

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

API SPECIFICATION 20F
FIRST EDITION, JUNE 2015



AMERICAN PETROLEUM INSTITUTE

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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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 ¹, *Requirements for the Calibration of Measuring and Test Equipment*

ASTM A370-14 ², *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.

¹ NCSL International, 2995 Wilderness Place, Suite 107, Boulder, Colorado 80301-5404, www.ncsli.org.

² ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.

3.1.3**corrosion resistant bolting**

Bolting manufactured from metal that achieves improved resistance to corrosion through the addition of alloying elements.

3.1.4**heat**

Material originating from a final melt, or for remelted alloys, the raw material originating from a single remelted ingot.

3.1.5**heat lot**

- a) Batch furnace: bolting or raw material of a single heat and diameter, heat treated together as a single solution annealing, quenching and precipitation hardening charge.
- b) Continuous furnace (applies to Grade 660D only): bolting or raw material of a single heat and diameter heat treated without interruption in a continuous charge with testing as defined for bolts in ASTM A193-15, Section 12.1.

3.1.6**hot formed bolts, screws, and nuts**

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

3.1.7**machined bolts, screws, and nuts**

Parts manufactured by machining from raw material to generate the bolt, screw head, or the configuration of the nut.

3.1.8**manufacturing process specification****MPS**

A written document describing the complete production sequence and method.

NOTE MPS are usually proprietary by manufacturer and not for general publication but are available for review by customers or authorized third parties.

3.1.9**production lot**

Bolting of a single nominal diameter and grade made from the same heat number and heat treated in the same batch if batch-type heat treating equipment is used or heat treated in the same continuous run of not more than 8 hours under the same conditions if continuous-type heat treating equipment is used.

3.1.10**raw material**

Bar, coil, rod, or wire used to manufacture bolting.

3.1.11**raw material supplier**

The manufacturer of raw material used to produce qualified bolting defined as the mill or forging supplier.

NOTE A distributor is not considered a raw material supplier.

3.1.12**wrought structure**

Structure that contains no cast dendritic elements.

3.2 Acronyms and Abbreviations

BSL	bolting specification level
MPS	manufacturing process specification
NDE	nondestructive examination

4 Qualification Bolting

4.1 General

4.1.1 This standard states the requirements for two bolting specification levels (BSL) and nine bolting types. The manufacturer may qualify to one or more of the bolting types listed in 1.4 and to one or both BSLs. Each individual bolting type shall be qualified. Qualification to the higher BSL shall qualify to the lower BSL. The following paragraphs describe the conditions which, when met, allow the bolting to meet the appropriate bolting type and BSL classification level.

4.1.2 Qualification bolts and nuts shall be produced from raw material procured from an approved supplier as defined in 5.1 and manufactured in accordance with an applicable manufacturing process specification (MPS) from a bolting grade listed in 4.6.

4.2 Qualification Testing

4.2.1 Qualification bolting shall be tested and evaluated by the bolting manufacturer in order to establish qualification to the bolting types listed in 1.4. Qualification bolting shall meet all of the requirements indicated in Table 1 for the applicable paragraphs of this specification.

4.2.2 All required tests, including those certified by the raw material supplier, shall be performed by a laboratory qualified in accordance with an internationally recognized international standard for the qualification of test laboratories, such as ISO 17025.

4.2.3 Qualification may be performed on parts specifically manufactured for qualification or random parts selected from a production lot. A sufficient number of parts shall be used to provide adequate material for all required tests.

4.2.4 The manufacturer shall retain and have available a MPS (see 5.3) and qualification records (see 4.7) for each product qualified. The qualification records shall show all of the products, processes and sizes qualified and all of the Table 1 requirements for each qualification including the results of tests and inspections. The following manufacturing process steps shall be documented as a part of the qualification:

- forming,
- heat treatment,
- machining,
- roll threading,
- testing,
- inspection.

Table 1—Bolting Test Requirements

BSL	Material	Heat Treatment	Chemistry	Mechanical	Metallurgical	Hardness	NDE Surface	NDE Volumetric
BSL-2	5.5.1	5.4.1	5.6	5.7.1	5.8.	5.9.1	5.10.1	—
BSL-3	5.5.2	5.4.2	5.6	5.7.2	5.8.	5.9.1	5.10.2.1	5.10.2.2

4.3 Materials and Dimensions

4.3.1 The following bolting material categories are covered by this specification:

- precipitation hardened nickel based alloys in accordance with API 6A718,
- precipitation hardened austenitic iron based A453 Grade 660 Class D

4.3.2 All requirements of API 6A718 or ASTM A453 Grade 660 Class D shall be met except as modified by this specification. In the case of conflict between the requirements of referenced specifications and this specification, the requirements of this specification shall apply.

4.3.3 All dimensions shall meet the requirements of ASTM A962. Oversizing of nut threads or under sizing of bolt threads is not permissible.

4.4 Acceptance of Qualification Bolting

4.4.1 General

Results of the tests specified in Table 1 shall comply with the acceptance criteria specified in Section 5 and the bolting manufacturer's written specification. Results shall be documented.

4.4.2 Qualification Samples

4.4.2.1 Samples failing to meet acceptance criteria shall be cause for re-evaluation of the processes and procedures used and requalification is required.

4.4.2.2 When a qualification sample is selected from a production lot, as defined in 3.1.9 fails to meet acceptance criteria, the entire lot shall be rejected.

4.4.2.3 Should the manufacturer choose to continue the qualification process with the same lot, the entire lot shall be reprocessed.

4.4.2.4 For reprocessed lots, all qualification tests shall be repeated. Should any of the qualification tests fail, the entire lot shall be rejected for the purpose of qualification to this specification.

4.4.2.5 If reprocessing results in any changes to the MPS, the MPS shall be revised to reflect the new process control variables.

4.5 Records of qualification

The following records are required to document the qualification of bolting:

- a) raw material specification number, edition and grade-API 6A718 or ASTM A453 Grade 660 Class D;
- b) heat number;

- c) raw material manufacturer;
- d) raw material refining method;
- e) product size;
- f) process control variables;
- g) manufacturing process specification;
- h) forming, as applicable;
- i) heat treatment;
- j) machining, as applicable;
- k) thread rolling, as applicable;
- l) record of test results, as applicable, in Section 4 and Section 5;
- m) inspection;
- n) personnel qualifications;
- o) test laboratory qualification; and
- p) records of qualification test failures and corrective action.

4.6 Limits of Bolting Qualification

4.6.1 BSL-2

The following are the limits of bolting qualification:

- a) A change of heat treat method (type of equipment, furnace control method, cooling methods) requires requalification.
- b) Change of raw material supplier.
- c) Change of machining or threading methods (type of equipment, control).
- d) Change of hot forming practice (type of equipment, heating method, temperature control method).

4.6.2 BSL-3

Limits of bolting qualification for BSL-3 shall be the same as BSL-2.

5 Production of Qualified Bolting

5.1 Qualification of Procurement Sources for Raw Material

5.1.1 Only sources for raw material that are approved by the bolting manufacturer are to be used to supply raw material. The bolting manufacturer shall have a documented procedure, fully implemented, for qualifying raw material suppliers for each grade and heat treat condition of material. The approval process shall be based on both a quality

assurance and a technical evaluation. The approval process shall establish the methodology by which the raw material supplier will be evaluated on an ongoing basis to maintain their status as an approved supplier.

5.1.2 In addition to the maintenance of a quality program meeting an applicable standard, such as API Q1 or ISO 9001, the raw material supplier shall maintain documented evidence of their technical capability to produce materials meeting this specification and shall have documented procedures that demonstrate their capability to consistently produce acceptable product. The methods for the technical approval of a raw material supplier for the two BSLs are the following:

a) BSL-2

Use of one or more of the following four methods:

- 1) raw material receipt inspection that includes NDE, chemistry check, microstructure, etc;
- 2) raw material first article evaluation to include independent verification of chemical composition, mechanical properties, and microstructure;
- 3) supplier experience over an extended period of time. Demonstration of acceptable experience shall include tests/inspections, quantity of material received, nonconformance analysis etc.;
- 4) on-site technical audits at scheduled 3 year intervals.

b) BSL-3

All of the four methods listed in 5.1.2.a) shall be used.

5.1.3 The bolting manufacturer is responsible for ensuring that a raw material supplier has implemented controls addressing the following for each grade of raw material ordered:

- a) chemistry controls;
- b) melting practice controls;
- c) pouring practice;
- d) hot work practice controls;
- e) heat treatment controls, as applicable;
- f) raw material inspection and acceptance criteria (cleanliness requirements, limitations on porosity or inclusions, grain size, secondary phases, microstructure, etc. as applicable);
- g) controls to assure that no welding was performed.

5.2 Material Specifications

5.2.1 The bolting manufacturer shall document raw material requirements in the form of a material specification. For BSL-2 this may be the applicable API or ASTM specification. For BSL-3, material specifications shall include as applicable per the referenced API or ASTM Standard:

- a) material grade, including element chemistry and allowable ranges;

- b) acceptable melt practices and ladle refinement;
- c) acceptable hot work reduction;
- d) acceptable microstructure (applicable to alloys covered by API 6A718 only);
- e) heat treatment requirements including mill heat treatments;
- f) acceptable inspection practices and criteria.

5.2.2 The bolting manufacturer shall document acceptance of incoming raw material to the requirements of the material specification prior to use in the production of bolting.

5.3 Manufacturing Process Specification (MPS)

5.3.1 General

The bolting manufacturer shall prepare a MPS to include, as minimum allowable levels for all bolting manufacturing parameters including the process control variables listed in 5.3.2 and the heat treatment parameters listed in 5.3.3.

5.3.2 General Variables

The following are general variables:

- a) heading equipment;
- b) hot forming heating method;
- c) hot forming temperature control method;
- d) machining and threading equipment: single point (lathe), multiple chaser, roll, tap;
- e) machining and threading control methods.

5.3.3 Heat Treatment Parameters

The following are heat treat parameters, as applicable:

- a) equipment (batch, continuous);
- b) times and temperatures;
- c) cooling media (e.g. water, oil, polymer, air, etc.);
- d) control and calibration methods;
- e) furnace loading (fixturing, separation of pieces).

5.4 Heat Treatment Requirements

5.4.1 BSL-2 Requirements

5.4.1.1 Heat Treatment shall be in accordance with the relevant API or ASTM standard.

5.4.1.2 Manufacturing processes shall be performed so as to avoid the introduction of stress risers that can occur from sharp angles and tool marks. Threads may be cut or rolled. Unified National Threads shall be "R" (UNR controlled radius root) series.

5.4.1.3 Furnace qualification shall be in accordance with API 6A, SAE AMS 2750, or SAE-AMS-H-6875.

5.4.2 BSL-3

Requirements specified for BSL-2 are required for BSL-3.

5.5 Raw Material

5.5.1 BSL-2

5.5.1.1 The metal shall have a fully wrought structure.

5.5.1.2 The reduction ratio based on starting material diameter shall be a minimum of 4.0:1.

5.5.1.3 The metal shall conform to the requirements of the relevant API or ASTM Standard.

5.5.1.4 All elements intentionally added to the heat shall be reported.

5.5.2 BSL-3

5.5.2.1 The requirements specified for BSL-2 are required for BSL-3.

5.5.2.2 In addition to the heat analysis performed by the mill, the bolting manufacturer shall perform a product analysis in accordance with ASTM A453 Grade 660 or API 6A718.

5.6 Chemical Analysis

Methods and practices relating to chemical analysis shall be in accordance with ASTM A751. The frequency for chemical analysis shall be one per heat. Results shall be documented on the test report.

5.7 Mechanical Properties

5.7.1 General

Mechanical properties testing shall be performed by the raw material supplier or bolting manufacturer after all thermal treatments including precipitation hardening as well as any strain hardening. All mechanical property tests required by the applicable API or ASTM standard shall be performed on each heat lot. Results shall be documented on the test report.

5.7.2 BSL-2

The results shall conform to the requirements of the relevant API or ASTM standard.

5.7.3 BSL-3

The requirements for BSL-2 are required for BSL-3. When any of the testing has been performed by the raw material supplier, the bolting manufacturer shall perform a retest.

5.8 Metallurgical Requirements

The microstructure of nickel alloys shall conform to the requirements of the API 6A718.

5.9 Examination and Test Requirements

When inspecting or testing production lots, a sample that fails to meet the applicable requirements shall result in rejection of the entire lot. The rejected lot shall be scrapped or reworked. In the case of rework, the entire lot shall be re-inspected or tested for the failed characteristic and any characteristic affected by rework.

Hardness testing, including specimen preparation, shall be performed in accordance with ASTM A370 including Annex A3 except that testing shall also be in conformance with ASTM E10 or E18. The hardness test shall conform to the requirements of API 6A718 or ASTM A453. Each piece shall be tested. Results shall be documented on the test report.

5.10 Nondestructive Examination (NDE) Requirements

5.10.1 BSL-2

NDE shall conform to the requirements of the referenced API or ASTM specification.

5.10.2 BSL-3

5.10.2.1 Surface NDE is required. Liquid penetrant examination is required for ASTM A453 Grade 660, and the alloys covered by API 6A718. Liquid penetrant examination shall be in accordance with ASTM A962 S56. Acceptance criteria shall be per ASTM A962 S57. Each piece shall be examined. Results shall be documented on an examination report.

5.10.2.2 Volumetric NDE is required on bar, rod, wire or on bolting 1 in. (25.4 mm) or greater nominal diameter prior to threading and after any heading operation. Ultrasonic examination shall be performed in conformance to the methods and acceptance criteria of API 6A, volumetric NDE examination of stems (PSL-3). Each piece shall be examined. Results shall be documented on the test report.

5.11 Dimensional Inspection and Visual Inspection

5.11.1 General

All dimensions shall meet the requirements of ASTM A962. Visual inspection shall be performed in accordance with ASTM F788 and ASTM F812. Dimensions not specified by ASTM A962 shall be as specified by the purchaser. Results shall be documented on an inspection report. Oversizing of nut threads or under sizing of bolt threads is not permissible.

5.11.2 BSL-2 Sample Size

Sample size shall be in accordance with Table 2.

5.11.3 BSL-3 Sample Size

Each piece shall be dimensionally inspected.

Table 2—Sampling for Dimensional and Visual Inspection

Lot Size	Sample Size
2 to 8	ALL
9 to 50	8
51 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1200	80
Based on ANSI/ASQ Z1.4 Table 1	General Inspection Level II
NOTE 1 Acceptance number is zero.	
NOTE 2 Sample shall be random.	

5.12 Final Positive Material Identification

5.12.1 General

Pieces shall be examined using methods conforming to ASTM E1476 and ASTM A751 to confirm the material type.

5.12.2 BSL-2 Sample Size

10 % of the pieces shall be examined. If any of the 10 % sample fail, the entire lot shall be examined.

5.12.3 BSL-3 Sample Size

Each piece shall be examined.

6 Calibration Systems

Inspection, measuring and testing equipment used for acceptance shall be identified, inspected, calibrated and adjusted at specific intervals in accordance with ANSI/NCSL Z540.3 and this specification. Calibration standards shall be traceable to the applicable national or international standards agency and shall be no less stringent than the requirements included herein. Inspection, measuring and testing equipment shall be used only within the calibrated range. Calibration intervals shall be established based on repeatability and degree of usage.

7 Test Report

The test report shall be supplied to the purchaser and shall include the following as applicable:

- mill chemistry;
- chemistry check analysis;
- hot work reduction ratio;
- heat treat procedure including times, temperatures and quench media;
- results of mechanical tests;

- results of microstructure evaluations;
- results of dimensional inspection;
- results of NDE inspections;
- BSL qualification level;
- certification that the product meets the requirements of this specification;
- additional certification requirements stated in 6A718 and A453.

8 Marking Requirements

8.1 Product Marking

Product marking for Grade 660D shall be in accordance with ASTM A453 for Grade 660D. Product marking for API 6A718 shall consist of the manufacturer's identification and "6A718" as the grade identification.

8.2 Additional Marking Required by this Standard

Bolting shall be marked with unique heat lot identification and the following:

- a) "API 20F-2" for BSL-2,
- b) "API 20F-3" for BSL-3.

Each piece 1 in. (25.4 mm) nominal diameter and larger shall be marked. For bolting less than 1 in. (25.4 mm) nominal diameter, the bolting shall be securely containerized to maintain heat lot identification and traceability. Multiple heat lots shall not be mixed in a single container. Containers used in the processing, storing and shipping of bolting not individually marked shall be clearly labeled with all marking information required by the ASTM specification and this standard.

9 Record Retention

The bolting manufacturer shall establish and maintain documented procedures to control all documents and data required by this specification. Records required by this specification shall be maintained for a minimum of 10 years from the date of manufacture. Documents and data may be in any type of media (hard copy or electronic) and shall be:

- maintained to demonstrate conformance to specified requirements;
- legible;
- retained and readily retrievable;
- stored in an environment to prevent loss.

10 Storage and Shipping

Bolting shall be packaged for storage and shipping in accordance with the written specifications of the bolting manufacturer.

Annex A **(informative)**

API Monogram Program

A.1 Scope

The API Monogram® is a registered certification mark owned by the American Petroleum Institute (API) and authorized for licensing by the API Board of Directors. Through the API Monogram Program, API licenses product manufacturers to apply the API Monogram to new products which comply with product specifications and have been manufactured under a quality management system that meets the requirements of API Q1. API maintains a complete, searchable list of all Monogram licensees on the API Composite List website (www.api.org/compositelist).

The application of the API Monogram and license number on products constitutes a representation and warranty by the licensee to API and to purchasers of the products that, as of the date indicated, the products were manufactured under a quality management system conforming to the requirements of API Q1 and that the product conforms in every detail with the applicable standard(s) or product specification(s). API Monogram program licenses are issued only after an on-site audit has verified that an organization has implemented and continually maintained a quality management system that meets the requirements of API Q1 and that the resulting products satisfy the requirements of the applicable API product specification(s) and/or standard(s). Although any manufacturer may claim that its products meet API product requirements without monogramming them, only manufacturers with a license from API can apply the API Monogram to their products.

Together with the requirements of the API Monogram license agreement, this annex establishes the requirements for those organizations who wish to voluntarily obtain an API license to provide API monogrammed products that satisfy the requirements of the applicable API product specification(s) and/or standard(s) and API Monogram Program requirements.

For information on becoming an API Monogram Licensee, please contact API, Certification Programs, 1220 L Street, N. W., Washington, DC 20005 or call 202-682-8145 or by email at certification@api.org.

A.2 Normative References

API Specification Q1, *Specification for Quality Management System Requirements for Product Manufacturing for the Petroleum and Natural Gas Industry*

A.3 Terms and Definitions

For purposes of this annex, the following terms and definitions apply:

A.3.1

API monogrammable product

Product that has been newly manufactured by an API licensee utilizing a fully implemented API Q1 compliant quality management system and that meets all the API specified requirements of the applicable API product specification(s) and/or standard(s).

A.3.2

API specified requirements

Requirements, including performance and licensee-specified requirements, set forth in API Q1 and the applicable API product specification(s) and or standard(s).

NOTE Licensee-specified requirements include those activities necessary to satisfy API specified requirements.

A.3.3**API product specification**

Prescribed set of rules, conditions, or requirements attributed to a specified product which address the definition of terms; classification of components; delineation of procedures; specified dimensions; manufacturing criteria; material requirements, performance testing, design of activities; and the measurement of quality and quantity with respect to materials; products, processes, services, and/or practices.

A.3.4**licensee**

Organization that has successfully completed the application and audit process and has been issued a license by API.

A.3.5**design package**

Records and documents required to provide evidence that the applicable product has been designed in accordance with API Q1 and the requirements of the applicable product specification(s) and/or standard(s).

A.4 Quality Management System Requirements

An organization applying the API Monogram to products shall develop, maintain, and operate at all times a quality management system conforming to API Q1.

A.5 Control of the Application and Removal of the API Monogram

Each licensee shall control the application and removal of the API Monogram in accordance with the following:

- a) Products that do not conform to API specified requirements shall not bear the API Monogram.
- b) Each licensee shall develop and maintain an API Monogram marking procedure that documents the marking/monogramming requirements specified by this annex and any applicable API product specification(s) and/or standard(s). The marking procedure shall:
 - 1) define the authority responsible for application and removal of the API Monogram;
 - 2) define the method(s) used to apply the API Monogram;
 - 3) identify the location on the product where the API Monogram is to be applied;
 - 4) require the application of the licensee's license number and date of manufacture of the product in conjunction with the use of the API Monogram;
 - 5) require that the date of manufacture, at a minimum, be two digits representing the month and two digits representing the year (e.g. 05-12 for May 2012) unless otherwise stipulated in the applicable API product specification(s) or standard(s); and
 - 6) require application of the additional API product specification(s) and/or standard(s) marking requirements.
- c) Only an API licensee may apply the API Monogram and its designated license number to API monogramable products.
- d) The API Monogram license, when issued, is site-specific and subsequently the API Monogram shall only be applied at that site specific licensed facility location.

- e) The API Monogram may be applied at any time appropriate during the production process but shall be removed in accordance with the licensee's API Monogram marking procedure if the product is subsequently found to be out of conformance with any of the requirements of the applicable API product specification(s) and/or standard(s) and API Monogram Program.

For certain manufacturing processes or types of products, alternative API Monogram marking procedures may be acceptable. Requirements for alternative API Monogram marking are detailed in the API Policy, *API Monogram Program Alternative Marking of Products License Agreement*, available on the API Monogram Program website at <http://www.api.org/alternative-marking>.

A.6 Design Package Requirements

Each licensee and/or applicant for licensing must maintain a current design package for all of the applicable products that fall under the scope of each Monogram license. The design package information must provide objective evidence that the product design meets the requirements of the applicable and most current API product specification(s). The design package(s) must be made available during API audits of the facility.

In specific instances, the exclusion of design activities is allowed under the Monogram Program, as detailed in *Advisory # 6*, available on API Monogram Program website at <http://www.api.org/advisories>.

A.7 Manufacturing Capability

The API Monogram Program is designed to identify facilities that have demonstrated the ability to manufacture equipment that conforms to API specifications and/or standards. API may refuse initial licensing or suspend current licensing based on a facility's level of manufacturing capability. If API determines that additional review is warranted, API may perform additional audits (at the organization's expense) of any subcontractors to ensure their compliance with the requirements of the applicable API product specification(s) and/or standard(s).

A.8 API Monogram Program: Nonconformance Reporting

API solicits information on products that are found to be nonconforming with API specified requirements, as well as field failures (or malfunctions), which are judged to be caused by either specification deficiencies or nonconformities with API specified requirements. Customers are requested to report to API all problems with API monogrammed products. A nonconformance may be reported using the API Nonconformance Reporting System available at <http://compositelist.api.org/ncr.asp>.

Bibliography

- [1] ASTM A193-15 *Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications*, 2015



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