



## Standard Specification for Steel Rivets and Bars for Rivets, Pressure Vessels<sup>1</sup>

This standard is issued under the fixed designation A31; 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 superscripted epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope\*

1.1 This specification<sup>2</sup> covers steel rivets for use in boilers and pressure vessels and steel bars for use in the manufacture of rivets.

1.2 Two grades are covered:

1.2.1 *Grade A*—Bars having a yield point of 23 000 psi (160 MPa) minimum with carbon 0.18% maximum.

1.2.2 *Grade B*—Bars having a yield point of 29 000 psi (200 MPa) minimum with carbon 0.28 % maximum.

1.2.3 Rivets are manufactured from the applicable bar grade.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

### 2. Referenced Documents

2.1 *ASTM Standards*:<sup>3</sup>

A29/A29M Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

F1470 Practice for Fastener Sampling for Specified Mechanical Properties and Performance Inspection

2.2 *ASME Standards*:<sup>4</sup>

B18.1.1 Small Solid Rivets 3/16 Inch Nominal Diameter and Smaller

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.02 on Steel Bolts, Nuts, Rivets and Washers.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Specification SA-31 in Section II of that Code.

<sup>3</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.

<sup>4</sup> Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

B18.1.2 Large Rivets 1/2 Inch Nominal Diameter and Larger  
B18.24 Part Identifying Number (PIN) Code System Standard for B18 Fastener Products

### 3. Ordering Information

3.1 Orders for rivets and bars under this specification shall include:

3.1.1 Specification designation and date of issue,

3.1.2 *Quantity*—Number of pieces for rivets and weight for bars,

3.1.3 Name of product and grade (A or B),

3.1.4 Size (diameter and length),

3.1.5 Rivet head type,

3.1.6 If inspection at point of manufacture is required,

3.1.7 Certification, if required (Section 14), and

3.1.8 Additional testing or special requirements, if required.

3.1.9 For establishment of a part identifying system, see ASME B18.24.

NOTE 1—A typical ordering description is: ASTM A31 – 82, 10 000 pieces, steel rivets Grade A, 1/2 by 2 in., button head, test reports required.

### 4. Materials and Manufacture

4.1 The steel shall be made by any of the following processes: open-hearth, electric-furnace, or basic-oxygen.

4.2 Rivets shall be manufactured from rivet bars conforming to the applicable grade ordered.

4.3 Rivets shall be manufactured by hot- or cold-heading.

4.4 Bars shall be furnished as rolled and not pickled, blast cleaned, or oiled. At producer's option, bars may be cleaned for inspection or cold drawn.

### 5. Chemical Composition

5.1 The steel shall conform to chemical composition prescribed in Table 1.

5.2 *Heat Analysis*—An analysis of each heat of steel shall be made by the bar manufacturer to determine for Grades A and B the percentages of carbon, manganese, phosphorus, and sulfur. This analysis shall be made from a test ingot taken during the pouring of the heat. The chemical composition thus determined shall be reported to the purchaser or his representative and shall conform to the requirements for heat analysis in accordance with Table 1.