The Importance of Oil and Gas Fastener Certifications

AN ALL-PRO FASTENERS WHITEPAPER

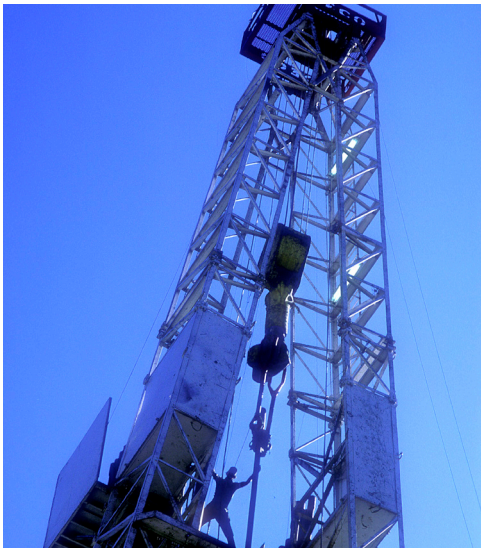
Since 1924, the American Petroleum Institute (API) has been leading the effort to establish and maintain quality and performance standards for the oil and gas industry. These standards have enhanced the reliability and safety of operations throughout the oil and gas industry, through the consistent application of quality and performance criteria. What's more, API standards have provided a consistent means for companies to advance and evaluate technical knowledge and skills based on individual certification programs.[1]

API Monogram™ Licensing Program

The API Monogram program is a voluntary licensing program that supports the consistent manufacturing of products that conform to applicable API Specifications. Licensed manufacturers are authorized to apply the API Monogram registered mark to equipment, parts, and components that meet applicable API quality and performance standards. Buyers have the confidence of knowing that parts and components being purchased meet applicable and expected standards of quality.

The API Monogram program permits licensed manufacturers to apply the API Monogram registered mark, so that the product is easily identifiable and traceable back to the time and place of manufacturing.

Licenses are issued following an on-site audit which verifies conformance to applicable product specifications as well as management requirements. Audits are conducted at each three-year licensing renewal interval, or annually if the manufacturer also holds an APIQR management system registration.



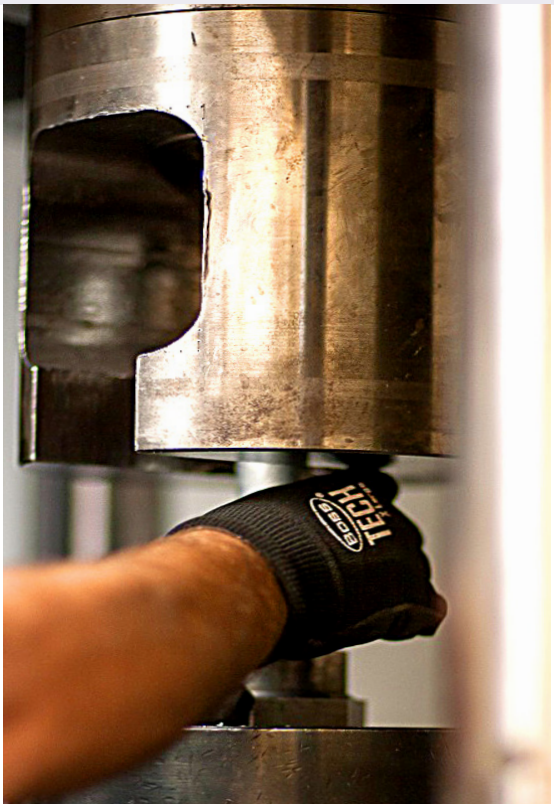
APIQR Program

APIQR is the American Petroleum Institute's Quality Registrar Program. Through APIQR, registered manufacturers (or other organizations) are noted to operate a quality management system that conforms to API Spec Q1, API Spec Q2, ISO 9001, ISO 14001, and/or OHSAS 18001.

The APIQR program is accredited by the ANSI-ASQ National Accreditation Board (ANAB) as a certification body, in conformance with ISO 17021-1:2015, allowing the program to provide certifications of management systems in accordance with ISO 9001 and ISO 14001.

API Fastener Specifications for the Oil & Gas Industry

The API's 20E and 20F monogram programs are regarded as representing the most demanding fastener performance specifications in the oil and gas industry. The development of these monogram programs has contributed significantly to the safety and reliability of a wide range of oil and gas joining operations.



20E – Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries

With API Specification 20E, the American Petroleum Institute establishes manufacturing requirements for three (3) bolting specification levels: BSL-1, BSL-2, and BSL-3. These sequential bolting designations reflect increasingly stringent levels of technical performance, quality, and qualification criteria.
The product categories covered under API Specification 20E include:

a) machined studs
b) machined bolts, screws, and nuts
c) cold formed bolts, screws, and nuts (BSL-1 only)
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) or greater nominal diameter
f) roll threaded studs, bolts, and screws <1.5 in. (38.1 mm) nominal diameter
g) roll threaded studs, bolts, and screws 1.5 in. (38.1 mm) or greater nominal diameter
h) hot formed nuts <.5 in. (38.1 mm) nominal diameter
i) hot formed nuts 1.5 in. (38.1 mm) or greater nominal diameter

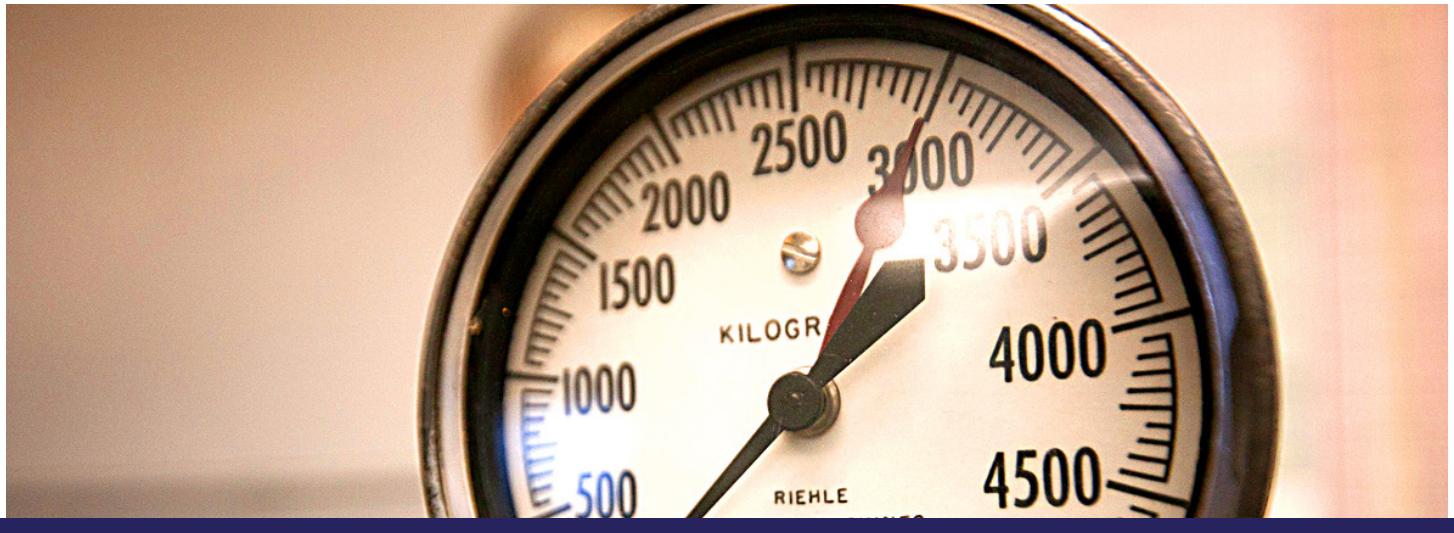
Bolting Specification Levels for API 20E

The three bolting specifications provided by API 20E provide progressively rigorous bolting standards.

BSL-1 is the bolting specification level to which every fastener should conform. Manufacturing and coating processes are audited to ensure that specifications are met. Products are marked with the BSL-1 bolting specification level designation. Precise documentation, storage and shipping requirements are followed.

BSL-2 is the next bolting specification level, using non-destructive surface and ultrasonic testing to confirm bolt integrity.

BSL-3 is the most rigorous bolting specification level of API Specification 20E. BSL-3 prohibits continuous casting manufacturing and includes additional, increasingly rigorous testing requirements.

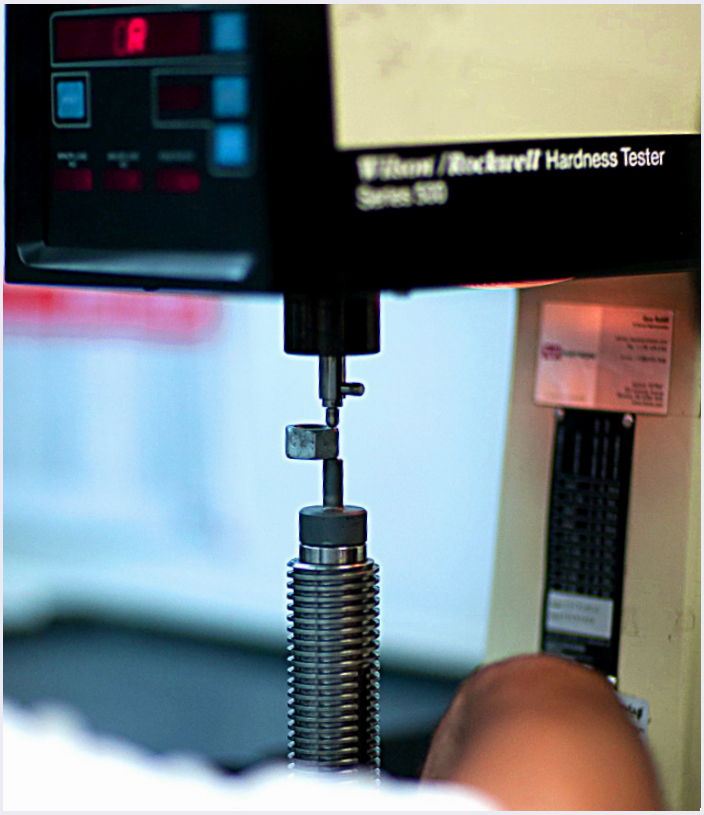


20F – Corrosion Resistant Bolting

API Specification 20F specifies requirements for the qualification, production, and documentation of corrosion-resistant bolting used in the petroleum and natural gas industries.

API Specification 20F covers the following product forms, processes, and sizes:

a) machined studs
b) machined bolts, screws, and nuts
c) cold formed bolts, screws, and nuts with cutor cold-formed threads
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



Bolting Specification Levels for API 20F

Two (2) bolting specification levels (BSL) are designated in API Specification 20F: BSL-2 and BSL-3.

These two BSL designations define increasingly higher levels of technical, quality, and qualification requirements: BSL-2 and BSL-3 are intended to be comparable to BSL-2 and BSL-3 as found in API 20E. The nominal BSL-1 is omitted from this standard.

What the API 20E and 20F Monograms Mean for the Oil and Gas Insustry

Through its API 20E and 20F specifications, the American Petroleum Institute provides effective tools to guide the specification, manufacturing, and quality control of bolting products used within the oil and gas industry. This ensures that products marked with the 20E and 20F monograms are manufactured according to strict standards, and that the company's products and processes are evaluated according to designated testing levels. It also ensures that the manufacturer is committed to best practices in record keeping, storage, and shipment, adhering to appropriate safety protocols throughout the supply chain.

Monogram licenses are only issued once an on-site audit by API has verified the company's conformance to product specifications as well as stringent management system requirements. Audits are then conducted upon renewal, which is every three years, or on an annual basis if the organization also holds a management system registration through the APIQR Program.

At a minimum, the Licensee must implement, maintain, and continually improve their quality management system to meet the requirements of API Spec Q1, although Q1 certification is not required.

According to the American Petroleum Institute itself, here's what the API 20E and 20F monograms mean to API, manufacturers, and end-users:[2]

To API:

- The Monogram Mark is a protected trademark
- Legally enforceable program requirements through contract agreements with the Licensees
- The mark can only be applied to new, conforming product, manufactured by the Licensed organization at the Licensed facility
- Industry initiative that supports its commitment to improve safety and reliability of oil and gas industry equipment and operations

To Manufacturers:

- A way to be recognized by API and industry for product quality
- Recognition of their capability to manufacture products that meet API specifications
- A means to physically mark and identify conforming products

To Equipment Purchasers and End-Users:

- Purchasers have verification that the products meet the requirements of the API specifications and standards
- Manufacturers have implemented a management system that provides assurances that processes have been implemented to provide consistent, conforming products
- Manufacturers have implemented processes and controls to identify and address customer requirements, customer complaints, and product issues
- Purchasers have a method to trace products back to the original manufacturer, design, and performance requirements
- Customers have the means to report industry product and process issues and nonconformities
- Visible identification in the field shows that a product was manufactured to conform to an API product specification or standard
- Purchasers have a sense of security knowing that whatever they are joining will be joined by fasteners that are manufactured and tested to the highest standards of quality and reliability

In Conclusion

The American Petroleum Institute's (API's) certifications have long been regarded as the standard for fastener performance in the oil and gas industry. The broad adoption of these certifications has contributed significantly to the safety and reliability of a wide range of oil and gas joining applications.

With its API Specifications 20E and 20F, the American Petroleum Institute provides rigorous performance and testing criteria for alloy and carbon steel bolting, as well as corrosion resistant bolting used in the oil and natural gas industry.

The API's 20E and 20F Monogram Programs require manufacturers to comply with stringent manufacturing, quality control, and testing procedures in the manufacture and distribution of bolting products. Licenses are issued following an on-site audit which verifies conformance to applicable product specifications and management requirements.

Licensed manufacturers are authorized to apply the API Monogram registered mark to equipment, parts, and components that meet applicable API quality and performance standards. This gives buyers the confidence of knowing that parts and components being purchased meet applicable and expected standards of quality.

FOOTNOTES

1 American Petroleum Institute
https://www.api.org/products-and-services/standards/program-information

2 American Petroleum Institute
https://www.api.org/