SLOVENSKI STANDARD
SIST EN ISO 17078-1:2005

01-april-2005

Industrija za predelavo nafte in zemeljskega plina - Vrtalna in proizvodna oprema - 1. del: Vpenjalna os s stranskimi žepi (ISO 17078-1:2004)

Petroleum and natural gas industries - Drilling and production equipment - Part 1: Side-pocket mandrels (ISO 17078-1:2004)

Erdöl- und Erdgasindustrie - Bohr-und Fördereinrichtungen - Teil 1: Seitentaschen-Rohre (ISO 17078-1:2004

Industries du pétrole et du gaz naturel - Equipement de forage et de production - Partie 1: Raccords a poche latérale (ISO 17078:2004)

Ta slovenski standard je istoveten z: **EN ISO 17078-1:2004**

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

SIST EN ISO 17078-1:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 17078-1

December 2004

ICS 75.180.10

English version

Petroleum and natural gas industries - Drilling and production equipment - Part 1: Side-pocket mandrels (ISO 17078-1:2004)

Industries du pétrole et du gaz naturel - Equipement de forage et de production - Partie 1: Raccords à poche latérale (ISO 17078:2004)

This European Standard was approved by CEN on 17 November 2004.

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Ref. No. EN ISO 17078-1:2004: E

Foreword

This document (EN ISO 17078-1:2004) 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of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

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Endorsement notice

The text of ISO 17078-1:2004 has been approved by CEN as EN ISO 17078-1:2004 without any modifications.

INTERNATIONAL STANDARD

ISO 17078-1

First edition
2004-12-15

Petroleum and natural gas industries — Drilling and production equipment —

Part 1: Side-pocket mandrels

Industries du pétrole et du gaz naturel — Équipement de forage et de production —

Partie 1: Raccords à poche latérale

Reference number
ISO 17078-1:2004(E)

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Published in Switzerland

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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 17078-1 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*

The following parts are under preparation:

— *Part 2: Side-pocket mandrel gas lift valve and flow control devices*

— *Part 3: Latches, seals, and interface data for side-pocket mandrels and flow control devices*

Introduction

This part of ISO 17078 has been developed by users/purchasers and suppliers/manufacturers of side-pocket mandrel products 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 side-pocket mandrel products. Further, this part of ISO 17078 addresses supplier/manufacturer requirements that set the minimum parameters with which each supplier/manufacturer shall comply, in order to be able to claim conformity with this part of ISO 17078.

This has been structured to allow different quality control grades to support quality control, design-validation, design-verification, and product-functional testing. These variations allow the user/purchaser to select the grades that are required for a specific application. If the user/purchaser does not specify a specific grade for the following categories, the supplier/manufacturer will meet the requirements of grade 3.

Well environmental service classes. There are four environmental service classes for side-pocket mandrel products that provide the user/purchaser with a range of choices to select products to meet varying environmental conditions.

Design-validation grades. There are three design validation grades for side-pocket mandrel products that provide the user/purchaser with a range of technical and performance requirements. Users of this part of ISO 17078 should be aware that requirements in addition to those outlined herein might 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. Where an alternative is offered, the supplier/manufacturer should identify any variations from this part of ISO 17078 and provide details.

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

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

Annexes A, B, C and D of this part of ISO 17078 are normative requirements; Annexes E and F are informative.

Petroleum and natural gas industries — Drilling and production equipment —

Part 1: Side-pocket mandrels

1 Scope

This part of ISO 17078 provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. This part of ISO 17078 includes specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of side-pocket mandrels.

This part of ISO 17078 does not address nor include requirements for end connections between the side-pocket mandrels and the well conduit. The installation and retrieval of side-pocket mandrels is outside the scope of this part of ISO 17078. Additionally, this part of ISO 17078 does not include specifications for centre-set mandrels, or mandrels that employ or support tubing-retrievable flow control devices.

This part of ISO 17078 does not include gas-lift or any other flow-control valves or devices, latches, and/or associated wire line equipment that can or cannot be covered in other ISO specifications.

The side-pocket mandrels to which this part of ISO 17078 refers are independent devices that can accept installation of flow-control or other devices down-hole.

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 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (Scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO 9000:2000, *Quality management systems — Fundamentals and vocabulary*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 11960:2001, *Petroleum and natural gas industries — Steel pipes for use as casing or tubing for wells*

ISO 15156-1, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 1: General principles for selection of cracking-resistant materials*

ISO 15156-2, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons*

ISO 15156-3, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys*

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

ASME Boiler and Pressure Vessel Code, Section V, *Nondestructive Examination*[2)]

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

ASME Boiler and Pressure Vessel Code, Section IX, *Welding and Brazing Qualifications*

ASTM E94, *Standard Guide for Radiographic Examination*[3)]

ASTM E140, *Standard Hardness Conversion Tables for Metals*

ASTM E165, *Standard Test Method for Liquid Penetrant Examination*

ASTM E709, *Standard Guide for Magnetic Particle Examination*

BS 2M 54:1991, *Specification for temperature control in the heat treatment of metals*[4)]

SAE AMS-H-6875:1998, *Heat Treatment of Steel Raw Materials*[5)]

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 9000:2000 and the following apply.

3.1
acceptance
agreement/acknowledgement that side-pocket mandrel component(s) and/or assembly(ies) can be used without restriction

3.2
certificate of conformance
documentation declaring that a specific side-pocket mandrel meets the requirements of this part of ISO 17078 and the requirements of the functional specification

3.3
coating
internal and/or external application of a material to a side-pocket mandrel for corrosion protection, paraffin control, etc.

3.4
compressive load
force creating compression that may be applied to a side-pocket mandrel

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1) NCSL International, 2995 Wilderness Place, Suite 107, 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, West Conshohocken, PA 19428-2959, USA.

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

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

3.5
date of manufacture
date of manufacturer's final acceptance of finished products

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

3.6
deflector
internal device that guards landed side-pocket devices or discriminates the landing of side-pocket devices into the side-pocket mandrel pocket (receptacle for mandrel devices), but deflects non-side-pocket devices, thus allowing the latter to pass through the side-pocket mandrel, when being deployed down hole

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

3.8
design method
method, procedure or equations used by the supplier/manufacturer to design a side-pocket mandrel product

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

[ISO/TS 29001:2003]

NOTE See also 5.7.

3.10
design verification
process of examining the result of a given design or development activity to determine conformity with specified requirements

[ISO/TS 29001:2003]

3.11
dogleg
change in well bore inclination

NOTE The "severity" of the dogleg is proportional to the change in inclination, typically measured in degrees.

3.12
drift outside diameter
tube's ID through which all elements of the assembled side-pocket mandrel can pass

3.13
end connection
thread(s) on the side-pocket mandrel end(s) used to attach the side-pocket mandrel to the tubing string

3.14
environmental service class
category of environmental conditions for which the side-pocket mandrel product is designed to be used

NOTE See also 5.6.

3.15
external drifting
test to observe the unencumbered or unrestricted passage of a side-pocket mandrel having a specific diameter through a drift test tool of specified inside diameter and length

3.16
external test pressure
differential pressure between the applied external pressure and internal pressure at which a side-pocket mandrel is tested for collapse resistance

3.17
full life cycle
expected period of time in which the product shall function according to manufacturer's specifications

3.18
functionality
capability of a side-pocket mandrel to conform to defined properties, characteristics and limits

3.19
gas passage undercut
clearance between the flow-control device and the pocket of the side-pocket mandrel through which injected media flow

3.20
heat
material originating from a final melt or cast lot

NOTE For re-melted alloys, the heat is the raw material originating from a single re-melted ingot.

3.21
internal drifting
test to observe the unencumbered or unrestricted passage of a drift bar having a specific diameter and length through a side-pocket mandrel to determine its full-bore capability

3.22
internal test pressure
differential pressure between the applied internal pressure and external pressure at which a side-pocket mandrel is tested for burst resistance

3.23
job lot
group or quantity of piece parts, sub-assemblies or assemblies that are grouped or processed together during the manufacturing process

3.24
latch
retention mechanism for a flow-control device that is landed in the side-pocket mandrel

3.25
latch profile
feature such as a lug or recess that is suitable for the reception of the locking mechanism within a side-pocket mandrel

3.26
linear indication
material inconsistency whose length is equal to or greater than three times the width of the material inconsistency

3.27
linear mass
mass per length of tubular product

3.28
manufacturing
process(es) and action(s) performed by an equipment supplier/manufacturer that are necessary to provide finished component(s), assemblies, and related documentation that fulfil the requests of the user/purchaser and that meet the standards of the supplier/manufacturer

NOTE Manufacturing begins when the supplier/manufacturer receives the order and is completed at the moment the component(s), assembly(ies), and related documentation are transferred to a transportation provider.

3.29
model
side-pocket mandrels with unique components and functional characteristics that differentiate it from other side-pocket mandrels of the same type

NOTE Side-pocket mandrels can have a variety of end connections.

3.30
operating environment
set of environmental conditions to which the product is exposed during its service life

NOTE Environmental conditions can include temperature, pressure, liquid composition and properties, gas composition and properties, solids, etc.

3.31
operational parameter
requirement and/or restriction that the product is exposed to during its service life

EXAMPLES Operating environment, through-tubing drift, landing and retrieval of flow-control devices, passage of various tools through the side-pocket mandrel, injection of various well treatment chemicals/fluids, etc.

3.32
orienting profile
design feature (e.g. orienting sleeve) of a side-pocket mandrel that acts together with certain wireline tools to aid in radial and vertical alignment of tools used to install and remove side-pocket landed equipment

3.33
perceptible leak
any leak during a hydro test that can be observed

3.34
pocket
parallel bore, including sealing surfaces and latching profiles, that is offset from and essentially parallel with the through-bore of the side-pocket mandrel

3.35
product functional-testing grade
category based on a defined range of processes, method(s) and/or test(s) that are used by the supplier/manufacturer to demonstrate that a particular side-pocket mandrel has been manufactured to fully meet the functional and manufacturing requirements for that product

3.36
quality-control grade
category based on a defined range of processes and/or method(s) that are used by the supplier/manufacturer to assure the quality of the materials and manufacturing process(es) used to produce a particular side-pocket mandrel

3.37
rated pressure
maximum differential pressure, at the rated temperature, to which the side-pocket mandrel is designed to be subjected in normal operation