



Designation: F 467 – 03

## Standard Specification for Nonferrous Nuts for General Use<sup>1</sup>

This standard is issued under the fixed designation F 467; 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 the requirements for commercial wrought nonferrous nuts 0.250 to 1.500 in. inclusive in diameter in a number of alloys in common use and intended for general service applications.

1.2 Applicable bolts, cap screws, and studs for use with nuts covered by this specification are covered by Specification F 468.

NOTE 1—A complete metric companion to Specification F 467 has been developed—F 467M; therefore no metric equivalents are presented in this specification.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- B 154 Test Method for Mercurous Nitrate Test for Copper and Copper Alloys<sup>2</sup>
- B 446 Specification for Nickel-Chromium-Molybdenum-Columbium-Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar<sup>3</sup>
- D 3951 Practice for Commercial Packaging<sup>4</sup>
- E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials<sup>5</sup>
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications<sup>6</sup>
- E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum Base Alloys<sup>7</sup>
- E 38 Methods for Chemical Analysis of Nickel-Chromium and Nickel-Chromium-Iron Alloys<sup>8</sup>
- E 53 Test Methods for Determination of Copper in Unal-

loyed Copper by Gravimetry<sup>7</sup>

- E 54 Test Methods for Chemical Analysis of Special Brasses and Bronzes<sup>9</sup>
  - E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition<sup>7</sup>
  - E 62 Test Methods for Chemical Analysis of Copper and Copper Alloys (Photometric Methods)<sup>7</sup>
  - E 75 Test Methods for Chemical Analysis of Copper-Nickel and Copper-Nickel-Zinc Alloys<sup>7</sup>
  - E 76 Test Methods for Chemical Analysis of Nickel-Copper Alloys<sup>7</sup>
  - E 92 Test Method for Vickers Hardness of Metallic Materials<sup>5</sup>
  - E 101 Test Method for Spectrographic Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique<sup>10</sup>
  - E 120 Test Methods for Chemical Analysis of Titanium and Titanium Alloys<sup>7</sup>
  - E 165 Practice for Liquid Penetrant Examination<sup>11</sup>
  - E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique<sup>9</sup>
  - E 354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys<sup>7</sup>
  - E 478 Test Methods for Chemical Analysis of Copper Alloys<sup>7</sup>
  - E 1409 Test Method for Determination of Oxygen in Titanium and Titanium Alloys by the Inert Gas Fusion Technique<sup>7</sup>
  - F 468 Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use<sup>12</sup>
  - F 606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets<sup>12</sup>
  - F 1470 Guide for Fastener Sampling for Specified Mechanical Properties and Performance Inspection<sup>12</sup>
- #### 2.2 ASME Standards:

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee F16 on Fasteners and is the direct responsibility of Subcommittee F16.04 on Nonferrous Fasteners.

Current edition approved May 10, 2003. Published June 2003. Originally approved in 1976. Last previous edition approved in 2001 as F 467 – 01a.

<sup>2</sup> Annual Book of ASTM Standards, Vol 02.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 02.04.

<sup>4</sup> Annual Book of ASTM Standards, Vol 15.09.

<sup>5</sup> Annual Book of ASTM Standards, Vol 03.01.

<sup>6</sup> Annual Book of ASTM Standards, Vol 14.02.

<sup>7</sup> Annual Book of ASTM Standards, Vol 03.05.

<sup>8</sup> Discontinued—see 1988 Annual Book of ASTM Standards, Vol 03.05. Replaced by E 350.

<sup>9</sup> Discontinued—see 2001 Annual Book of ASTM Standards, Vol 03.05.

<sup>10</sup> Discontinued—see 1995 Annual Book of ASTM Standards, Vol 03.05.

<sup>11</sup> Annual Book of ASTM Standards, Vol 03.03.

<sup>12</sup> Annual Book of ASTM Standards, Vol 01.08.



## F 467 – 03

B 1.1 Unified Inch Screw Threads (UN and UNR Thread Form)<sup>13</sup>

B 18.2.2 Square and Hex Nuts<sup>13</sup>

### 3. Ordering Information

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

3.1.1 Quantity (number of pieces of each item and size);

3.1.2 Name of item;

3.1.3 Size (diameter and threads per inch);

3.1.4 Alloy number (Table 1);

3.1.5 Stress relieving, if required (4.2.3);

3.1.6 “Shipment lot” testing, as required (Section 9);

3.1.7 Source inspection, if required (Section 14);

3.1.8 Certificate of compliance or test report, if required (Section 16);

3.1.9 Additional requirements, if any, to be specified on the purchase order (4.2.1, 7.2, 8.2, , 12.1, and 13.1),

3.1.10 Supplementary requirements, if any; and

3.1.11 ASTM designation (including year or published date).

<sup>13</sup> Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112.

NOTE 2—A typical ordering description is as follows: 10 000 pieces, Hex Nut, 0.250” -20, Alloy 270, Furnish Certificate of Compliance, Supplementary Requirement S 1, ASTM Specification F 467-XX



TABLE 1 Chemical Requirements

| UNS Designation Number | Composition, %                |                         |          |                      |           |                |                        |            |                      |                        |           |           |              |  |
|------------------------|-------------------------------|-------------------------|----------|----------------------|-----------|----------------|------------------------|------------|----------------------|------------------------|-----------|-----------|--------------|--|
|                        | Copper and Copper-Base Alloys |                         |          |                      |           |                |                        |            |                      |                        |           |           |              |  |
|                        | Alloy                         | General Name            | Aluminum | Copper, min          | Iron, max | Manganese, max | Nickel, max            | Phosphorus | Silicon              | Zinc, max <sup>A</sup> | Lead, max | Tin       | Arsenic, max |  |
| C11000                 | 110                           | ETP copper              |          | 99.9                 |           |                |                        |            |                      |                        |           |           |              |  |
| C27000                 | 270                           | brass                   |          | 63.0–68.5            | 0.07      |                |                        |            |                      | balance                | 0.10      |           |              |  |
| C46200                 | 462                           | naval brass             |          | 62.0–65.0            | 0.10      |                |                        |            |                      | balance                | 0.20      | 0.5–1.0   |              |  |
| C46400                 | 464                           | naval brass             |          | 59.0–62.0            | 0.10      |                |                        |            |                      | balance                | 0.20      | 0.5–1.0   |              |  |
| C51000                 | 510                           | phosphor bronze         |          | balance <sup>A</sup> | 0.10      |                |                        |            |                      | 0.30                   | 0.05      | 4.2–5.8   |              |  |
| C61300                 | 613                           | aluminum bronze         | 6.0–7.5  |                      | 2.0–3.0   | 0.10           | 0.15 <sup>C</sup>      | 0.03–0.35  | 0.10                 | 0.05                   | 0.01      | 0.20–0.50 |              |  |
| C61400                 | 614                           | aluminum bronze         | 6.0–8.0  |                      | 1.5–3.5   | 1.0            |                        |            |                      |                        |           |           |              |  |
| C63000                 | 630                           | aluminum bronze         | 9.0–11.0 |                      | 2.0–4.0   | 1.5            | 4.0–5.5                |            |                      |                        |           |           |              |  |
| C64200                 | 642                           | aluminum silicon bronze | 6.3–7.6  |                      | 0.30      | 0.10           | 0.25                   |            | 0.25 max             | 0.50                   | 0.05      | 0.20 max  | 0.15         |  |
| C65100                 | 651                           | silicon bronze          |          | 88.65 <sup>D</sup>   | 0.8       | 0.7            |                        |            | 1.5–2.2 <sup>E</sup> | 1.5                    | 0.05      | 0.20 max  |              |  |
| C65500                 | 655                           | silicon bronze          |          | 96.0 <sup>D</sup>    | 0.8       | 1.5            | 0.6                    |            | 0.8–2.0              | 1.5                    | 0.05      |           |              |  |
| C66100                 | 661                           | silicon bronze          |          | 94.0 <sup>D</sup>    | 0.8       | 1.5            |                        |            | 2.8–3.8              | 1.5                    | 0.05      |           |              |  |
| C67500                 | 675                           | manganese bronze        | 0.25 max | 57.0–60.0            | 0.25      | 0.05–0.5       |                        |            | 2.8–3.5              | 1.5                    | 0.20–0.8  |           |              |  |
| C71000                 | 710                           | cupro-nickel            |          | 74.0 <sup>D</sup>    | 0.60      | 1.00           | 19.0–23.0 <sup>C</sup> |            |                      | balance                | 0.20      | 0.5–1.5   |              |  |
| C71500                 | 715                           | cupro-nickel            |          | 65.0 <sup>D</sup>    | 0.40–0.7  | 1.00           | 29.0–33.0 <sup>C</sup> |            |                      | 1.00                   | 0.05      |           |              |  |

<sup>A</sup> Elements shown as balance shall be arithmetically computed by deducting the sum of the other named elements from 100.

<sup>B</sup> Copper plus specified elements = 99.8 min; copper plus silver = 88.5–91.5.

<sup>C</sup> Cobalt is to be counted as nickel.

<sup>D</sup> Minimum content of copper plus all other elements with specified limits shall be 99.5 %.

<sup>E</sup> An alloy containing as high as 2.6 % silicon is acceptable provided the sum of all the elements other than copper, silicon, and iron does not exceed 0.30 %.