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| **ASTM Spec Number** | **Specification Title** | **Applicable Materials**  **(See Note 1)** | **Additional Requirements Mechanical Testing**  **(See Notes 2 and 4)** |
| A193 | Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service | 1. Chrome Moly-Carbon Steel, Grade B16 | Decarburization testing shall be performed on one sample per lot IAW SAE J121, Class B. Lot defined as a heat treatment furnace load. |
| A194 | Carbon and Alloy Steele Nuts for High Pressure and High Temperature Service | 1. Carbon Steel, Grade 4  2. Carbon Steel, Grade 7 | 1. Decarburization testing shall be performed on one sample per lot IAW SAE J121, Class B. Lot defined as a heat treatment furnace load.  2. Nuts greater than 120 ksi require supplement S5-Proof Loading.  3. Lot and sample size shall be as required by Note 3. |
| A354 | Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners | 1. Carbon Steel, Grade 8 | Decarburization testing shall be performed on one sample per lot IAW SAE J121, Class B. Lot defined as a heat treatment furnace load. |
| A453/A453M | Standard Specification for High-Temperature Bolting, With Expansion Coefficients Comparable to Austenitic Stainless Steel | 1. Stainless Steel, Grade 660 A, B & C 2. Stainless Steel, Grade 651 A & B 3. Stainless Steel, Grade 662 A & B 4. Stainless Steel, Grade 665 A & B 5. Stainless Steel, Grade 668 A & B | In addition to chemical and physical certifications, stress rupture test certification is required in accordance with Table 6 of ASTM A453/A453M |
| A563 | Carbon and Alloy Steel Nuts | 1. Carbon Steel, Grade 5  2. Carbon Steel, Grade 8 | 1. Decarburization testing shall be performed on one sample per lot IAW SAE J121, Class B. Lot defined as a heat treatment furnace load.  2. Lot and sample size shall be as required by Note 3. |
| A467 | Nonferrous Nuts for General Use | 1. Nickel-Copper (400) | No additional testing required. |
| A468 | Nonferrous Bolts, Hex Cap Screws, and Studs for General Use | 1. Nickel-Copper (400)  2. Nickel-Copper-Alum (500) | Ni-Cu-Al alloy materials shall specifically be IAW QQ-N-00286F (SH). |
| F593 | Stainless Steel Bolts, Hex Cap Screws, and Studs | 1. CRES 316 strain hardened  2. CRES 316 cold worked | CRES shall be passivated in accordance with ASTM A 380 (i.e., chemical cleaning in accordance with ASTM A 380 per par. 6.4, including Note 3). |
| F594 | Stainless Steel Nuts | 1. CRES 316 strain hardened  2. CRES 316 cold worked | CRES shall be passivated in accordance with ASTM A 380 (i.e., chemical cleaning in accordance with ASTM A 380 per par. 6.4, including Note 3). |

**TABLE 1. ADDITIONAL MECHANICAL TESTING REQUIREMENTS FOR ASTM FASTENERS**

**NOTES:**

1. ASTM substitutions other than those materials specifically identified in this Table shall be separately approved by the Navy.
2. Reduced inspection is not allowed for mechanical tests.
3. For production lot sizes of 8,000 or less pieces, ASTM inspection lot sizes and sampling shall be modified to meet the following.

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| **Lot Size**  **(# of pieces in lot)** | **Sample**  **Size** | **Acceptance**  **Number** | **Rejection**  **Number** |
| 50 and less  51 to 8,000 | 2  3 | 0  0 | 1  1 |

1. Fasteners and nuts must have certificates of compliance that mechanical tests, chemical analysis, and visual and dimensional inspections have been performed and passed.

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| SPECIFIC INSPECTION | **AQL REQUIREMENTS** |
| The following inspection shall be specifically accomplished for fasteners (studs, bolts, hexagonal bolts, socket head cap screws, and nuts) in accordance with ANSI standards as referenced in the applicable ASTM fastener specification:   * Identification Symbols (all fasteners) * Thickness (nuts) * Head Height (all except nuts) * Head Diameter (socket head cap screws) * Hex Socket Size (socket head cap screws) * Key Engagement (socket head cap screws) * Distance across Flats (bolts, hex cap screws, nuts) * Width across Corners (bolts, hex cap screws, nuts) * Total runout bolts, hex cap screws, nuts) * Body Diameter (all except nuts) * Overall length (all except nuts) * Thread Length (all except nuts * Fillet Radius (all except studs and nuts) * Diameter of Washer Face (all except studs and nuts) * Straightness (all except nuts) * Quality – workmanship (all) | Sampling for inspection shall be in accordance with MIL-STD-105, General Inspection, Level I, with an AQL of 2.5%. The initial inspection procedure shall be normal. When normal inspection is in effect, reduced inspection may be instituted if there have been no rejected lots on initial inspection in the preceding ten lots, and the total number of defectives in the samples from the preceding ten lots is equal to or less than the applicable number given in Table VIII of MIL-STD-105. When reduced inspection is in effect, normal inspection shall be instituted if any lot is rejected. |

# TABLE 2. ADDITIONAL VISUAL AND DIMENSIONAL REQUIREMENTS FOR ASTM FASTENERS