# Lubrication, Shaft-sealing, and Oil-control Systems and Auxiliaries

API STANDARD 614
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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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## Introduction

API 614 is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This may be particularly appropriate where there is innovative or developing technology. Where an alternative is offered, the vendor should identify any variations from API 614 and provide details.

API 614 requires the purchaser to specify certain details and features.

A bullet (●) at the beginning of a section or subsection indicates that either a decision is required or further information is to be provided by the purchaser. This information should be indicated in the data sheets; otherwise, it should be stated in the quotation request or in the purchase order.

A diamond (♦) at the beginning of a section or subsection indicates that the feature is required for unspared equipment in critical service.

NOTE Sections and subsections preceded by a diamond (♦) are those features and requirements described as "special purpose" oil systems in previous editions of API 614.

In this International Standard, United States customary units are included in parentheses for information.

Annex A.1 contains a site and utility data sheet.

Annex A.2 contains oil system data sheets.

Annex B contains symbols used in piping and instrument diagrams and figures.

Annex C contains piping and instrument diagrams.

Annex D contains contract documents and engineering design data.

Annex E provides guidance on oil filter performance and oil-system cleanliness testing.

Annex F contains international materials specifications.

Annex G provides an explanation of reservoir levels.

Annex H contains diagrams of typical lubrication, oil-type shaft-sealing, and oil-control systems.

Annex I provides guidance on oil drain line sizing.

Annex J contains an inspector's checklist.

Annex K contains a guide to system reliability.

Annex L provides guidance on varnish and electrostatic discharge.

# Lubrication, Shaft-sealing, and Oil-control Systems and Auxiliaries

## 1 Scope

API 614 covers the minimum requirements for lubrication systems, oil-type shaft-sealing systems, oil-control systems, and auxiliaries, excluding dry gas seal systems and fuel systems. These systems can serve individual equipment such as compressors, gears, pumps, and drivers or complete trains. API 614 does not apply to dry gas seal systems. For dry gas seal systems, refer to API 692.

NOTE For high-pressure oil systems and fuel systems used on gas turbines, refer to API 616.

## 2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 shall become mandatory upon the effective date specified by the publisher or 6 months from the date of the revision (where no effective date is specified).

API Standard 520 (all parts), *Sizing, Selection, and Installation of Pressure-relieving Devices*

API Standard 526, *Flanged Steel Pressure-relief Valves*

API Standard 547, *General Purpose Form-wound Squirrel Cage Induction Motors—185 kW (250 hp) through 2240 kW (3000 hp)*

API Recommended Practice 551, *Process Measurement*

API Recommended Practice 578, *Guidelines for a Material Verification Program (MVP) for New and Existing Assets*

API Standard 594, *Check Valves: Flanged, Lug, Wafer, and Butt-welding*

API Standard 600, *Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets*

API Standard 602, *Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries*

API Standard 610, *Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries*

API Standard 611, *General-purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services*

API Standard 660, *Shell-and-Tube Heat Exchangers*

API Standard 661, *Petroleum, Petrochemical, and Natural Gas Industries—Air-cooled Heat Exchangers*

API Standard 670, *Machinery Protection Systems*

API Standard 676, *Positive Displacement Pumps—Rotary*

API Recommended Practice 686, *Recommended Practice for Machinery Installation and Installation Design*

API Recommended Practice 691, *Risk-based Machinery Management*

API Standard 692, *Dry Gas Sealing Systems for Axial, Centrifugal, and Rotary Screw Compressors and Expanders*

ANSI B11.19 [1], *Performance Requirements for Risk Reduction Measures: Safeguarding and Other Means of Reducing Risk*

ANSI/AGMA 9000-D11 [2], *Flexible Couplings—Potential Unbalance Classification*

ANSI/AGMA 9002-B04 (R2011), *Bores and Keyways for Flexible Couplings (Inch Series)*

ASME B1.1 [3], *Unified Inch Screw Threads (UN, UNR, and UNJ Thread Forms)*

ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*

ASME B16.1, *Grey Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250*

ASME B16.5, *Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard*

ASME B16.11, *Forged Fittings, Socket-Welding and Threaded*

ASME B16.42, *Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300*

ASME B16.47, *Large Diameter Steel Flanges: NPS 26 Through NPS 60 Metric/Inch Standard*

ASME B31.3, *Process Piping*

ASME B73.1, *Specification for Horizontal End Suction Centrifugal Pumps for Chemical Process*

ASME B73.2, *Specification for Vertical In-line Centrifugal Pumps for Chemical Process*

ASME *Boiler and Pressure Vessel Code*, *Section V: Nondestructive Examination*

ASME *Boiler and Pressure Vessel Code*, *Section VIII: Rules for Construction of Pressure Vessels, Division 1*

ASME Y14.2, *Line Conventions and Lettering*

ASTM A193/A193M [4], *Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications*

ASTM A194/A194M, *Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both*

ASTM A240/A240M, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

ASTM A388/A388M, *Standard Practice for Ultrasonic Examination of Steel Forgings*

ASTM A578/A578M, *Standard Specification for Straight-Beam Ultrasonic Examination of Rolled Steel Plates for Special Applications*

ASTM A609/A609M, *Standard Practice for Castings, Carbon, Low-Alloy, and Martensitic Stainless Steel, Ultrasonic Examination Thereof*

ASTM D5445-15, *Standard Practice for Pictorial Markings for Handling of Goods*

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1 American National Standards Institute, 1899 L Street, NW, Washington, District of Columbia 20036, https://ansi.org.

2 American Gear Manufacturers Association, 1001 N. Fairfax Street, Suite 500, Alexandria, Virginia 22314, www.agma.org.

3 American Society of Mechanical Engineers, Two Park Avenue, New York, New York 10016, www.asme.org.

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

ASTM E94/E94M, *Standard Guide for Radiographic Examination Using Industrial Radiographic Film*

ASTM E165/E165M, *Standard Practice for Liquid Penetrant Testing for General Industry*

ASTM E709, *Standard Guide for Magnetic Particle Testing*

ASTM E1003, *Standard Practice for Hydrostatic Leak Testing*

AWS D1.1/D1.1M [5], *Structural Welding Code—Steel*

EN 1092-1 [6], *Flanges and their joints—Circular flange for pipes, valves, fittings and accessories, PN designated—Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints—Circular flange for pipes, valves, fittings and accessories, PN designated—Part 2: Cast iron flanges*

EN ISO 3452-1, *Non-destructive testing od welds—Penetrant testing—General principles*

EN 10675-1, *Non-destructive testing of welds—Acceptance levels for radiographic testing—Steel, nickel, titanium and their alloys*

EN ISO 11666, *Non-destructive testing of welds—Ultrasonic testing—Acceptance levels*

EN ISO 17636-1, *Non-destructive testing of welds—Radiographic testing—X- and gamma-ray techniques with film*

EN ISO 17636-2, *Non-destructive testing of welds—Radiographic testing—X- and gamma-ray techniques with digital detectors*

EN ISO 17637, *Non-destructive testing of welds—Visual testing of fusion-welded joints*

EN ISO 17638, *Non-destructive testing of welds—Magnetic particle testing*

EN ISO 17640, *Non-destructive testing of welds—Ultrasonic testing—Techniques, testing levels and assessment*

EN ISO 23277, *Non-destructive testing of welds—Penetrant testing—Acceptance levels*

EN ISO 23278, *Non-destructive testing of welds—Magnetic particle testing—Acceptance levels*

EN ISO 23279, *Non-destructive testing of welds—Ultrasonic testing—Characterization of discontinuities in welds*

IEC 60079 (all parts) [7], *Explosive atmospheres*

IEC 60529, *Degrees of protection provided by enclosures (IP code*)

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5 American Welding Society, 8669 NW 36 Street, # 130, Miami, Florida 33166, www.aws.org.

6 European Committee for Standardization (CEN), Management Centre, Rue de la Science 23, B - 1040 Brussels, Belgium, https://www.cen.eu.

7 International Electrotechnical Commission, 3 Rue de Varembé, CH-1211, Geneva 20, Switzerland, www.iec.ch.