SLOVENSKI STANDARD
SIST EN ISO 10441:2000

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Petroleum and natural gas industries - Flexible couplings for mechanical power transmission - Special purpose applications (ISO 10441:1999)

Petroleum and natural gas industries - Flexible couplings for mechanical power transmission - Special purpose applications (ISO 10441:1999)

Erdöl- und Erdgasindustrie - Nachgiebige Kupplungen zur mechanischen Kraftübertragung - Besondere Anwendungsfälle (ISO 10441:1999)

Industries du pétrole et du gaz naturel - Accouplements flexibles pour transmission de puissance mécanique - Applications spéciales (ISO 10441:1999)

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21.120.20	Sklopke	Couplings
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EUROPEAN STANDARD

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English version

Petroleum and natural gas industries - Flexible couplings for mechanical power transmission - Special purpose applications (ISO 10441:1999)

Industries du pétrole et du gaz naturel - Accouplements flexibles pour transmission de puissance mécanique - Applications spéciales (ISO 10441:1999)

This European Standard was approved by CEN on 15 March 1999.

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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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of the International Standard ISO 10441:1999 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 September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

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.

NOTE FROM CEN/CS: 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.

Endorsement notice

The text of the International Standard ISO 10441:1999 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 10441

First edition
1999-03-15

Petroleum and natural gas industries — Flexible couplings for mechanical power transmission — Special purpose applications

Industries du pétrole et du gaz naturel — Accouplements flexibles pour transmission de puissance mécanique — Applications spéciales

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Contents

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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 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.

International Standard ISO 10441 was prepared by Technical Committee TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems.*

Annexes A, B and C of this International Standard are for information only.

Introduction

This International Standard is based on the accumulated knowledge and experience of manufacturers and users of power transmission couplings used to couple large or critical machines in the petroleum and natural gas industries, but its use is not restricted to these industries.

This International Standard has been derived from the American Petroleum Institute, standard 671 but contains significant differences from that standard.

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

This International Standard requires the purchaser to specify certain details and features.

A bullet (•) at the beginning of a clause, subclause or paragraph 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 data sheets; otherwise it should be stated in the quotation request (enquiry) or in the order.

Petroleum and natural gas industries — Flexible couplings for mechanical power transmission — Special purpose applications

1 Scope

1.1 This International Standard specifies the requirements for couplings for the transmission of power between the rotating shafts of two machines for service in special purpose applications in the petroleum and natural gas industries. Such applications will typically be in large and/or high speed machines in services that may be required to operate continuously for extended periods, are often unspared and are critical to the continued operation of the installation. By agreement, it may be used to apply to other services.

NOTE Couplings for general purpose, less critical applications are covered in ISO 14691.

1.2 Couplings covered by this International Standard are designed to accommodate parallel (or lateral) offset, angular misalignment and axial displacement of the shafts without imposing unacceptable mechanical loading on the coupled machines. It is applicable to gear, metallic flexible-element, quillshaft and torsionally resilient-type couplings. It is not applicable to other types, such as clutch, hydraulic, eddy-current, rigid, radial spline, chain and bellows types.

1.3 This International Standard is applicable to the design, materials of construction, manufacturing quality, inspection and testing of couplings. It does not include criteria for the selection of coupling types for specific applications.

NOTE It is strongly recommended that, when users fit new couplings to existing equipment, which are different from those originally fitted, they consult the vendor who originally had unit responsibilty for the equipment train, to ensure proper application of this International Standard. It will generally be necessary to recalculate the rotor dynamics of the train.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1940-1:1986, *Mechanical vibration — Balance quality requirements of rigid rotors — Part. 1: Determination of permissible residual unbalance.*

ISO 8821, *Mechanical vibration — Balancing — Shaft and fitment key convention.*

ISO 14691, *Petroleum and natural gas industries — Flexible couplings for mechanical power transmission — General purpose applications.*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1 Terms relating to coupling types

3.1.1
mechanical contact coupling
coupling designed to transmit torque by direct mechanical contact between mating parts and accommodate misalignment and axial displacement by relative rocking and sliding motion between the parts in contact

NOTE The contacting parts may be metallic or may be made of self-lubricating nonmetallic material.

3.1.1.1
gear coupling
type of mechanical contact coupling designed to transmit torque and accommodate misalignment and axial displacement by relative rocking and sliding motion between mating internal and external profiled gears

3.1.2
metallic flexible-element coupling
coupling that obtains its flexibility from the flexing of thin metallic discs, diaphragms or links

3.1.2.1
metallic diaphragm coupling
type of metallic flexible-element coupling consisting of one or more metallic flexible elements in the form of thin circular plates that are attached to one part of the coupling at their outer diameter and the other part at their inner diameter

3.1.2.2
metallic disc coupling
type of metallic flexible-element coupling consisting of one or more metallic flexible elements that are alternately attached to the two parts of the coupling, the attachment points being essentially equidistant from the centreline

3.1.3
elastomeric flexible-element coupling
coupling in which the torque is transmitted through one or several elastomeric elements

3.1.3.1
elastomeric shear coupling
type of elastomeric flexible-element coupling in which the torque is transmitted through an elastomeric element which is principally loaded in shear

NOTE 1 The element may be in the form of a tyre, a bellows (with one or more convolutions) or a diaphragm.

NOTE 2 A single such elastomeric element is usually able to accommodate angular misalignment, parallel offset and axial displacement.

3.1.3.2
elastomeric compression coupling
type of elastomeric flexible-element coupling in which elastomeric inserts are located between adjacent parts of the driving and driven halves of the coupling and are principally loaded in compression

NOTE 1 The inserts are often in the form of bushes or wedges, or one single insert.

NOTE 2 The ability of such couplings to accommodate misalignment, particularly of the parallel (or lateral) offset type, is limited.

3.1.4
double-engagement coupling
coupling with two planes of flexure

NOTE This arrangement enables couplings of certain types, notably gear and metallic flexible-element types, which cannot normally accommodate parallel (or lateral) offset, to do so.

3.1.5
quill-shaft coupling
coupling designed to accommodate angular misalignment, parallel (or lateral) offset and torsional fluctuations by elastic deformation of a relatively long slender shaft

NOTE Quill-shaft couplings cannot normally accommodate axial displacement.

3.1.6
single-engagement coupling
coupling with only one plane of flexure

NOTE Single-engagement couplings of some types, notably gear and metallic flexible-element types, will not normally accommodate parallel (or lateral) offset.

3.1.7
torsionally resilient coupling
flexible coupling incorporating increased torsional flexibility and/or torsional damping

NOTE A torsionally resilient coupling may or may not also be designed to accommodate misalignment and/or axial displacement.

3.2 Terms relating to coupling rating

3.2.1
coupling continuous rated torque
T_c
the coupling manufacturer's declared maximum torque which the coupling will transmit continuously, for unlimited periods

NOTE 1 The coupling continuous rated torque is expressed as either:

— a single value at the coupling rated speed, when simultaneously subjected to the coupling rated maximum continuous angular misalignment (at each plane of flexure) and the coupling rated maximum continuous axial displacement,

— or a range of values expressed as an interrelated function of speed, misalignment and axial displacement.

NOTE 2 For certain types of coupling, particularly those with elastomeric elements or inserts, the coupling continuous rated torque may also be a function of the operating temperature.

3.2.2
coupling rated maximum continuous angular misalignment
maximum angular misalignment, at each plane of flexure, which the coupling is able to tolerate continuously for unlimited periods

NOTE It is expressed as either:

— a single value when transmitting the coupling continuous rated torque at the coupling rated speed, and simultaneously subjected to the coupling rated maximum continuous axial displacement

— or a range of values expressed as an interrelated function of speed, torque and axial displacement.

3.2.3
coupling rated maximum continuous axial displacement
maximum axial displacement the coupling is able to tolerate continuously for unlimited periods

NOTE It is expressed as either:

— a single value when transmitting the coupling continuous rated torque at the coupling rated speed, and simultaneously subjected to the coupling rated maximum continuous angular misalignment

— or a range of values expressed as an interrelated function of speed, torque and angular misalignment.