



Designation: A 437/A 437M – 01a

## Standard Specification for Alloy-Steel Turbine-Type Bolting Material Specially Heat Treated for High-Temperature Service<sup>1</sup>

This standard is issued under the fixed designation A 437/A 437M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This specification<sup>2</sup> covers alloy-steel bolting material specially heat treated for high-temperature service, such as steam turbine, gas turbine, and similar uses. This material requires special processing and should not be used in general-purpose applications. The term “bolting material,” as used in this specification, covers rolled or forged bars, bolts, nuts, screws, washers, studs, and stud bolts. The bars shall be hot wrought. The material may be further processed by centerless grinding or by cold drawing.

1.2 The high-temperature properties of the material covered by this specification are dependent upon special heat treatment, which is required. Although the high-temperature properties are not specified, they are implied by control of the chemistry, heat treatment, and room-temperature properties of the material.

NOTE 1—High-temperature tests shall not be required, unless made a matter of agreement between the manufacturer and the purchaser.

1.3 Three levels of bolting strength are covered, designated Grades B4B, B4C, and B4D. Selection will depend on the design and the stresses and service for which the product is to be used.

NOTE 2—When ordering material under this specification, or when incorporating this specification as a reference in any individual specification, the purchaser must designate the steel by identification symbol or analysis, or both, and definitely specify the minimum mechanical properties required as selected from Table 1.

1.4 This specification is expressed in both inch-pound units and in SI units. However, unless the order specifies the applicable “M” specification designation (SI units), the material shall be furnished to inch-pound units.

1.5 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each

system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 962/A 962M Specification for Common Requirements for Steel Fasteners or Fastener Materials, or Both, Intended for Use at Any Temperature from Cryogenic to the Creep Range<sup>3</sup>

E 381 Method of Macroetch Testing Steel Bars, Billets, Blooms, and Forgings<sup>4</sup>

### 3. Common Requirements

3.1 Material and Fasteners supplied to this specification shall conform to Specification A 962/A 962M. These requirements include test methods, finish, thread dimensions, marking certification, optional supplementary requirements, and others. If the requirements of this specification are in conflict with those of A 962/A 962M, then the requirements of this specification shall prevail.

### 4. Ordering Information

4.1 The inquiry and order should indicate the following:

4.1.1 Specification designation, grade and class, issue date and revision letter,

4.1.2 Quantity (weight or number of pieces),

4.1.3 Description (bars, bolts, nuts, etc.),

4.1.4 Dimensions,

4.1.5 Finish, and

4.1.6 Impact testing of nuts, if required (see Section 9).

### 5. Discard

5.1 A sufficient discard shall be made from each ingot to ensure freedom from injurious piping and undue segregation.

5.2 *Quality*—To ensure soundness, bars and wire shall be tested in accordance with Method E 381 or other suitable method as agreed upon between the purchaser and the producer. When bar or wire is supplied, the bar or wire producer

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.22 on Steel Forgings and Wrought Fittings for Piping Applications and Bolting Materials for Piping and Special Purpose Applications.

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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications see related Specification SA-437 in Section II of that code.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.01.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 03.01.