
Petroleum, petrochemical and natural gas industries - Lubrication, shaft-sealing and control-oil systems and auxiliaries - Part 1: General requirements (ISO 10438-1:2003)

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Erdöl-, petrochemische und Ergasindustrie - Schmieröl-, Sperröl und Regelölversorgungsanlagen und Hilfsanlagen Teil 1: Allgemeine Anforderungen (ISO 10438-1:2003)

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Industries du pétrole, de la pétrochimie et du gaz naturel - Systemes de lubrification, systemes d'étanchéité, systemes d'huile de régulation et leurs auxiliaires - Partie 1: Exigences générales (ISO 10438-1:2003)

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English version

Petroleum, petrochemical and natural gas industries -
Lubrication, shaft-sealing and control-oil systems and auxiliaries
- Part 1: General requirements (ISO 10438-1:2003)

Industries du pétrole, de la pétrochimie et du gaz naturel -
Systèmes de lubrification, systèmes d'étanchéité, systèmes
d'huile de régulation et leurs auxiliaires - Partie 1:
Exigences générales (ISO 10438-1:2003)

This European Standard was approved by CEN on 2 December 2003.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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Foreword

This document (EN ISO 10438-1:2003) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum and natural gas industries", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

NOTE FROM CMC The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

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Endorsement notice

The text of ISO 10438-1:2003 has been approved by CEN as EN ISO 10438-1:2003 without any modifications.

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**Petroleum, petrochemical and natural gas
industries — Lubrication, shaft-sealing
and control-oil systems and auxiliaries —**

**Part 1:
General requirements**

iTeh STANDARD PREVIEW
*Industries du pétrole, de la pétrochimie et du gaz naturel — Systèmes
de lubrification, systèmes d'étanchéité, systèmes d'huile de régulation
et leurs auxiliaires*
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Partie 1: Exigences générales

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 10438-1 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures, for the petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

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ISO 10438 consists of the following parts, under the general title *Petroleum, petrochemical and natural gas industries — Lubrication, shaft-sealing and control-oil systems and auxiliaries*:

- *Part 1: General requirements* [SIST EN ISO 10438-1:2004](https://standards.iteh.ai/catalog/standards/sist/fla83c44-5142-42c2-bcfc-5647d79a097c/sist-en-iso-10438-1-2004)
- *Part 2: Special-purpose oil systems*
- *Part 3: General-purpose oil systems*
- *Part 4: Self-acting gas seal support systems*

Introduction

ISO 10438 is based on API Std 614, 4th edn., April 1999, divided into four parts as follows:

- *Part 1: General requirements* (this part) is based on Chapter 1 of API Std 614;
- *Part 2: Special-purpose oil systems* is based on Chapter 2 of API Std 614;
- *Part 3: General-purpose oil systems* is based on Chapter 3 of API Std 614;
- *Part 4: Self-acting gas seal support systems* is based on Chapter 4 of API Std 614.

Users of this part of ISO 10438 should be aware that further or differing requirements may be needed for individual applications. This part of ISO 10438 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 this part of ISO 10438 and provide details.

This part of ISO 10438 requires the purchaser to specify certain details and features.

A bullet (•) at the beginning of a clause or sub-clause indicates that either a decision is required or further information is to be provided by the purchaser. This information or decision should be indicated on suitable data sheets; otherwise it should be stated in the quotation request (inquiry) or in the order.

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Petroleum, petrochemical and natural gas industries — Lubrication, shaft-sealing and control-oil systems and auxiliaries —

Part 1: General requirements

1 Scope

This part of ISO 10438 specifies general requirements for lubrication, shaft-sealing systems and control-oil systems and auxiliaries for use in the petroleum, petrochemical and natural gas industries as well as in other industries by agreement. It is intended to be used in conjunction with ISO 10438-2, ISO 10438-3 and ISO 10438-4, as appropriate. ISO 10438 in its entirety specifies requirements for lubrication systems, oil-type shaft-sealing systems, self-acting gas seal systems, control-oil systems and other auxiliaries for general- and special-purpose applications. These systems can serve equipment such as compressions, gears, pumps and drivers.

None of the parts of ISO 10438 is applicable to internal combustion engines.

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.

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designations*

ISO 7005 (all parts), *Metallic flanges*

ISO 10437, *Petroleum, petrochemical and natural gas industries — Steam turbines — Special-purpose applications*

ISO 13706, *Petroleum and natural gas industries — Air-cooled heat exchangers*

ISO 16812, *Petroleum and natural gas industries — Shell-and-tube heat exchangers*

IEC 60072 (all parts), *Dimensions and output series for rotating electrical machines*

IEC 60079 (all parts), *Electrical apparatus for explosive gas atmospheres*

API RP 520, Parts I and II, *Sizing, selection and installation of pressure-relieving devices in refineries*

API Std 526, *Flanged steel pressure relief valves*

API RP 551, *Process measurement instrumentation*

API Std 611, *General-purpose steam turbines for petroleum, chemical, and gas industry services*

ASME B1.1, *Unified inch screw threads (UN and UNR thread form)*

ISO 10438-1:2003(E)

ASME B16.11, *Forged fittings, socket-welding and threaded*

ASME Y14.2M, *Line conventions and lettering*

ASTM A 193, *Standard specification for alloy-steel and stainless steel bolting materials for high-temperature service*

ASTM A 194, *Standard specification for carbon and alloy steel nuts for bolts for high-pressure or high-temperature service, or both*

ASTM E 94, *Standard guide for radiographic examination*

ASTM E 125, *Standard reference photographs for magnetic particle indications on ferrous castings*

ASTM E 709, *Standard guide for magnetic particle examination*

NFPA 70:2002, *National electrical code*

TEMA, *Standards of the Tubular Exchanger Manufacturers Association*, 8th edn.

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms, definitions and abbreviated terms apply.

3.1 Terms and definitions

3.1.1

alarm point

preset value of a parameter at which an alarm warns of a condition requiring corrective action

3.1.2

block-in time

period required after the driver is tripped to isolate a piece of equipment, such as a compressor, from its system and to de-pressurize it

3.1.3

booster pump

oil pump that takes suction from the discharge of another pump to provide oil at a higher pressure

3.1.4

coast-down time

period required after the driver is tripped for the equipment to come to rest

3.1.5

component

machinery and hardware item, such as reservoir, pump, cooler, filter, valve and instrument, that is part of the system

3.1.6

console

total system whose components and controls are packaged as a single unit on a continuous or joined baseplate

NOTE With a console, the purchaser needs only to make external connections.

3.1.7**continuous-flow transfer valve**

valve that can simultaneously divert both inlet and outlet flows from one component to its installed spare equipment without altering the continuity of full flow through the transfer valve to the equipment

3.1.8**control oil**

oil required to operate such components as relays, servomotors and power pistons on the main equipment

3.1.9**cool-off time**

period during which oil has to be circulated through the equipment to prevent heat damage after the driver is tripped

3.1.10**emergency oil pump**

separate oil pump that provides adequate pressure and capacity to permit safe shutdown of the equipment when the main and standby pumps are inoperable

3.1.11**equipment**

main machinery served by the oil or gas system

3.1.12**gas seal module**

arrangement of piping, filters and instrumentation used to control and monitor the pressure or flow of seal, buffer, or separation gas to the equipment shaft-end seals

3.1.13**gauge board**

un-enclosed bracket or plate used to support and display gauges, switches and other instruments

3.1.14**general purpose**

application that is usually spared or is in non-critical service

3.1.15**local**

mounted on or near the equipment or console

3.1.16**main oil pump**

oil pump that is normally in operation

3.1.17**maximum allowable temperature**

maximum continuous temperature for which the manufacturer has designed the equipment (or any part to which the term refers) when handling the specified fluid at the specified pressure

3.1.18**maximum allowable working pressure**

maximum continuous pressure for which the manufacturer has designed the console or components when handling the specified fluid at the maximum allowable temperature

3.1.19**maximum sealing pressure**

highest pressure expected at the seals during any specified static or operating conditions and during start-up and shutdown

NOTE Considerations should include both relief valve settings and relief-valve accumulation pressure.

3.1.20

multiple-package arrangement

total oil supply system whose components are separated into individually packaged units

NOTE With this arrangement, the purchaser need only install the interconnections between the packages and the external connections.

3.1.21

normal flow

total amount of oil required by equipment components such as bearings, seals, couplings, and steady-state controls excluding transient flow for controls or oil by-passed directly back to the reservoir

3.1.22

normal operating point

point at which normal operation is expected and optimum efficiency is desired

NOTE This point is usually the point at which the vendor certifies that the performance is within the tolerances stated in the relevant standard.

3.1.23

normal seal gas flow

total amount of seal gas required by the equipment seals excluding transient gas flows or by-pass flows

3.1.24 device position

3.1.24.1

normally open

de-energized position of a device (e.g. automatically controlled electric switch or valve) remaining in an open position during operation unless energized

NOTE During operation of the equipment, the positions of these devices are not necessarily the same as their on-the-shelf positions.

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3.1.24.2

normally closed

de-energized position of a device (e.g. automatically controlled electric switch or valve) remaining in a closed position during operation unless energized

NOTE During operation of the equipment, the positions of these devices are not necessarily the same as their on-the-shelf positions.

3.1.25

package

total system, or part of a system, whose components are mounted on a single baseplate

NOTE A package is complete in all respects, including controls and instrumentation.

3.1.26

panel

enclosure used to mount, display and protect gauges, switches and other instruments

3.1.27

pipng system design code

recognized pipng system design standard specified or agreed by the purchaser

EXAMPLE ASME B31.3

3.1.28

pressure design code

recognized pressure vessel design standard specified or agreed by the purchaser

EXAMPLE ASME BPVC-VIII

3.1.29**primary seal gas**

dry, filtered gas supplied to the high pressure side of a self-acting gas seal

NOTE Primary seal gas is either supplied from the compressor discharge or from an external source. When supplied from an external source, it is referred to as seal buffer gas (see 3.1.32).

3.1.30**remote**

located away from the equipment or the console, typically in a control house

3.1.31**seal barrier gas**

clean gas supplied to the area between the seals of a dual seal arrangement at a pressure higher than the process pressure

3.1.32**seal buffer gas**

clean gas supplied to the high pressure side of a seal

3.1.33**seal gas leakage**

gas which flows from the high pressure side of the seal to the low pressure side of the seal

3.1.34**secondary-seal seal gas**

clean purge gas supplied to the area between the seals of a tandem self-acting gas seal having an intermediate labyrinth

NOTE This gas is at a pressure lower than the process pressure.

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3.1.35**self-acting gas seal system**

self-acting gas seal module and all other components necessary for operation of the self-acting gas seal

3.1.36**self-acting gas seal module**

arrangement of components on a skid or a rack used to support the self-acting gas seal

3.1.37**separation gas**

supply of inert gas or air fed into the region between the seal and the shaft bearing

3.1.38**settling-out pressure**

maximum pressure the system can reach under static conditions

3.1.39**shaft-driven pump**

oil pump driven by the shaft of one of the main machines served by the oil system

3.1.40**shutdown point**

preset value of a parameter at which automatic or manual shutdown of the system is required

3.1.41**special-purpose application**

application for which the equipment is designed for uninterrupted, continuous operation in critical service and for which there is usually no spare equipment