



## Standard Specification for Roof and Rock Bolts and Accessories<sup>1</sup>

This standard is issued under the fixed designation F 432; 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.

### 1. Scope

1.1 This specification covers the chemical, mechanical, and dimensional requirements for roof and rock bolts and accessories. Addressed in this specification are double-end threaded and slotted steel bars; fully grouted bolts and threaded bars; mechanical anchorage devices used for point anchorage applications; roof truss systems; partially grouted deformed bolts; formable anchorage devices; and other frictional anchorage devices. All of these products represent various designs used for ground support systems. This specification can be revised to address new technologies.

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

1.3 This hazard statement applies only to Section 10, Test Methods of this specification. *This standard does not purport to address 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:

- A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for<sup>2</sup>
- A 47 Specification for Ferritic Malleable Iron Castings<sup>3</sup>
- A 194/A 194M Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service<sup>4</sup>
- A 220 Specification for Pearlitic Malleable Iron<sup>3</sup>
- A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>5</sup>
- A 536 Specification for Ductile Iron Castings<sup>3</sup>

A 563 Specification for Carbon and Alloy Steel Nuts<sup>6</sup>

A 568/A 568M Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for<sup>5</sup>

A 615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement<sup>7</sup>

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products<sup>5</sup>

D 1248 Specification for Polyethylene Plastics Molding and Extrusion Material<sup>8</sup>

F 436 Specification for Hardened Steel Washers<sup>6</sup>

F 606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets<sup>6</sup>

#### 2.2 ASME Standards:

B 1.1 Unified Screw Threads<sup>9</sup>

B 1.3M Screw Thread Gaging Systems for Dimensional Acceptability—Inch and Metric Screw Threads<sup>9</sup>

B 18.2.2 Square and Hex Nuts<sup>9</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *bearing plates, plate washers, mine roof plates*—plates that serve to distribute the load from the exposed end of the bolt or threaded bar to the rock face or intermediate member.

3.1.1.1 *header plates*—large rectangular bearing plates, usually 6 in. (152 mm) wide by 16 to 18 in. (406.4 to 457.2 mm) long, or any other shape with an equivalent area, used in substitution for wooden header blocks for wider distribution of the bolt load than is possible with standard bearing plates.

3.1.2 *bendable bolts*—bolts furnished with an altered section at some location, to be specified by the customer, at which the bar will bend.

3.1.2.1 *Discussion*—Bending is necessary to permit installation of bars longer than the mine opening height. This altered section may be produced by hot or cold forging, or by shearing, sawing, trimming, machining, grinding, or a combination of these processes.

<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> *Annual Book of ASTM Standards*, Vol 01.05.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.02.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 01.01.

<sup>5</sup> *Annual Book of ASTM Standards*, Vol 01.03.

<sup>6</sup> *Annual Book of ASTM Standards*, Vol 01.08.

<sup>7</sup> *Annual Book of ASTM Standards*, Vol 01.04.

<sup>8</sup> *Annual Book of ASTM Standards*, Vol 08.01.

<sup>9</sup> Available from ASME International, Information Central, 22 Law Dr., PO Box 2300, Fairfield, NJ 07007-2300.