

# Corrosion Resistant Bolting for Use in the Petroleum and Natural Gas Industries

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# Corrosion Resistant Bolting for Use in the Petroleum and Natural Gas Industries

## 1 Scope

### 1.1 Purpose

This specification specifies requirements for the qualification, production and documentation of corrosion resistant bolting used in the petroleum and natural gas industries.

### 1.2 Applicability

This standard applies when referenced by an applicable API equipment standard or otherwise specified as a requirement for compliance.

### 1.3 Bolting Specification Levels (BSL)

This specification establishes requirements for two bolting specification levels (BSL). These two BSL designations define different levels of technical, quality and qualification requirements. The levels are designated as BSL-2 and BSL-3. BSL-2 includes requirements in addition to those stated in the ASTM A453 and API 6A718. BSL-3 adds technical, quality and qualification criteria to BSL-2. BSL-2 and BSL-3 are intended to be comparable to BSL-2 and BSL-3 as found in API 20E. BSL-1 is omitted from this standard.

### 1.4 Bolting Types

This specification covers the following product forms, processes, and sizes:

- a) machined studs;
- b) machined bolts, screws and nuts;
- c) cold headed bolts, screws and nuts;
- d) hot formed bolts and screws <1.5 in. (38.1 mm) nominal diameter;
- e) hot formed bolts and screws ≥1.5 in. (38.1 mm) nominal diameter;
- f) roll threaded studs, bolts, and screws <1.5 in. (38.1 mm) diameter;
- g) roll threaded studs, bolts, and screws ≥1.5 in. (38.1 mm) diameter;
- h) hot formed nuts <1.5 in. (38.1 mm) nominal diameter;
- i) hot formed nuts ≥1.5 in. (38.1 mm) nominal diameter.

### 1.5 Application of the API Monogram

If product is manufactured at a facility licensed by API and it is intended to be supplied bearing the API Monogram, the requirements of Annex A apply.

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies, except that new editions may be used on issue and become mandatory 6 months from the date of publication.

API Specification 6A, *Specification for Wellhead and Christmas Tree Equipment*

API Standard 6A718, *Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment*

ANSI/NCSL Z540.3 <sup>1</sup>, *Requirements for the Calibration of Measuring and Test Equipment*

ASTM A370-14 <sup>2</sup>, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*

ASTM A453, *Standard Specification for High-Temperature Bolting, with Expansion Coefficients Comparable to Austenitic Stainless Steels*

ASTM A751, *Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products*

ASTM A962-14a, *Standard Specification for Common Requirements for Bolting Intended for Use at Any Temperature from Cryogenic to the Creep Range*

ASTM E10, *Standard Test Method for Brinell Hardness of Metallic Materials*

ASTM E18, *Standard Test Methods for Rockwell Hardness of Metallic Materials*

ASTM E1476, *Standard Guide for Metals Identification, Grade Verification, and Sorting*

ASTM F788, *Standard Specification for Surface Discontinuities of Bolts, Screws, and Studs, Inch and Metric Series*

ASTM F812, *Standard Specification for Surface Discontinuities of Nuts, Inch and Metric Series*

SAE AMS 2750, *Pyrometry*

SAE AMS H-6875, *Heat Treatment of Steel Raw Materials*

## 3 Terms, Definitions, Acronyms, and Abbreviations

### 3.1 Terms and Definitions

For the purposes of this document, the following definitions apply.

#### 3.1.1

##### **bolting**

All-thread studs, tap-end studs, double-ended studs, headed bolts, cap screws, screws, and nuts.

#### 3.1.2

##### **cold formed bolts, screws, and nuts**

Parts formed through the mechanical cold upsetting of wire, rod or bar in order to generate the bolt or screw head (cold heading) or the configuration of the nut.

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<sup>1</sup> NCSL International, 2995 Wilderness Place, Suite 107, Boulder, Colorado 80301-5404, [www.ncsli.org](http://www.ncsli.org).

<sup>2</sup> ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, [www.astm.org](http://www.astm.org).