Designation: B 711 – 99

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

This standard is issued under the fixed designation B 711; 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—All values are stated in SI units. No inch-pound equivalents are presented, nor is an inch-pound companion specification proposed.

NOTE 2—The alloy and temper designations conform to ANSI H35.1. Aluminum alloy 6201 corresponds to Unified Numbering System alloy A96201 in accordance with Practice E 527.

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:*

B 263 Test Method for Determination of Cross-Sectional Area of Stranded Conductors[2]

B 341 Specification for Aluminum-Coated (Aluminized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR/AZ)[2]

B 354 Terminology Relating to Uninsulated Metallic Electrical Conductors[2]

B 398 Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes[2]

B 398M Specification for Aluminum-Alloy 6201-T81 Wire for Electrical Purposes [Metric][2]

B 498M Specification for Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR) [Metric][2]

B 500 Specification for Metallic Coated Stranded Steel Core for Aluminum Conductors, Steel Reinforced (ACSR)[2]

B 502 Specification for Aluminum-Clad Steel Core Wire for Aluminum Conductors, Aluminum-Clad Steel Reinforced[2]

B 606 Specification for High-Strength Zinc-Coated (Galvanized) Steel Core Wire for Aluminum and Aluminum-Alloy Conductors, Steel Reinforced[2]

B 802M Specification for Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR) [Metric][2]

B 803 Specification for High-Strength Zinc-5% Aluminum-Mischmetal Alloy-Coated Steel Core Wire for Aluminum and Aluminum-Alloy Conductors, Steel Reinforced[2]

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications[3]

E 527 Practice for Numbering Metals and Alloys (UNS)[4]

2.3 *American National Standards Institute Standard:*

H35.1M Alloy and Temper Designation Systems for Aluminum[5]

2.4 *Other Standard:*

NBS Handbook 100—Copper Wire Tables[6]

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 2):

3.1.1.1 *AACSR/GA-AACSR*—using Class A zinc-coated steel wire (B 498).

3.1.1.2 *AACSR/GB-AACSR*—using Class B zinc-coated steel wire (B 498).

3.1.1.3 *AACSR/GC-AACSR*—using Class C zinc-coated steel wire (B 498).

3.1.1.4 *AACSR/AZ-AACSR*—using aluminum-coated (aluminized) steel wire (B 341).

3.1.1.5 *AACSR/HS-AACSR*—using extra high-strength steel wire (B 606).

3.1.1.6 *AACSR/AW-AACSR*—using aluminum-clad steel wire (B 502).

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

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

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 01.01.

[5] Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.

[6] Available from National Institute of Standards and Technology, (NIST), Gaithersburg, MD 20899.

3.1.1.7 *AACSR/MA*—using Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B B 802M.

3.1.1.8 *AACSR/MB*—using Zn-5Al-MM coated steel core wire, coating Class B in accordance with Specification B 802M.

3.1.1.9 *AACSR/MC*—using Zn-5Al-MM coated steel core wire, coating Class C in accordance with Specification B 802M.

3.1.1.10 *AACSR/MC*—using high-strength Zn-5Al-MM coated steel core wire, coating Class A in accordance with Specification B 803.

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, 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 B 398M.

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
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
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
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
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
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
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
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
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
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
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
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
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
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

[A] Only those strandings with a relatively high steel content are listed. Other strandings are available by agreement between the purchaser and the producer.
[B] Rated strengths are for AACSR/GA and AACSR/MA conductors. Strengths were calculated in accordance with 9.1.
[C] Mass applies to AACSR/GA, AACSR/MA, and AACSR/AZ conductors.