Designation: ~~B711 – 12~~ B711 – 13

Standard Specification for Concentric-Lay-Stranded Aluminum-Alloy Conductors, Steel Reinforced (AACSR) (6201)[1]

This standard is issued under the fixed designation B711; 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 concentric-lay-stranded conductors made from round aluminum-alloy 6201-T81 hard: solution heat treated, cold worked, and then artificially aged wire and round zinc-coated, Zn-5Al-MM coated, aluminum-coated, or aluminum-clad steel core wire for use as overhead electric conductors (Explanatory Note 1 and Note 2).

NOTE 1—The alloy and temper designations conform to ANSI H35.1. Aluminum alloy 6201 corresponds to Unified Numbering System alloy A96201 in accordance with Practice E527.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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 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 specification to the extent referenced herein.

2.2 *ASTM Standards:*[2]

B263 Test Method for Determination of Cross-Sectional Area of Stranded Conductors

~~B341/B341M Specification for Aluminum-Coated (Aluminized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR/AZ) (Withdrawn 2007)~~[3]

B354 Terminology Relating to Uninsulated Metallic Electrical Conductors

B398/B398M Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes

B498/B498M Specification for Zinc-Coated (Galvanized) Steel Core Wire for Use in Overhead Electrical Conductors

B500/B500M Specification for Metallic Coated or Aluminum Clad Stranded Steel Core for Use in Overhead Electrical Conductors

B502 Specification for Aluminum-Clad Steel Core Wire for Use in Overhead Electrical Aluminum Conductors

B606 Specification for High-Strength Zinc-Coated (Galvanized) Steel Core Wire for Aluminum and Aluminum-Alloy Conductors, Steel Reinforced

B802/B802M Specification for Zinc–5 % Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR)

B803 Specification for High-Strength Zinc–5 % Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Use in Overhead Electrical Conductors

B957 Specification for Extra-High-Strength and Ultra-High-Strength Zinc-Coated (Galvanized) Steel Core Wire for Overhead Electrical Conductors

B958 Specification for Extra-High-Strength and Ultra-High-Strength Class A Zinc–5% Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Use in Overhead Electrical Conductors

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

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[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] 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.

2.3 *American National Standards Institute Standard:*
H35.1M Alloy and Temper Designation Systems for Aluminum[3]
2.4 *Other Standards:*
NBS Handbook 100—Copper Wire Tables[4]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*
3.1.1 *AACSR*—covered by this specification has five types of coated steel and one type of aluminum-clad steel core wire which are designated by abbreviations as follows (Explanatory Note 1 and Note 9):
3.1.1.1 *AACSR/GA2-AACSR*—using Class A zinc-coated steel wire in accordance with Specification B498/B498M.
3.1.1.2 *AACSR/GC2-AACSR*—using Class C zinc-coated steel wire in accordance with Specification B498/B498M.
3.1.1.3 *AACSR/GA3-AACSR*—using high-strength steel wire in accordance with Specification B606.
3.1.1.4 *AACSR/GA4-AACSR*—using extra-high-strength steel wire in accordance with Specification B957.
3.1.1.5 *AACSR/GA5-AACSR*—using ultra-high-strength steel wire in accordance with Specification B957.
3.1.1.6 *AACSR/AW2-AACSR*—using aluminum-clad steel wire, normal strength in accordance with Specification B502.
3.1.1.7 *AACSR/AW3-AACSR*—using aluminum-clad steel wire, high strength in accordance with Specification B502.
3.1.1.8 *AACSR/MA2*—using Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B802/B802M.
3.1.1.9 *AACSR/MC2*—using Zn-5Al-MM coated steel core wire, coating Class C in accordance with Specification B802/B802M.
3.1.1.10 *AACSR/MA3*—using high-strength Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B803.
3.1.1.11 *AACSR/MA4*—using extra-high-strength Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B958).
3.1.1.12 *AACSR/AZ-MA5*—using ultra-high-strength Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B958.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:
4.1.1 Quantity of each size and stranding,
4.1.2 Conductor size, square millimetres (Section 8 and Table 1);
4.1.3 Number of wires, aluminum and steel;
4.1.4 Type of steel core wire and, if galvanized or Zn-5Al-MM coated, class ~~(A, B,~~ (A or C) of coating (see 5.2);
4.1.5 Direction of lay of outer layer of aluminum wires if other than right-hand (see 7.2);
4.1.6 Special tension test, if required (see 9.2);
4.1.7 Place of inspection (Section 15);
4.1.8 Special package marking, if required (Section 16);
4.1.9 Package size (see 17.1); and
4.1.10 Heavy wood lagging, if required (see 17.3).

5. Requirement for Wires

5.1 Before stranding, the aluminum-alloy wire shall meet the requirements of Specification B398/B398M.

5.2 Before stranding, the steel core wire shall meet the requirements of ~~Specification~~Specifications ~~B341/B341M,~~ ~~B498/B498M~~, B502, B606, B802/B802M, ~~or~~ ~~B803~~, B957 or B958, whichever is applicable.

5.3 Steel core supplied in a stranded construction shall meet the requirements of Specification B500/B500M, if applicable.

6. Joints

6.1 Cold-pressure welds, electric-butt welds, and electric-butt, cold-upset welds in the finished individual aluminum alloy wires composing the conductor may be made during the stranding process. Following welding, electric-butt welds shall be annealed for a distance of at least 150 mm on each side of the weld. No weld shall occur within 15 m of a weld in the same wire or in any other wire of the completed conductor (Explanatory Note 3).

6.2 There shall be no joints made in the finished steel wires.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.
[4] Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 3460, Gaithersburg, MD 20899-3460.

TABLE 1 Construction Requirements of Aluminum-Alloy Conductors, Steel Reinforced, Concentric-Lay-Stranded

Conductor Area, mm^2			Stranding[A] and Wire Diameter				Diameter, mm		Rated Strength[B]	Mass[C]
Alloy Nominal	Steel	Total	Alloy		Steel		Conductor	Steel Core		
			Number	mm	Number	mm			kN	kg/km
1250	102	1352	84	4.35	19	2.61	47.8	13.0	490	4255
1120	91	1211	84	4.12	19	2.47	45.3	12.4	439	3816
1250	102	1352	84	4.35	19	2.61	47.8	13.0	489	4255
1120	91	1211	84	4.12	19	2.47	45.3	12.4	437	3816
1000	81	1081	84	3.89	19	2.33	42.8	11.6	391	3400
900	73	973	84	3.69	19	2.21	40.6	11.0	355	3060
1000	81	1081	84	3.89	19	2.33	42.8	11.6	389	3400
900	73	973	84	3.69	19	2.21	40.6	11.0	353	3060
800	101	901	54	4.34	19	2.60	39.0	13.0	363	3003
710	90	800	54	4.09	19	2.45	36.8	12.2	322	2664
800	101	901	54	4.34	19	2.60	39.0	13.0	361	3003
710	90	800	54	4.09	19	2.45	36.8	12.2	321	2664
630	80	710	54	3.85	19	2.31	34.6	11.6	286	2365
560	71	631	54	3.63	19	2.18	32.7	10.9	257	2104
630	80	710	54	3.85	19	2.31	34.6	11.6	285	2365
560	71	631	54	3.63	19	2.18	32.7	10.9	256	2104
500	63	563	54	3.43	19	2.06	30.9	10.3	229	1878
450	59	509	54	3.26	19	1.98	29.5	9.90	215	1706
500	63	563	54	3.43	19	2.06	30.9	10.3	228	1878
450	59	509	54	3.26	19	1.98	29.5	9.90	208	1706
400	91	491	30	4.12	19	2.47	28.8	12.4	237	1818
400	65	465	26	4.43	7	3.45	28.1	10.4	207	1616
400	91	491	30	4.12	19	2.47	28.8	12.4	237	1818
400	65	465	26	4.43	7	3.45	28.1	10.4	206	1616
355	81	436	30	3.88	19	2.33	27.2	11.6	211	1614
355	58	413	26	4.17	7	3.24	26.4	9.72	183	1430
355	81	436	30	3.88	19	2.33	27.2	11.6	210	1614
355	58	413	26	4.17	7	3.24	26.4	9.72	182	1430
315	72	387	30	3.66	19	2.20	25.6	11.0	190	1438
315	52	367	26	3.93	7	3.06	24.9	9.18	163	1272
315	72	387	30	3.66	19	2.20	25.6	11.0	190	1438
315	52	367	26	3.93	7	3.06	24.9	9.18	162	1272
280	65	345	30	3.45	7	3.45	24.2	10.4	171	1286
280	46	326	26	3.70	7	2.88	23.4	8.64	144	1127
250	58	308	30	3.26	7	3.26	22.8	9.78	156	1149
250	41	291	26	3.50	7	2.72	22.2	8.16	129	1008
250	58	308	30	3.26	7	3.26	22.8	9.78	152	1149
250	41	291	26	3.50	7	2.72	22.2	8.16	128	1008
224	52	276	30	3.08	7	3.08	21.6	9.24	139	1025
224	36	260	26	3.31	7	2.57	21.0	7.71	118	901
224	52	276	30	3.08	7	3.08	21.6	9.24	139	1025
224	36	260	26	3.31	7	2.57	21.0	7.71	115	901
200	47	247	30	2.91	7	2.91	20.4	8.73	124	915
200	32	232	26	3.13	7	2.43	19.8	7.29	106	805
200	47	247	30	2.91	7	2.91	20.4	8.73	124	915
200	32	232	26	3.13	7	2.43	19.8	7.29	105	805
180	42	222	30	2.76	7	2.76	19.3	8.28	112	823
180	29	209	26	2.97	7	2.31	18.8	6.93	95.1	731
180	42	222	30	2.76	7	2.76	19.3	8.28	112	823
180	29	209	26	2.97	7	2.31	18.8	6.93	195.0	731
160	38	198	30	2.61	7	2.61	18.3	7.83	106	736
160	26	186	26	2.80	7	2.18	17.7	6.54	85.6	646
160	38	198	30	2.61	7	2.61	18.3	7.83	100	736
160	26	186	26	2.80	7	2.18	17.7	6.54	85.5	646
140	33	173	30	2.44	7	2.44	17.1	7.32	87.4	643
140	23	163	26	2.62	7	2.04	16.6	6.12	75.0	565
140	33	173	30	2.44	7	2.44	17.1	7.32	87.4	643
140	23	163	26	2.62	7	2.04	16.6	6.12	74.9	565