



# Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes<sup>1</sup>

This standard is issued under the fixed designation B 179; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

*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 **E 527**.

NOTE 2—Supplementary data pertaining to the alloys covered by this specification when used in the form of castings are given in Specifications **B 26/B 26M**, **B 85**, **B 108**, **B 618**, and **B 686**.

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

1.4 The values stated in inch-pound units are to be regarded as the standard.

1.5 *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:*<sup>2</sup>

**B 26/B 26M** Specification for Aluminum-Alloy Sand Castings

**B 85** Specification for Aluminum-Alloy Die Castings

**B 108** Specification for Aluminum-Alloy Permanent Mold Castings

<sup>1</sup> 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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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

**B 618** Specification for Aluminum-Alloy Investment Castings

**B 666/B 666M** Practice for Identification Marking of Aluminum and Magnesium Products

**B 686** Specification for Aluminum Alloy Castings, High-Strength

**E 29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

**E 34** Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys

**E 88** Practice for Sampling Nonferrous Metals and Alloys in Cast Form for Determination of Chemical Composition

**E 527** Practice for Numbering Metals and Alloys (UNS)

**E 607** Test Method for Atomic Emission Spectrometric Analysis of Aluminum Alloys by the Point to Plane Technique Nitrogen Atmosphere

**E 716** Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis

**E 1251** Test Method for Analysis of Aluminum and Aluminum Alloys by Atomic Emission Spectrometry

2.2 *ANSI Standard:*

**H35.1/H35.1(M)** American National Standard Alloy and Temper Designation Systems for Aluminum<sup>3</sup>

2.3 *Aluminum Association's Standard:*

Designations and Chemical Composition Limits for Aluminum Alloys in the Form of Castings and Ingot (The Pink Sheets)<sup>3</sup>

## 3. Ordering Information

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

3.1.1 This specification designation (which includes the number, the year, and the revision letter, if applicable),

3.1.2 Alloy (Section 6, **Table 1**), and

3.1.3 The quantity in pieces or pounds.

<sup>3</sup> Available from Aluminum Association, Inc., 1525 Wilson Blvd., Suite 600, Arlington, VA 22209, <http://www.aluminum.org>.

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

**TABLE 1 Chemical Composition Limits of Aluminum Alloys in Ingot and Molten Forms for All Casting Processes<sup>1,2</sup>**

**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 E 29.

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

Designation		Registered Date	Products <sup>5</sup>	Composition, %											Others <sup>26</sup>		Aluminum Minimum
AA No.	Former			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Sn	Each	Total <sup>3</sup>		
100.1*	...	06/30/70	Ingot	0.15	0.6-0.8	0.10	... <sup>19</sup>	...	... <sup>19</sup>	...	0.05	... <sup>19</sup>	...	0.03 <sup>19</sup>	0.10	99.00 <sup>4</sup>	
130.1*	...	06/30/70	Ingot	... <sup>18</sup>	... <sup>18</sup>	0.10	... <sup>19</sup>	...	... <sup>19</sup>	...	0.05	... <sup>19</sup>	...	0.03 <sup>19</sup>	0.10	99.30 <sup>4</sup>	
150.1*	...	06/30/70	Ingot	... <sup>20</sup>	... <sup>20</sup>	0.05	... <sup>19</sup>	...	... <sup>19</sup>	...	0.05	... <sup>19</sup>	...	0.03 <sup>19</sup>	0.10	99.50 <sup>4</sup>	
160.1	...	01/28/76	Ingot	0.10 <sup>20</sup>	0.25 <sup>20</sup>	...	... <sup>19</sup>	...	... <sup>19</sup>	...	0.05	... <sup>19</sup>	...	0.03 <sup>19</sup>	0.10	99.60 <sup>4</sup>	
170.1*	...	06/30/70	Ingot	... <sup>21</sup>	... <sup>21</sup>	...	... <sup>19</sup>	...	... <sup>19</sup>	...	0.05	... <sup>19</sup>	...	0.03 <sup>19</sup>	0.10	99.70 <sup>4</sup>	
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 <sup>7</sup>	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 <sup>7</sup>	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 <sup>22</sup>	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 <sup>28</sup>	...	08/02/94	Ingot <sup>27</sup>	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	
302.1 <sup>28</sup>	...	08/02/94	Ingot <sup>27</sup>	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 <sup>28</sup>	...	08/02/94	Ingot <sup>27</sup>	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 <sup>28</sup>	A108	...	Ingot	5.0-6.0	0.8	4.0-5.0	0.50	0.10	...	...	1.0	0.25	...	...	0.50	Remainder	

TABLE 1 Continued

Designation		Registered Date	Products <sup>5</sup>	Composition, %												Aluminum Minimum
AA No.	Former			Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Sn	Others <sup>26</sup>		
														Each	Total <sup>3</sup>	
308.2 <sup>28</sup>	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 <sup>28</sup>	...	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	...	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 <sup>28</sup>	...	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 <sup>28</sup>	...	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
328.1 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	...	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	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 <sup>28</sup>	354	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 <sup>28</sup>	355	...	Ingot	4.5-5.5	0.50 <sup>10</sup>	1.0-1.5	0.50 <sup>10</sup>	0.45-0.6	0.25	...	0.35	0.25	...	0.05	0.15	Remainder
355.2 <sup>28</sup>	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 <sup>28</sup>	...	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 <sup>28</sup>	...	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 <sup>28</sup>	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 <sup>28</sup>	356	...	Ingot	6.5-7.5	0.50 <sup>10</sup>	0.25	0.35 <sup>10</sup>	0.25-0.45	...	...	0.35	0.25	...	0.05	0.15	Remainder
356.2 <sup>28</sup>	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 <sup>28</sup>	...	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 <sup>28</sup>	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
B356.2 <sup>28</sup>	...	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 <sup>28</sup>	...	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 <sup>28</sup>	...	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 <sup>28</sup>	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

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