SLOVENSKI STANDARD
SIST EN ISO 17078-2:2008

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Industrija za predelavo nafte in zemeljskega plina - Vrtalna in proizvodna oprema - 2. del: Naprave za regulacijo pretoka za vpenjalne osi s stranskimi žepi (ISO 17078-2:2007)

Petroleum and natural gas industries - Drilling and production equipment - Part 2: Flow-control devices for side-pocket mandrels (ISO 17078-2:2007)

Erdöl- und Erdgasindustrie - Bohr- und Produktionsausrüstungen - Teil 2: Durchfluss-Regelvorrichtungen für Gaslift-Ventile (ISO 17078-2:2007)

Industries du pétrole et du gaz naturel - Équipement de forage et de production - Partie 2: Dispositifs de régulation de la vitesse d'écoulement pour raccords à poche latérale (ISO 17078-2:2007)

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75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

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Petroleum and natural gas industries - Drilling and production equipment - Part 2: Flow-control devices for side-pocket mandrels (ISO 17078-2:2007)

Industries du pétrole et du gaz naturel - Équipement de forage et de production - Partie 2: Dispositifs de régulation de la vitesse d'écoulement pour raccords à poche latérale (ISO 17078-2:2007)

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Foreword

This document (EN ISO 17078-2:2007) 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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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Endorsement notice

The text of ISO 17078-2:2007 has been approved by CEN as a EN ISO 17078-2:2007 without any modification.

INTERNATIONAL STANDARD

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Petroleum and natural gas industries — Drilling and production equipment —

Part 2: Flow-control devices for side-pocket mandrels

Industries du pétrole et du gaz naturel — Équipement de forage et de production —
Partie 2: Dispositifs de régulation de la vitesse d'écoulement pour raccords à poche latérale

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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.

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ISO 17078-2 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 4, *Drilling and production equipment*.

ISO 17078 consists of the following parts, under the general title *Petroleum and natural gas industries — Drilling and production equipment*:

— *Part 1: Side-pocket mandrels*

— *Part 2: Flow-control devices for side-pocket mandrels*

— *Part 3: Running, pulling and kick-over tools, and latches for side-pocket mandrels*

A part 4 dealing with practices for side-pocket mandrels and related equipment is under development.

Introduction

This part of ISO 17078 has been developed by users/purchasers and suppliers/manufacturers of subsurface flow-control devices used in side-pocket mandrels (hereafter called flow-control devices) intended for use in the worldwide petroleum and natural gas industry. This part of ISO 17078 is intended to provide requirements and information to all parties who are involved in the specification, selection, manufacture, testing and use of flow-control devices. Further, this part of ISO 17078 addresses supplier/manufacturer requirements that set the minimum parameters with which suppliers/manufacturers shall comply to claim conformity with this part of ISO 17078.

This part of ISO 17078 has been structured to support varying requirements in environmental service classes, design validation, product functional testing and quality control grades. These variations allow the user/purchaser to select the grade for a specific application.

Well environmental service classes. There are four environmental service classes for flow-control devices that provide the user/purchaser with a range of choices from which to select products to meet varying environmental conditions.

Design validation grades. There are three design validation grades for flow-control devices that provide the user/purchaser with a range of technical and performance requirements. This ensures that the products supplied according to this part of ISO 17078 meet the requirements and that the user/purchaser is able to compare these requirements with its preference or application and determine whether additional requirements are placed on the supplier/manufacturer.

It is important that users of this part of ISO 17078 be aware that requirements in addition to those outlined herein can be needed for individual applications. This part of ISO 17078 is not intended to inhibit a supplier/manufacturer from offering, or the user/purchaser from accepting, alternative equipment or engineering solutions. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, it is the responsibility of the supplier/manufacturer to identify any variations from this part of ISO 17078 and provide details.

Product functional testing grades. There are three product functional testing grades for flow-control devices that provide the user/purchaser with a range of choices for confirming that individual products manufactured under this part of ISO 17078 meet the design specifications.

Quality control grades. There are two quality control grades that provide the user/purchaser with the choice of requirements to meet specific preferences or applications. Additional quality upgrades can be specified by the user/purchaser as supplemental requirements.

In addition to this document, ISO 17078-1 provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. ISO 17078-3, to be published, is intended to provide requirements for running, pulling and kick-over tools, and latches used in conjunction with side-pocket mandrel flow-control devices.

Petroleum and natural gas industries — Drilling and production equipment —

Part 2: Flow-control devices for side-pocket mandrels

1 Scope

This part of ISO 17078 provides requirements for subsurface flow-control devices used in side-pocket mandrels (hereafter called flow-control devices) intended for use in the worldwide petroleum and natural gas industry. This includes requirements for specifying, selecting, designing, manufacturing, quality-control, testing and preparation for shipping of flow-control devices. Additionally, it includes information regarding performance testing and calibration procedures.

The installation and retrieval of flow-control devices is outside the scope of this part of ISO 17078. Additionally, this part of ISO 17078 is not applicable to flow-control devices used in centre-set mandrels or with tubing-retrievable applications.

This part of ISO 17078 does not include requirements for side-pocket mandrels, running, pulling, and kick-over tools, and latches that might or might not be covered in other ISO specifications. Reconditioning of used flow-control devices is outside of the scope of this part of ISO 17078.

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 9000, *Quality management systems — Fundamentals and vocabulary*

ISO 15156 (all parts), *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production*

ISO 17078-1:2004, *Petroleum and natural gas industries — Drilling and production equipment — Part 1: Side-pocket mandrels*

ANSI/NCSL Z540-1, *Calibration Laboratories and Measuring and Test Equipment General Requirements*[1)]

ASME Boiler and Pressure Vessel Code, Section IX, *Welding and Brazing Qualifications*[2)]

ASTM A370, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*[3)]

1) NCSL International, 2995 Wilderness Place, Suite 104, Boulder, Colorado 80301-5404, USA.

2) American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990, USA.

3) ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959.

ASTM D1415, *Standard Test Method for Rubber Property — International Hardness*

ASTM D2240, *Standard Test Method for Rubber Property — Durometer Hardness*

BS 2M 54, *Specification for temperature control in the heat treatment of metals*[4)]

MIL-STD-1916, *DOD Preferred Methods for Acceptance of Product*[5)]

MIL-STD-413C, *Visual Inspection Guide for Elastomeric O-rings*[5)]

SAE AMS-H-6875, *Heat Treatment of Steel Raw Materials*[6)]

SAE AS568B, *Aerospace Size Standard for O-Rings*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 (for quality-system-related terms not given below) and the following apply.

3.1
acceptance
flow-control device component(s) and/or assembly(s) accepted for use without restriction

3.2
ager
pressure device used to apply an external pressure to a flow-control device for a specified period of time and/or number of cycles

3.3
balanced injection-pressure-operated
injected gas pressure-operated flow-control device with no spread, that is, for which the opening and closing pressures are the same

3.4
certificate of conformance
documentation declaring that a specific flow-control device meets the requirements of this part of ISO 17078 and the requirements of the functional specification

3.5
coating
application of a thin film of one material on the surface of another material for different purposes

3.6
date of manufacture
date of manufacturer's final acceptance of finished products

NOTE The date is day-month-year in the format DD-MM-YYYY.

3.7
design family
group of products whose configurations, sizes, materials and applications are sufficiently similar that identical design methodologies can be used to establish the design parameters for each product within the family

4) British Standards Institute, Customer Services, 389 Chiswick High Road, London W4 4AL, UK.

5) US military/Department of Defense standard.

6) SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA.

3.8
design method
method, procedure or equations used by the supplier/manufacturer to design a flow-control device product

3.9
design validation
process of proving a design by testing to demonstrate conformity of the product to design requirements

3.10
design verification
process of examining the premise of a given design by calculation, comparison or investigation to substantiate conformity with specified requirements

3.11
differential flow-control device
flow-control device that opens and closes on differential pressure between the injected gas and production pressures

3.12
dome
chamber that contains an internal pressure that is applied to the responsive element that may be a bellows or piston

3.13
dome charge maximum
supplier/manufacturer's maximum recommended pressure charge in the dome at recommended operating temperature

3.14
dummy flow-control device
blank device that is installed in a side-pocket mandrel to prevent flow or pressure communication between the casing annulus and the tubing

3.15
dump/kill flow-control device
flow-control device that is initially closed; once it is open, it cannot be closed again

NOTE These valves have very large ports and no reverse-flow check to allow a high injection rate to kill the well.

3.16
dynamic flow testing
flow testing of an operable flow-control device to determine the flow characteristics as a function of changes in either upstream or downstream pressures

3.17
end connections
thread or other mechanism providing a connection between the flow-control device and other equipment

3.18
flow coefficient testing
testing that is performed on a modified flow-control device to determine the flow capacity as a function of fixed stem travel

3.19
full life cycle
expected period of time over which the product shall function according to the manufacturer's specifications

3.20
functional test
test performed to confirm proper operation of equipment