# A194 a194m standard specification for carbon and alloy

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ASTM A194 Specifications\*\*

ASTM A194 is an American Society for Testing and Materials (ASTM) specification for carbon and alloy steel nuts for bolts for high-pressure and high-temperature service. It defines the requirements for nut dimensions, material properties, markings, and testing.

#### **ASTM A194 GR 4 Material**

ASTM A194 GR 4 material is a high-strength alloy steel with a minimum tensile strength of 120 ksi (827 MPa) and a minimum hardness of 32 HRC. It is suitable for applications involving high stresses and temperatures up to 1000°F (538°C).

## **ASTM A194 Marking**

Nuts manufactured to ASTM A194 specifications are marked with the following information:

- Manufacturer's name or trademark
- Grade designation (e.g., GR 4)
- Size
- Lot number

Difference between ASTM A194 and ASME SA194

ASTM A194 and ASME SA194 are two similar specifications, but they have some

key differences. ASTM A194 is a more general specification that covers a wider

range of nut types and sizes, while ASME SA194 is specific to heavy hex nuts.

Difference between ASTM A194 Grade 2H and 2HM

ASTM A194 Grade 2H is a hardened and tempered nut with a minimum hardness of

32 HRC. ASTM A194 Grade 2HM is a hot-forged nut with a minimum hardness of 28

HRC.

Difference between A193 and A194

ASTM A193 is a specification for alloy steel bolting materials for high-temperature

service. It covers the requirements for bolts, studs, and seamless threaded studs.

ASTM A194 is a specification for carbon and alloy steel nuts for use with bolts.

Hardness of ASTM A194 Grade 7

The hardness of ASTM A194 Grade 7 nuts ranges from 32 to 38 HRC.

Difference between A194 Grade 8 and 8M

ASTM A194 Grade 8 is a hardened and tempered nut with a minimum hardness of

36 HRC. ASTM A194 Grade 8M is a martensitic stainless steel nut with a minimum

hardness of 40 HRC.

Composition of A194 GR 6

• Carbon: 0.35% max

Manganese: 0.60% - 1.65%

• Phosphorus: 0.040% max

• Sulfur: 0.050% max

• Silicon: 0.15% - 0.50%

• Nickel: 0.40% - 0.70%

• Chromium: 0.80% - 1.20%

• Molybdenum: 0.15% - 0.25%

#### Difference between ASTM F594 and A194

ASTM F594 is a specification for stainless steel nuts, while ASTM A194 is a specification for carbon and alloy steel nuts.

#### **ASTM A194 Grade 8M Material**

ASTM A194 Grade 8M material is a martensitic stainless steel with a minimum tensile strength of 150 ksi (1034 MPa) and a minimum hardness of 40 HRC. It is highly resistant to corrosion and suitable for applications involving high stresses and temperatures up to 1000°F (538°C).

#### **ASTM A194 GR 7 Material**

ASTM A194 GR 7 material is a heat-treated alloy steel with a minimum tensile strength of 130 ksi (896 MPa) and a minimum hardness of 32 HRC. It is suitable for applications involving high stresses and temperatures up to 1000°F (538°C).

### **ASTM Grade Specification**

An ASTM grade specification defines the requirements for the chemical composition, mechanical properties, and other characteristics of a particular type of material. It is used to ensure that materials meet the specific needs of an application.

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