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SIST EN ISO 15136-1:2002

01-januar-2002

Downhole equipment for petroleum and natural gas industries - Progressing cavity pump systems for artificial lift - Part 1: Pumps (ISO 15136-1:2001)

Petroleum and natural gas industries - Pipeline transportation systems - Welding of pipelines (ISO 13847:2000 modified)

Erdöl- und Erdgasindustrien - Rohrleitungstransportsysteme -Schweißen von Rohrleitungen (ISO 13847:2000 modifiziert)

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Industries du pétrole et du gaz naturel - Conduites pour systemes de transport - Soudage des conduites (ISO 13847:2000 modifiée)

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Ta slovenski standard je istoveten z: **EN ISO 15136-1:2001**

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment

SIST EN ISO 15136-1:2002 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 15136-1

July 2001

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English version

Downhole equipment for petroleum and natural gas industries - Progressing cavity pump systems for artificial lift - Part 1: Pumps (ISO 15136-1:2001)

Equipement de fond de trou pour les industries du pétrole et du gaz naturel - Pompes de fond à cavité progressive pour activation des puits - Partie 1: Pompes (ISO 15136-1:2001)

Bohrloch-Ausrüstung für die Erdöl- und Erdgasindustrie - Exenterschneckentiefpump-Fördersysteme - Teil 1: Pumpen (ISO 15136-1:2001)

This European Standard was approved by CEN on 15 July 2001.

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Foreword

This document (ISO 15136-1:2001) 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of an identical text or by endorsement, at the latest by June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Endorsement notice

The text of the International Standard ISO 15136-1:2001 has been approved by CEN as a European Standard without any modifications.

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INTERNATIONAL STANDARD

ISO 15136-1

First edition
2001-07-15

Downhole equipment for petroleum and natural gas industries — Progressing cavity pump systems for artificial lift —

Part 1: Pumps

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Équipement de fond de trou pour les industries du pétrole et du gaz naturel — Pompes de fond à cavité progressive pour activation des puits —

Partie 1: Pompes

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 15136 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15136-1 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC4, *Drilling and production equipment*.

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ISO 15136 consists of the following parts, under the general title *Downhole equipment for petroleum and natural gas industries — Progressing cavity pump systems for artificial lift*:

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— *Part 1: Pumps*

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— *Part 2: Drive heads*

Annexes A and B form a normative part of this part of ISO 15136. Annexes C, D, E and F are for information only.

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Introduction

This part of ISO 15136 has been developed by users/purchasers and suppliers/manufacturers of progressing cavity pumps (PCP) for artificial lift use in the petroleum and natural gas industries worldwide. This part of ISO 15136 is intended to give requirements and information to both parties in the selection, manufacture, testing and use of progressing cavity pumps. Further, this part of ISO 15136 addresses supplier/manufacturer requirements, which set the minimum parameters with which suppliers/manufacturers must comply to claim conformity with this part of ISO 15136.

A progressing cavity pump comprises two helical gears, one rotating inside the other. The stator and rotor axes are parallel and spaced between each other. The external helical gear (stator) has one more thread (or tooth) than the internal helical gear (rotor). Whatever the number of threads of the two elements, they must always differ by one. The fluid moves from suction to discharge. The discharge and the suction are always isolated from each other by a constant length seal line. Definitions of the accessories, engineering methodology and description of the PCP system, including illustrations, are provided in annexes D, E and F respectively.

Users of this part of ISO 15136 should be aware that further or differing requirements might be needed for individual applications. This part of ISO 15136 is not intended to inhibit a supplier/manufacturer from offering, or the user/purchaser from accepting, alternative equipment or engineering solutions. This may be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the supplier/manufacturer should identify any variations from this part of ISO 15136 and provide details.

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Downhole equipment for petroleum and natural gas industries — Progressing cavity pump systems for artificial lift —

Part 1: Pumps

1 Scope

This part of ISO 15136 provides guidelines and requirements for subsurface progressing cavity pumps (PCP) used in the petroleum and natural gas industries for the production of single and multiphase fluids, based on the principle defined in [2].

This part of ISO 15136 is applicable to the subsurface progressing cavity pump. It refers to, but is not applicable to, intermediate components and accessories that are necessary to make a complete pumping unit. It does not include requirements for shipping, loading and transportation.

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2 Terms and definitions

For the purposes of this part of ISO 15136, the following terms and definitions apply (for illustration, see annexes D, E and F).

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2.1
cavity
lenticular, spiral, separate volume created between the pump stator and rotor when they are assembled

2.2
displacement
volume of fluid pumped in one revolution of the rotor in the stator

2.3
drive string
device transmitting power (usually sucker rods) between the drivehead and the PCP

2.4
dynamic level
fluid level under standard conditions of temperature and pressure when the PCP is in operation

NOTE Standard conditions, unless otherwise indicated, are 15 °C and 0,101 3 MPa.

2.5
flowrate
volume of fluid pumped per time unit

2.6
head rating
maximum allowable differential pressure of the PCP

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2.7
helix
continuous spiral with a constant pitch

2.8
insert pump
pump whose stator is inserted into the tubing using the drive string

2.9
interference
radial fit between the pump rotor and stator

2.10
pitch length
distance between two crests belonging to the same seal line

NOTE The rotor and stator have different pitch lengths, p_r and p_s respectively (see Figures E.1, E.2 and F.1).

2.11
PCP
progressing cavity pump
pump consisting of a stator and a rotor whose geometry of assembly is such that it creates two or more series of lenticular, spiral, separate cavities

2.12
rotor
pump shaft, whose external surface is in the form of a single or multiple helix, provided with a connection to attach to the drive string

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2.13
rotor stop
device which determines the rotor position during PCP installation

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See Figure D.1.

2.14
seal line
helix formed by the line of contact between rotor and stator

2.15
slippage
fluid leakage occurring across the dynamic seal lines between the cavities

2.16
static level
stabilized fluid level under standard conditions of temperature and pressure when the PCP is at a stopped position

NOTE Standard conditions, unless otherwise indicated, are 15 °C and 0,101 3 MPa.

2.17
stator
housing and a lining (typically elastomeric) in the form of a double or multiple internal helix, which always has one more helix than the rotor, with a connection to the production tubing

2.18
submergence
difference between the dynamic level and the PCP setting depth

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2.19
tubing-conveyed pump
pump whose stator is connected to the bottom of the tubing

3 Symbols

d_r rotor minor diameter, i.e. the diameter of the circle tangent to the inner rotor lobes

D_r rotor major diameter, i.e. the diameter of the circle tangent to the outer rotor lobes

d_s stator minor diameter, i.e. the diameter of the circle tangent to the inner stator lobes

D_s stator major diameter, i.e. the diameter of the circle tangent to the outer stator lobes

P_r rotor pitch length

P_s stator pitch length

n_r number of rotor lobes

N pump revolutions per minute

For illustration, see Figures E.1, E.2 and E.3.

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4 Functional specification

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4.1 General

The user/purchaser shall prepare a functional specification to order products which conform with this part of ISO 15136 in which the requirements and operating conditions listed in 4.2 to 4.6, as appropriate, and/or the supplier's/manufacturer's specific product (see example of data form in annex C) shall be specified.

These requirements and operating conditions may be conveyed by means of a dimensional drawing, data sheet or other suitable documentation.

4.2 PCP type

— Tubing-conveyed;

— insert PCP.

4.3 Well parameters

— Sizes, grades, mass, thread of casing, liner, tubing;

— depth (true vertical and measured);

— perforation intervals (true vertical and measured);

— deviation survey;

— packer, anchor data, landing nipple or other restriction if any.

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