01.07 on Conductors of Light Metals.

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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 *ASTM Standards*:²

B232/B232M Specification for Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR)

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *component conductors*—the two conductors twisted to fabricate the finished ACSR/TP.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Quantity of each size,

4.1.1.1 *Conductor Size*—kcmil area of the fabricated ACSR/TP (2 × kcmil area of one of the component conductors),

4.1.2 Conductor type and the number of wires of the component conductors,

4.1.3 The type of steel core wire and type of coating,

4.1.4 Place of inspection,

4.1.5 Package size and type,

4.1.6 Special package markings, if required, and

4.1.7 Heavy wood lagging, if required.

5. Requirements for Component Conductors

5.1 Before twisting, the component conductors shall conform to the requirements of Specification **B232/B232M**.

6. Twist

6.1 The component conductors shall be twisted about themselves with a complete twist every 9 ft ± 1 ft. This twist length shall be measured between the twisting machine and the take-up reel with normal take-up tension on the ACSR/TP.

NOTE 3—The twist length can be altered as the ACSR/TP is wound up

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.



onto the take-up reel. It may not have the same twist length as when the TP is removed from the reel.

6.2 The direction of the twist shall be left hand.

7. Construction Requirements

7.1 Construction requirements are given in Table 1 for ACSR/TP.

7.2 The twisted pair components shall be continuous throughout the reel. No joints in the finished component conductors are allowed.

7.3 The major and minor dimensions of the conductor shall be defined as indicated in Fig. 1.

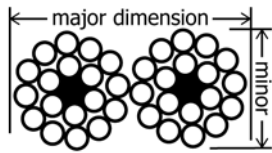


FIG. 1 Dimensions

8. Rated Strength of TP Conductor

8.1 The rated strength of a completed ACSR/TP conductor shall be two times the rated strength of one of the component stranded conductors as given in Specification B232/B232M.

9. Mass Per Unit Length

9.1 The mass per unit length of a completed ACSR/TP conductor shall be two times the mass per unit length of one of the component conductors as given in Specification B232/B232M.

10. Workmanship, Finish, and Appearance

10.1 The conductor shall be free of all imperfections not consistent with good commercial practice.

11. Mechanical and Electrical Tests

11.1 Tests for the electrical and mechanical properties shall be made on the component conductors as required in the appropriate ASTM Specifications.

11.2 Tests for the demonstration of rated strength of the completed ACSR/TP conductor are not required by this specification but may be made if agreed upon between the manufacturer and the purchaser at the time of placing an order. If tested, the breaking strength of the completed ACSR/TP shall be determined by performing a breaking test of each of the component conductors before twisting as given in the appropriate component conductor's ASTM Specification. The breaking strength of the completed ACSR/TP shall be two times the breaking strength of the component conductor that had the lowest breaking strength.

11.3 The critical aspect of ACSR/TP conductor is that the component conductors be of equal length and tension in the completed ACSR/TP. To test for this condition during the

twisting process a mark (using felt tip pin or spray paint) is to be made at the same longitudinal location on each of the component conductors before the component conductors have passed through the twisting process. These two marks shall be observed and followed visually during the twisting and to the take-up reel. If the marks move back and forth relative to each other less than 1.5 in. [3.8 cm] the component tensions and lengths shall be considered equal and the ACSR/TP is acceptable. If one mark moves steadily away from the other mark the component tensions and lengths shall be considered unequal and twisting machine adjustments must be made and another marking test made. This marking test is to be made in the first 100 ft [30 m] of each reel of ACSR/TP produced. If component tensions cannot be adjusted equally after three tries, 300 ft [90 m], the completed ACSR/TP is to be scrapped, tension adjustments made, and the production started over.

12. Inspection

12.1 Unless otherwise specified in the contract or purchase order, the manufacturer shall be responsible for the performance of all inspection and test requirements specified.

12.2 All inspections and tests shall be made at the place of manufacture unless otherwise agreed upon between the manufacturer and the purchaser at the time of the purchase.

12.3 The manufacturer shall afford the inspector representing the purchaser all reasonable manufacturer's facilities to satisfy him that the material is being furnished in accordance with this specification.

13. Packaging and Package Marking

13.1 Package sizes and kind of package, reels or coils, shall be agreed upon between the manufacturer and the purchaser.

13.2 There shall be only one length of conductor on a reel.

13.3 The conductor shall be protected against damage in ordinary handling and shipping. If heavy wood lagging is required, the purchaser shall specify it at the time of placing the purchase order.

13.4 The net mass, length, size, kind of conductor, stranding, type of core coating, if any, and any other necessary identification shall be marked on a tag attached to the end of the conductor inside the package. This same information, together with the purchase order number, the manufacturer's serial number (if any) and all shipping marks and other information required by the purchaser shall appear on the outside of the package.

14. Keywords

14.1 aeolian vibration; aluminum; aluminum conductor; ACSR; electrical conductors; galloping; overhead conductors; steel-reinforced conductors; stranded aluminum conductors; TP; twisted pair