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Designation: B179 – 11

StandardSpecification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes[1]

This standard is issued under the fixed designation B179; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers commercial aluminum alloys in ingot form for remelting and molten form for the manufacture of castings. The specific gravity of these alloys does not exceed 3.0 and they are designated as shown in Table 1.

NOTE 1—Throughout this specification the use of "ingot" in a general sense includes sow, T-bar, T-ingot, and pig.

1.2 Alloy designations are in accordance with ANSI H35.1/H35.1(M). The equivalent Unified Numbering System alloy designations are in accordance with Practice E527.

NOTE 2—Supplementary data pertaining to the alloys covered by this specification when used in the form of castings are given in Specifications B26/B26M, B85/B85M, B108/B108M, B618/B618M, B686/B686M, and B955/B955M.

1.3 Unless the order specifies the "M" specification designation, the material shall be furnished to the inch-pound units.

1.4 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A1.

1.5 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

1.5.1 *Exception*—Certain SI units appear in brackets in 7.1.2.

1.6 *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 *ASTM Standards:*[2]

B26/B26M Specification for Aluminum-Alloy Sand Castings
B85/B85M Specification for Aluminum-Alloy Die Castings
B108/B108M Specification for Aluminum-Alloy Permanent Mold Castings
B618/B618M Specification for Aluminum-Alloy Investment Castings
B666/B666M Practice for Identification Marking of Aluminum and Magnesium Products
B686/B686M Specification for Aluminum Alloy Castings, High-Strength
B955/B955M Specification for Aluminum-Alloy Centrifugal Castings
B969 Specification for Aluminum-Alloy Castings Produced by the Squeeze Casting, Thixocast and Rheocast Semi-Solid Casting Processes
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys
E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)
E607 Test Method for Atomic Emission Spectrometric Analysis Aluminum Alloys by the Point to Plane Technique Nitrogen Atmosphere (Withdrawn 2011)[3]
E716 Practices for Sampling and Sample Preparation of Aluminum and Aluminum Alloys for Determination of Chemical Composition by Spectrochemical Analysis

[1] This specification is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.01 on Aluminum Alloy Ingots and Castings.

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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.

[3] The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard

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TABLE 1 Chemical Composition Limits of Aluminum Alloys in Ingot and Molten Forms for All Casting Processes[A,B]
This Table has been reprinted by the permission of the Aluminum Association, Inc.
Only composition limits which are identical to those listed herein or are registered with the Aluminum Association should be designated as "AA" alloys.

NOTE 1—Where single units are shown, these indicate the maximum amounts permitted.

NOTE 2—Analysis shall be made for those elements for which limits are shown in this table.

NOTE 3—The following applies to all specified limits in the table: For purposes of acceptance or rejection an observed value or a calculated value obtained from analysis should be rounded to the nearest unit in the last right-hand place of figures used in expressing the specified limit in accordance with the rounding-off method of Practice E29.

Registered Alloys in the Form of XXX.1 Ingot and XXX.2 Ingot

Designation		Registered Date	Products[C]	Composition, %													
AA No.	Former			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Sn	Others[D] Each	Others[D] Total[E]	Aluminum Minimum
100.1*	...	06/30/70	Ingot	0.15	0.6-0.8	0.10	...[F]	...	...[F]	...	0.05	...[F]	...	0.03[F]	0.10	99.00[G]
130.1*	...	06/30/70	Ingot	...[H]	...[H]	0.10	...[F]	...	...[F]	...	0.05	...[F]	...	0.03[F]	0.10	99.30[G]
150.1*	...	06/30/70	Ingot	...[I]	...[I]	0.05	...[F]	...	...[F]	...	0.05	...[F]	...	0.03[F]	0.10	99.50[G]
160.1	...	01/28/76	Ingot	0.10[I]	0.25[I]	...	...[F]	...	...[F]	...	0.05	...[F]	...	0.03[F]	0.10	99.60[G]
170.1*	...	06/30/70	Ingot	...[J]	...[J]	...	...[F]	...	...[F]	...	0.05	...[F]	...	0.03[F]	0.10	99.70[G]
201.2	...	04/17/68	Ingot	0.10	0.10	4.0-5.2	0.20-0.50	0.20-0.55	...	...	...	0.15-0.35	...	0.05[K]	0.10	Remainder
A201.1	A201.2	10/09/70	Ingot	0.05	0.07	4.0-5.0	0.20-0.40	0.20-0.35	...	...	...	0.15-0.35	...	0.03[K]	0.10	Remainder
203.2	Hiduminium 350	12/02/72	Ingot	0.20	0.35	4.8-5.2	0.20-0.30	0.10	...	1.3-1.7	0.10	0.15-0.25	...	0.05[L]	0.20	Remainder
204.2	A-U5GT	10/01/74	Ingot	0.15	0.10-0.20	4.2-4.9	0.05	0.20-0.35	...	0.03	0.05	0.15-0.25	0.05	0.05	0.15	Remainder
206.2	...	04/23/76	Ingot	0.10	0.10	4.2-5.0	0.20-0.50	0.20-0.35	...	0.03	0.05	0.15-0.25	0.05	0.05	0.15	Remainder
A206.2	...	04/23/76	Ingot	0.05	0.07	4.2-5.0	0.20-0.50	0.20-0.35	...	0.03	0.05	0.15-0.25	0.05	0.05	0.15	Remainder
B206.2	...	07/07/03	Ingot	0.05	0.07	4.2-5.0	0.20-0.50	0.20-0.35	...	0.03	0.05	0.05	0.05	0.05	0.15	Remainder
240.1	A240.1, A140	...	Ingot	0.50	0.40	7.0-9.0	0.30-0.7	5.6-6.5	...	0.30-0.7	0.10	0.20	...	0.05	0.15	Remainder
242.1	142	...	Ingot	0.7	0.8	3.5-4.5	0.35	1.3-1.8	0.25	1.7-2.3	0.35	0.25	...	0.05	0.15	Remainder
242.2	142	...	Ingot	0.6	0.6	3.5-4.5	0.10	1.3-1.8	...	1.7-2.3	0.10	0.20	...	0.05	0.15	Remainder
A242.1	A142	...	Ingot	0.6	0.6	3.7-4.5	0.10	1.3-1.7	0.15-0.25	1.8-2.3	0.10	0.07-0.20	...	0.05	0.15	Remainder
A242.2	A142	...	Ingot	0.35	0.6	3.7-4.5	0.10	1.3-1.7	0.15-0.25	1.8-2.3	0.10	0.07-0.20	...	0.05	0.15	Remainder
295.1	195	...	Ingot	0.7-1.5	0.8	4.0-5.0	0.35	0.03	...	...	0.35	0.25	...	0.05	0.15	Remainder
295.2	195	...	Ingot	0.7-1.2	0.8	4.0-5.0	0.30	0.03	...	...	0.30	0.20	...	0.05	0.15	Remainder
296.1	B295.1, B195	...	Ingot	2.0-3.0	0.9	4.0-5.0	0.35	0.05	...	0.35	0.50	0.25	...	...	0.35	Remainder
296.2	B295.2, B195	...	Ingot	2.0-3.0	0.8	4.0-5.0	0.30	0.03	...	...	0.30	0.20	...	0.05	0.15	Remainder
301.1[M]	....	08/02/94	Ingot[N]	9.5-10.5	0.8-1.2	3.0-3.5	0.50-0.8	0.30-0.50	...	1.0-1.5	0.05	0.20	...	0.03	0.10	Remainder

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TABLE 1 *Continued*

Designation		Registered Date	Products[C]	Composition, %												
AA No.	Former			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Sn	Others[D] Each	Others[D] Total[E]	Aluminum Minimum
302.1[M]	....	08/02/94	Ingot[N]	9.5-10.5	0.20	2.8-3.2	...	0.8-1.2	...	1.0-1.5	0.05	0.20	...	0.03	0.10	Remainder
303.1[M]	....	08/02/94	Ingot[N]	9.5-10.5	0.8-1.2	0.20	0.50-0.8	0.50-0.7	...	...	0.05	0.20	...	0.03	0.10	Remainder
308.1[M]	A108	...	Ingot	5.0-6.0	0.8	4.0-5.0	0.50	0.10	...	...	1.0	0.25	...	...	0.50	Remainder
308.2[M]	A108	...	Ingot	5.0-6.0	0.8	4.0-5.0	0.30	0.10	...	...	0.50	0.20	...	...	0.50	Remainder
318.1[M]	...	01/29/91	Ingot	5.5-6.5	0.8	3.0-4.0	0.50	0.15-0.6	...	0.35	0.9	0.25	...	...	0.50	Remainder
319.1[M]	319, All Cast	...	Ingot	5.5-6.5	0.8	3.0-4.0	0.50	0.10	...	0.35	1.0	0.25	...	...	0.50	Remainder
319.2[M]	319, All Cast	...	Ingot	5.5-6.5	0.6	3.0-4.0	0.10	0.10	...	0.10	0.10	0.20	...	...	0.20	Remainder
A319.1[M]	...	08/28/70	Ingot	5.5-6.5	0.8	3.0-4.0	0.50	0.10	...	0.35	3.0	0.25	...	...	0.50	Remainder
B319.1[M]	...	10/30/81	Ingot	5.5-6.5	0.9	3.0-4.0	0.8	0.15-0.50	...	0.50	1.0	0.25	...	...	0.50	Remainder
320.1[M]	...	04/08/82	Ingot	5.0-8.0	0.9	2.0-4.0	0.8	0.10-0.6	...	0.35	3.0	0.25	...	...	0.50	Remainder Remainder
328.1[M]	Red X-8	...	Ingot	7.5-8.5	0.8	1.0-2.0	0.20-0.6	0.25-0.6	0.35	0.25	1.5	0.25	...	...	0.50	Remainder
332.1[M]	F332.1, F132	...	Ingot	8.5-10.5	0.9	2.0-4.0	0.50	0.6-1.5	...	0.50	1.0	0.25	...	...	0.50	Remainder
332.2[M]	F332.2, F132	...	Ingot	8.5-10.0	0.6	2.0-4.0	0.10	0.9-1.3	...	0.10	0.10	0.20	...	...	0.30	Remainder
333.1[M]	333	...	Ingot	8.0-10.0	0.8	3.0-4.0	0.50	0.10-0.50	...	0.50	1.0	0.25	...	...	0.50	Remainder
A333.1[M]	...	08/28/70	Ingot	8.0-10.0	0.8	3.0-4.0	0.50	0.10-0.50	...	0.50	3.0	0.25	...	...	0.50	Remainder
336.1[M]	A332.1, A132	....	Ingot	11.0-13.0	0.9	0.50-1.5	0.35	0.8-1.3	...	2.0-3.0	0.35	0.25	...	0.05	...	Remainder
336.2[M]	A332.2, A132	....	Ingot	11.0-13.0	0.9	0.50-1.5	0.10	0.9-1.3	...	2.0-3.0	0.10	0.20	...	0.05	0.15	Remainder
339.1[M]	Z332.1, Z132	...	Ingot	11.0-13.0	0.9	1.5-3.0	0.50	0.6-1.5	...	0.50-1.5	1.0	0.25	...	...	0.50	Remainder
354.1[M]	354	...	Ingot	8.6-9.4	0.15	1.6-2.0	0.10	0.45-0.6	...	...	0.10	0.20	...	0.05	0.15	Remainder
354.2[M]		07/21/97	Ingot	8.6-9.4	0.06	1.6-2.0	0.10	0.45-0.6	...	...	0.10	0.20	...	0.05	0.15	Remainder
355.1[M]	355	...	Ingot	4.5-5.5	0.50[O]	1.0-1.5	0.50[O]	0.45-0.6	0.25	...	0.35	0.25	...	0.05	0.15	Remainder
355.2[M]	355	...	Ingot	4.5-5.5	0.14-0.25	1.0-1.5	0.05	0.50-0.6	...	...	0.05	0.20	...	0.05	0.15	Remainder
A355.2[M]	...	09/17/81	Ingot	4.5-5.5	0.06	1.0-1.5	0.03	0.50-0.6	...	...	0.03	0.04-0.20	...	0.03	0.10	Remainder
C355.1[M]	...	06/04/74	Ingot	4.5-5.5	0.15	1.0-1.5	0.10	0.45-0.6	...	...	0.10	0.20	...	0.05	0.15	Remainder
C355.2[M]	C355	...	Ingot	4.5-5.5	0.13	1.0-1.5	0.05	0.50-0.6	...	...	0.05	0.20	...	0.05	0.15	Remainder
356.1[M]	356	...	Ingot	6.5-7.5	0.50[O]	0.25	0.35[O]	0.25-0.45	...	...	0.35	0.25	...	0.05	0.15	Remainder
356.2[M]	356	...	Ingot	6.5-7.5	0.13-0.25	0.10	0.05	0.30-0.45	...	...	0.05	0.20	...	0.05	0.15	Remainder
A356.1[M]	...	06/04/74	Ingot	6.5-7.5	0.15	0.20	0.10	0.30-0.45	...	...	0.10	0.20	...	0.05	0.15	Remainder
A356.2[M]	A356	...	Ingot	6.5-7.5	0.12	0.10	0.05	0.30-0.45	...	...	0.05	0.20	...	0.05	0.15	Remainder

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TABLE 1 *Continued*

Designation		Registered Date	Products[C]	Composition, %												
AA No.	Former			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Sn	Others[D] Each	Others[D] Total[E]	Aluminum Minimum
B356.2[M]	...	09/17/81	Ingot	6.5-7.5	0.06	0.03	0.03	0.30-0.45	...	...	0.03	0.04-0.20	...	0.03	0.10	Remainder
C356.2[M]	...	05/30/85	Ingot	6.5-7.5	0.04	0.03	0.03	0.30-0.45	...	...	0.03	0.04-0.20	...	0.03	0.10	Remainder
F356.2[M]	...	10/20/71	Ingot	6.5-7.5	0.12	0.10	0.05	0.17-0.25	...	...	0.05	0.04-0.20	...	0.05	0.15	Remainder
357.1[M]	357	...	Ingot	6.5-7.5	0.12	0.05	0.03	0.45-0.6	...	...	0.05	0.20	...	0.05	0.15	Remainder
A357.2[M]	A357	...	Ingot	6.5-7.5	0.12	0.10	0.05	0.45-0.7	...	...	0.05	0.04-0.20	...	0.03[P]	0.10	Remainder
B357.2[M]	...	09/17/81	Ingot	6.5-7.5	0.06	0.03	0.03	0.45-0.6	...	...	0.03	0.04-0.20	...	0.03	0.10	Remainder
C357.2[M]	...	09/17/81	Ingot	6.5-7.5	0.06	0.03	0.03	0.50-0.7	...	...	0.03	0.04-0.20	...	0.03[P]	0.10	Remainder
E357.1[M]	...	06/06/01	Ingot	6.5-7.5	0.07	...	0.10	0.6-0.7	...	...	...	0.10-0.20	...	0.05[Q]	0.15	Remainder
E357.2[M]	...	06/06/01	Ingot	6.5-7.5	0.07	...	0.10	0.6-0.7	...	...	...	0.10-0.20	...	0.05[R]	0.15	Remainder
F357.1[M]	...	06/06/01	Ingot	6.5-7.5	0.07	0.20	0.10	0.45-0.7	...	...	0.10	0.04-0.20	...	0.05[Q]	0.15	Remainder
F357.2[M]	...	06/06/01	Ingot	6.5-7.5	0.07	0.20	0.10	0.45-0.7	...	...	0.10	0.04-0.20	...	0.05[R]	0.15	Remainder
358.2[M]	B358.2, Tens-50	...	Ingot	7.6-8.6	0.20	0.10	0.10	0.45-0.6	0.05	...	0.10	0.12-0.20	...	0.05[S]	0.15	Remainder
359.2[M]	359	...	Ingot	8.5-9.5	0.12	0.10	0.10	0.55-0.7	...	...	0.10	0.20	...	0.05	0.15	Remainder
A359.1[M]	....	08/02/94	Ingot[N]	8.5-9.5	0.20	0.20	0.10	0.45-0.6	...	...	0.05	0.20	...	0.03	0.10	Remainder
360.2[M]	360	...	Ingot	9.0-10.0	0.7-1.1	0.10	0.10	0.45-0.6	...	0.10	0.10	...	0.10	...	0.20	Remainder
A360.1[T,M]	A360	...	Ingot	9.0-10.0	1.0	0.6	0.35	0.45-0.6	...	0.50	0.40	...	0.15	...	0.25	Remainder
A360.2[M]	A360	...	Ingot	9.0-10.0	0.6	0.10	0.05	0.45-0.6	...	...	0.05	...	...	0.05	0.15	Remainder
361.1[M]	...	06/30/78	Ingot	9.5-10.5	0.8	0.50	0.25	0.45-0.6	0.20-0.30	0.20-0.30	0.40	0.20	0.10	0.05	0.15	Remainder
363.1[M]	363	01/16/70	Ingot	4.5-6.0	0.8	2.5-3.5	...[U]	0.20-0.40	...[U]	0.25	3.0-4.5	0.20	0.25	...[V]	0.30	Remainder
364.2[M]	364	...	Ingot	7.5-9.5	0.7-1.1	0.20	0.10	0.25-0.40	0.25-0.50	0.15	0.15	...	0.15	0.05[W]	0.15	Remainder
365.1[M]	Silafont-36	01/05/96	Ingot	9.5-11.5	0.12	0.03	0.50-0.8	0.15-0.50	...	...	0.07	0.04-0.15	...	0.03[X]	0.10	Remainder
A365.1[M]	Aural 2	10/17/08	Ingot	9.5-11.5	0.15-0.20	0.02	0.30-0.6	0.15-0.6	...	...	0.03	0.10	...	0.05[Y]	0.15	Remainder
366.1[M]	...-	03/27/03	Ingot[Z]	6.5-7.5	0.12	0.05	0.03	0.6-1.2	...	...	0.05	0.20	...	0.05	0.15	Remainder
367.1[M]	Mercalloy367	10/01/07	Ingot	8.5–9.5	0.20	0.25	0.25–0.35	0.35–0.50	...	...	0.10	0.20	...[AA]	0.05	0.15	Remainder
368.1[M]	Mercalloy366	10/01/07	Ingot	8.5–9.5	0.20	0.25	0.25–0.35	0.15–0.30	...	...	0.10	0.20	...[AA]	0.05	0.15	Remainder
369.1[M]	Special K-9	04/04/78	Ingot	11.0-12.0	1.0	0.50	0.35	0.30-0.45	0.30-0.40	0.05	0.9	...	0.10	0.05	0.15	Remainder
380.2[M]	380	...	Ingot	7.5-9.5	0.7-1.1	3.0-4.0	0.10	0.10	...	0.10	0.10	...	0.10	...	0.20	Remainder

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