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**Erdöl-, petrochemische und Erdgasindustrie –
Schmieröl-, Sperröl- und Regelölversorgungsanlagen und
Hilfsanlagen –
Teil 4: Sperrgasversorgungsanlagen (ISO 10438-4:2007);
Englische Fassung EN ISO 10438-4:2007, mit CD-ROM**

Petroleum, petrochemical and natural gas industries –
Lubrication, shaft-sealing and control-oil systems and auxiliaries –
Part 4: Self-acting gas seal support systems (ISO 10438-4:2007);
English version EN ISO 10438-4:2007, with CD-ROM

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 4: Systèmes de soutien pour les étanchéités au gaz autoactionnées
(ISO 10438-4:2007);

Version anglaise EN ISO 10438-4:2007, avec CD-ROM

Gesamtumfang 34 Seiten

Normenausschuss Erdöl- und Erdgasgewinnung (NÖG) im DIN
Normenausschuss Maschinenbau (NAM) im DIN

Nationales Vorwort

Dieses Dokument (EN ISO 10438-4:2007) wurde vom ISO/TC 67 „Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries“, Subkomitee SC 6 „Processing equipment and systems“, in Zusammenarbeit mit dem Technischen Komitee CEN/TC 12 „Materialien, Ausrüstungen und Offshore-Bauwerke für die Erdöl-, petrochemische und Erdgasindustrie“ (Sekretariat AFNOR, Frankreich) erarbeitet.

Für Deutschland hat hieran der Arbeitsausschuss NA 109-00-01 AA „Materialien, Ausrüstungen und Offshore-Bauwerke für die Erdöl-, petrochemische und Erdgasindustrie — Spiegelausschuss zu CEN/TC 12 und ISO/TC 67“ im Normenausschuss Erdöl- und Erdgasgewinnung (NÖG) des DIN Deutsches Institut für Normung e. V. mitgearbeitet.

Diese Europäische Norm enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 1/2004 nur die englische Originalfassung der ISO Norm.

Diese Norm enthält neben den gesetzlichen Einheiten auch die Einheiten „°F“, „in (inch)“ und „psi“, die im Deutschen Normenwerk nicht zugelassen sind. Es wird ausdrücklich darauf hingewiesen, dass die Anwendung dieser Einheiten im nationalen amtlichen und geschäftlichen Verkehr aufgrund des Gesetzes über Einheiten im Messwesen nicht zulässig ist.

Umrechnung:

Nicht-SI-Einheit	SI-Einheit	Umrechnung	
°F	°C	°C	= (5/9) (°F-32)
in (inch)	mm	1 in	= 25,4 mm
psi (psig)	kPa	1 psi	= 6,894 757 kPa

Für die in diesem Dokument zitierten Internationalen Normen wird im Folgenden auf die entsprechenden Deutschen Normen hingewiesen:

ISO 10438-1 siehe DIN EN ISO 13438-1

ISO 10438 *Petroleum, petrochemical and natural gas industries — Lubrication, shaft-sealing and control-oil systems and auxiliaries* besteht aus den folgenden Teilen:

- *Part 1: General requirements*
- *Part 2: Special-purpose oil systems*
- *Part 3: General-purpose oil systems*
- *Part 4: Self-acting gas seal support systems*

Änderungen

Gegenüber DIN EN ISO 10438-4:2005-07 wurden folgende Änderungen vorgenommen:

- a) der Norm-Inhalt dieses Teils 4 mit Anforderungen an Sperrgasversorgungsanlagen wurde redaktionell neu gegliedert, wobei die Angaben über allgemeine Anforderungen sowie weitere Anforderungen an Leitungen und Rohre sowie an Kontroll- und Messeinrichtungen und elektrische Systeme jeweils in eigenen Abschnitten zusammengefasst wurden.

Gegenüber DIN EN ISO 10438-4:2008-07 wurde folgende Korrektur vorgenommen:

- b) das Datasheet aus dem informativen Anhang A „Datasheets“ wird auf einer extra CD-Rom zur Verfügung gestellt.

Frühere Ausgaben

DIN EN ISO 10438-4: 2005-07, 2008-07

Nationaler Anhang NA (informativ)

Literaturhinweise

DIN EN ISO 10438-1, *Erdöl-, petrochemische und Erdgasindustrie — Schmieröl-, Sperröl- und Regelölversorgungsanlagen und Hilfsanlagen — Teil 1: Allgemeine Anforderungen*

English Version

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Hilfsanlagen —
Teil 4: Sperrgasversorgungsanlagen
(ISO 10438-4:2007)

This European Standard was approved by CEN on 14 December 2007.

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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 CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN ISO 10438-4:2007) 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, petrochemical 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 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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

This document supersedes EN ISO 10438-4:2003.

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

Endorsement notice

The text of ISO 10438-4:2007 has been approved by CEN as a EN ISO 10438-4:2007 without any modification.

Introduction

This International Standard was developed jointly with API 614, 5th edition. ISO 10438 is divided into four parts corresponding to the four chapters of API 614.

Users of this part of ISO 10438 should be aware that further or differing requirements might 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. It is intended that this part of ISO 10438 be used in conjunction with 10438-1.

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

A bullet (•) at the beginning of a clause or subclause 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 the datasheet(s); otherwise it should be stated in the quotation request or in the order.

In this International Standard, US customary (USC) units are included in brackets for information.

1 Scope

This part of ISO 10438 in conjunction with ISO 10438-1 specifies requirements for support systems for self-acting gas seals (dry gas seals), for example as described in ISO 10439 and ISO 10440-1. These systems can serve equipment such as compressors, gears, pumps and drivers.

NOTE For the purposes of this statement of scope, API 617 is equivalent to ISO 10439 and API 619 is equivalent to ISO 10440-1.

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 10438-1:2007, *Petroleum, petrochemical and natural gas industries — Lubrication, shaft-sealing and control-oil systems and auxiliaries — Part 1: General requirements*

ISO 15649, *Petroleum and natural gas industries — Piping*

API RP 520, *Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries — Part I: Sizing and Selection*

API RP 520, *Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries — Part II: Installation*

API 526, *Flanged Steel Pressure Relief Valves*

ANSI/ASME B31.3, *Process Piping*

3 Terms, abbreviated terms and definitions

For the purposes of this document, the terms, abbreviated terms and definitions given in ISO 10438-1 apply.

4 General

4.1 System selection

Datasheets for system specifications are provided in Annex A.

Annex B provides schemas of typical system components and diagrams of typical, complete dry gas seal support systems and modules. These schemas and diagrams illustrate the general philosophy and requirements of this part of ISO 10438 and are included to assist the purchaser in the selection of an appropriate system. The purchaser and the vendor shall mutually agree upon an acceptable system.

Annex C provides an inspector checklist of typical items reviewed by the purchaser.

4.2 Basic design

4.2.1 The equipment (including auxiliaries) covered by this part of ISO 10438 shall be designed and constructed for a minimum service life of 20 years and at least 5 years of uninterrupted operation.

NOTE It is recognized that this is a design criterion.

- **4.2.2** If specified, the purchaser may specify the vendor responsible for each portion of the design, scope of supply, installation and performance of the dry gas seal system. If the purchaser is not the end user, then the end user shall approve the vendors specified.
- **4.2.3** The purchaser shall specify the equipment's normal operating point and all other operating points. Other parameters required for the design of the seal support system, such as gas composition, maximum and minimum flare pressure, maximum and minimum sealing pressure and settle-out pressure shall also be specified.

4.2.4 Unless otherwise specified, the lube-oil console and the dry gas seal module shall be mounted on separate skids.

4.2.5 The dry gas seal system shall be designed to serve the full range of equipment operating conditions specified. These conditions may include but are not limited to the following:

- a) settle-out pressures;
- b) process relief-valve settings;
- c) shop test and field run-ins;
- d) start-up conditions;
- e) gas composition.

NOTE This requires a detailed system review with the equipment suppliers, purchaser and owner, and is normally finalized at the coordination meeting.

4.2.6 Control systems shall provide adequate gas velocity across the labyrinths at all clearances, including minimum labyrinth clearance to twice the maximum design labyrinth clearance to prevent migration of contaminants from the process gas.

NOTE In a flow-control system, velocity across the labyrinths decreases as clearances increase.

4.2.7 All gas streams (including alternate, backup, start-up sources) into the seal shall be provided at a temperature of at least 20 K (35 °R) above their dew point in order to preclude the possibility of liquid entering the dry gas seal.

NOTE 1 On some systems, the discharge temperature of the compressor gas stream might not provide this dew-point margin.

NOTE 2 In some cases, this can require heaters and/or heat tracing by the owner.

The dew-point margin shall be maintained throughout the seal and not just at the supply connections.

In some cases, alternate gases to the process gas should be considered for start-up or dew-point reasons.

- **4.2.8** If specified, additional provision for seal-gas conditioning as specified by the purchaser shall be furnished.

NOTE Gas conditioning can involve heat tracing, alternate seal-gas sources, coalescing filters, or other provisions.

4.2.9 Valved vents, drains and piping shall be furnished to permit draining, cleaning and refilling of idle components, such as filter elements, while the equipment is in operation.

4.2.10 Seal-gas module piping shall be arranged such that it can be manually drained prior to start-up to avoid the possibility of condensed liquids entering the seals.

This is also a requirement for interconnecting piping that shall be followed by the packager or installation contractor.

- **4.2.11** The purchaser shall specify when and where double block and bleed valves are required for isolating a component and how they are arranged.

NOTE Double block valves are normally provided where there are safety or environmental issues associated with the reliability of a single block valve.

- **4.2.12** Filters, drain traps and other pressure vessels shall be in accordance with the specified pressure design code. The purchaser shall specify if it is necessary that the vessels be code stamped.

NOTE 1 Most vessels for the gas seal module are smaller than the size required for the ASME code stamp.

NOTE 2 Code stamping might not be applicable for pressure design codes other than ASME.

NOTE 3 Reference can be made to ISO 10438-1:2007, 4.5.7. Local jurisdictions can require a code stamp.

4.2.13 The module and components shall perform on test and on its permanent foundation within the specified acceptance criteria. After installation, the performance of the module shall be the joint responsibility of the purchaser and the vendor who has unit responsibility.

- **4.2.14** The vendor shall advise the purchaser of, and both parties shall mutually agree upon, any special provisions that are necessary to ensure that an adequate backup supply of seal gas and seal buffer gas or seal separation gas is maintained in the event of complete loss of the main seal-gas supply source. These provisions may include alternate seal-gas supply sources, backup gas bottles and special arrangements for start-up, purge gas and settle-out conditions. Provisions shall be adequate for block-in vent or purge situations as applicable. The purchaser shall specify the required block-in time. The purchaser and the vendor shall mutually agree upon the backup system and its component requirements.

4.2.15 Block valves that interrupt the gas flow to the equipment shall not be installed in gas supply lines downstream of the filters unless the block valves are part of a component block and bypass arrangement.

4.2.16 The support structure shall be stainless steel or carbon steel and painted.

4.2.17 Dry-gas-seal system piping size and vents shall be sized to prevent over-pressurization of the bearing housings in the event of a failure of the seal.