Designation: B 361 – 95

Standard Specification for Factory-Made Wrought Aluminum and Aluminum-Alloy Welding Fittings[1]

This standard is issued under the fixed designation B 361; 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 only factory-made wrought aluminum and aluminum-alloy welding fittings in contrast to field-made fittings. The term "welding fittings" applies to butt-welding or socket-end parts, such as 45° elbows, 180° return bends, 90° short radius elbows, and other types made to the dimensional standards specified by ANSI B16.9, B16.11, and B16.28.

NOTE 1—Throughout this specification use of the term *alloy* in the general sense includes aluminum as well as aluminum-alloy.

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

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate[2]

B 210 Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes[2]

B 211 Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire[2]

B 221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes[2]

B 234 Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes for Condensers and Heat Exchangers[2]

B 241/B 241M Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube[2]

B 247 Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and Rolled Ring Forgings[2]

B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products[2]

2.3 *ANSI Standards:*

B16.9 Factory-Made Wrought Steel Butt-Welding Fittings[3]

B16.11 Forged Steel Fittings, Socket-Welding and Threaded[3]

B16.28 Wrought Steel Butt-Welding Short Radius Elbows and Returns[3]

H35.1 Alloy and Temper Designation Systems for Aluminum[2]

2.4 *AWS Standards:*

D10.7-60 Recommended Practices for Gas Shielded-Arc Welding of Aluminum and Aluminum-Alloy Pipe[4]

2.5 *Manufacturers' Standardization Society of the Valve and Fittings Industry:*

SP25 Standard Marking System for Valves, Fittings, Flanges and Unions[5]

2.6 *ASME Code:*

Section IX Boiler and Pressure Vessel Code[6]

2.7 *Military Standards:*

MIL-STD-129 Marking for Shipment and Storage[7]

2.8 *Federal Standards:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[7]

3. Terminology

3.1 *Definitions:*

3.1.1 *producer*—the primary manufacturer of the fittings.

3.1.2 *supplier*—includes only the category of jobbers and distributors as distinct from producers.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *capable of*—The term *capable of* as used in this specification means that the test need not be performed by the producer of the material. However, should testing by the purchaser establish that the material does not meet these

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[2] *Annual Book of ASTM Standards*, Vol 02.02.

[3] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

[4] Available from American Welding Society, 2501 N. W. 7th Street, Miami, FL 33125.

[5] Available from Manufacturers Standardization Society of the Valve and Fittings Industry, 5203 Leesburg Pike, Suite 502, Falls Church, VA 22041.

[6] Available from American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

[7] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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

requirements, the material shall be subject to rejection.

4. Ordering Information

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

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

4.1.2 Size, shape, and dimensions (8.1),

4.1.3 Quantity in number of pieces,

4.1.4 Alloy (Section 5),

4.1.5 Temper (Section 5),

4.2 Additionally, orders for material to this specification shall include the following information when required by the purchaser:

4.2.1 Whether tension tests of finished fittings are required (9.1),

4.2.2 Whether hydrostatic tests are required (10.2),

4.2.3 Whether inspection or witness of inspection and tests by the purchaser's representative is required prior to material shipment (Section 11),

4.2.4 Whether Practices B 660 applies and, if so, the levels of preservation, packaging, and packing required (14.3), and

4.2.5 Whether certification is required (Section 15).

5. Material

5.1 The aluminum or aluminum-alloy material used in the manufacture of the fittings shall be in accordance with the alloy and temper specified in the order. The material shall be in the form of rod, bar, forgings, sheet, plate, seamless pipe or seamless tube, each of which conforms to all requirements of the applicable ASTM specifications for the particular form and alloy involved. The applicable ASTM specifications and alloy designations are listed in Table 1.

6. Manufacture

6.1 Forging or shaping operations may be performed by hammering, pressing, piercing, rolling, extruding, upsetting, bending, or fusion welding, or by a combination of two or more of these operations. The forming procedure shall be so applied that it will not produce injurious defects in the fittings.

6.2 Manufacturing operations necessitating welded seams or other joining by fusion welding shall have full penetration welds, excepting the lightweight fittings (Note 2), and shall be made in accordance with procedures by welders or welding

TABLE 1 Requirements for Aluminum and Aluminum-Alloy Materials Used in the Manufacture of Fittings

Alloy Designation[A,B]	Type of Material	Applicable ASTM Specifications			
		Pipe or Tube	Plate	Bar	Forging
WP1060[C]	99.6 % pure aluminum	B 210 B 221 B 234 B 241/B 241M	 B 209	 B 211 B 221	 ...
WP1100[C]	commercially pure low-strength aluminum	B 210 B 221 B 241/B 241M	 B 209	 B 211 B221	 B 247
WP3003[C]	aluminum-base manganese alloy	B 210 B 221 B 234 B 241/B 241M	 B 209	 B 211 B 221	 B 247
WP Alclad[C] 3003	aluminum-base manganese alloy core, clad on one side (inside only) in case of pipe	B 210 B 221 B 234 B 241/B 241M	 B 209		
WP5083[D]	aluminum-base magnesium-manganese alloy	B 210 B 221 B 241/B 241M	 B 209	 B 221	 B 247
WP5086[D]	aluminum-base magnesium-manganese alloy	B 210 B 221 B 241/B 241M	 B 209	 B 221	
WP5154[C]	aluminum-base magnesium alloy	B 210 B 221	 B 209	B 211 B 221	
WP6061	aluminum-base magnesium-silicon heat-treatable alloy	B 210 B 221 B 234 B 241/B 241M	 B 209	 B 211 B 221	 B 247
WP6063	aluminum-base magnesium-silicon heat-treatable alloy	B 210 B 221 B 241/B 241M	 ...	 B 221	 ...

[A] When fittings are of welded construction, designation shall be supplemented by the suffix "W."

[B] These alloy designations were established in accordance with ANS1 H35.1, except for the letter symbols "WP," which denote wrought product.

[C] Fittings in nonheat-treatable alloys 1060, 1100, 3003, Alclad 3003, and 5154 are available only in the F or H112 tempers as covered by the applicable raw material specification.

[D] Fittings in nonheat-treatable alloys 5083 and 5086 are available in the O, F, or H112 tempers as covered by the applicable raw material specification.