

**SLOVENSKI STANDARD**  
**oSIST prEN ISO 23936-2:2010**  
**01-julij-2010**

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**Petrokemična industrija ter industrija za predelavo nafte in zemeljskega plina -  
Nekovinski materiali v stiku z mediji v povezavi s proizvodnjo nafte in plina - 2. del:  
Elastomeri (ISO/DIS 23936-2:2010)**

Petroleum, petrochemical and natural gas industries - Non-metallic materials in contact  
with media related to oil and gas production - Part 2: Elastomers (ISO/DIS 23936-  
2:2010)

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Industries du pétrole, de la pétrochimie et du gaz naturel - Matériaux non métalliques en  
contact avec les fluides relatifs à la production de pétrole et de gaz - Partie 2:  
Élastomères (ISO/DIS 23936-2:2010)

**Ta slovenski standard je istoveten z: prEN ISO 23936-2**

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**ICS:**

75.180.01	Oprema za industrijo nafte in zemeljskega plina na splošno	Equipment for petroleum and natural gas industries in general
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**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN ISO 23936-2**

May 2010

ICS 75.180.01

English Version

**Petroleum, petrochemical and natural gas industries - Non-metallic materials in contact with media related to oil and gas production - Part 2: Elastomers (ISO/DIS 23936-2:2010)**

Industries du pétrole, de la pétrochimie et du gaz naturel -  
Matériaux non métalliques en contact avec les fluides  
relatifs à la production de pétrole et de gaz - Partie 2:  
Élastomères (ISO/DIS 23936-2:2010)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 12.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (prEN ISO 23936-2:2010) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical 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 document is currently submitted to the parallel Enquiry.

### Endorsement notice

The text of ISO/DIS 23936-2:2010 has been approved by CEN as a prEN ISO 23936-2:2010 without any modification.

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## DRAFT INTERNATIONAL STANDARD ISO/DIS 23936-2

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

# Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production —

## Part 2: Elastomers

*Industries du pétrole, de la pétrochimie et du gaz naturel — Matériaux non métalliques en contact avec les fluides relatifs à la production de pétrole et de gaz —*

*Partie 2: Élastomères*

ICS 75.180.01

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### ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

**In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.**

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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 23936-2 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

ISO 23936 consists of the following parts, under the general title *Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production*:

- Part 1: *Thermoplastics* [SIST EN ISO 23936-2:2012](https://standards.iteh.ai/catalog/standards/sist/f27c059b-ed37-4552-a298-9f802c801f64/sist-en-iso-23936-2-2012)
- Part 2: *Elastomers* <https://standards.iteh.ai/catalog/standards/sist/f27c059b-ed37-4552-a298-9f802c801f64/sist-en-iso-23936-2-2012>
- Part 3: *Thermosets* <sup>1)</sup>
- Part 4: *Fibre reinforced composites* <sup>1)</sup>
- Part 5: *Other non-metallic materials* <sup>1)</sup>

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1) To be prepared later

## Introduction

The ISO 23936 series will be of benefit to a broad industry group ranging from operators, suppliers, engineering companies and authorities. The ISO 23936 series will cover relevant generic types of non-metallic material (thermoplastics, elastomers, thermosetting plastics, fibre reinforced plastics, other) and will include the wide range of existing technical experience. This is important because this has not been summarised before in a technical standard. Polymeric coatings that are applied to the outside of components such as thermal insulation, paint, that are not in contact with oilfield fluids are excluded from the scope of the ISO 23936 series.

The intent of this international standard and the qualification process described herein is to assure that the non-metallic material user has sufficient understanding and knowledge with the applicable materials to provide them with acceptable performance in the specified environment. Further, that the user is supplied with stable quality to meet given specifications. A quality system should be applied to ensure compliance with the requirements of Part 2 of ISO 23936.

The aim is that a successful qualification of a manufacturer and a specific material shall be valid for other projects and different operators. The consideration of qualification of a manufacturer is at the discretion and determination of the purchaser, normally on the basis of documentation provided by the manufacturer as required in this standard or any specific additional documentation. A qualification by one purchaser may also be accepted by subsequent purchasers, provided the requirements in this standard are still complied with.

The purchaser is responsible for ensuring, if necessary, with external competence that the manufacturers selected are qualified.

This Part 2 of ISO 23936 is based on the NORSOK Standard M7 10.

# Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production —

## Part 2: Elastomers

### 1 Scope

The ISO 23936 series describes general principles and gives requirements and recommendations for the selection and qualification of non-metallic materials for service in equipment used in oil and gas production environments, where the failure of such equipment could pose a risk to the health and safety of the public and personnel or to the environment. It can be applied to help to avoid costly corrosion failures of the equipment itself. It supplements, but does not replace, the material requirements given in the appropriate design codes, standards or regulations.

This Part 2 of ISO 23936 describes the requirements and procedures for qualification of elastomeric material used in equipment for oil and gas production.

### 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 34-1:2005, *Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces*

ISO 36:2005, *Rubber, vulcanized or thermoplastic — Determination of adhesion to textile fabrics*

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 815-1, *Rubber, vulcanised or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 1432, *Rubber, vulcanized or thermoplastic — Determination of low temperature stiffening (Gehman test)*

ISO 1432 Technical Corrigendum, *Rubber, vulcanized or thermoplastic — Determination of low temperature stiffening (Gehman test); Technical Corrigendum 1*

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids*

ISO 2781, *Rubber, vulcanized or thermoplastic — Determination of density*

ISO 2921, *Rubber vulcanized — Determination of low-temperature characteristics — Temperature-retraction procedure (TR test).*

ISO 3601-1, *Fluid power systems — O-rings — Part 1: Inside diameters, cross-sections, tolerances and designation codes*

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ISO 3601-3:2005, *Fluid power systems — O-rings — Part 3: Quality acceptance criteria*

ISO 7619-1, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 10423:2009, *Petroleum and natural gas industries — Drilling and production equipment — Wellhead and christmas tree equipment*

ISO 13628-10:2005, *Petroleum and natural gas industries — Design and operation of subsea production systems — Part 10: Specification for bonded flexible pipe*

ISO 13533, *Petroleum and natural gas industries — Drilling and production equipment — Drill-through equipment*

ISO 14310, *Petroleum and natural gas industries — Downhole equipment — Packers and bridge plugs*

ISO 16070, *Petroleum and natural gas industries — Downhole equipment — Lock mandrels and landing nipples*

AS 568B, *Standard Inch Sizes of O-rings*

ASTM D297, *Standard Test Methods for Rubber Products — Chemical Analysis*

ASTM D395, *Standard Test Methods for Rubber Property — Compression Set*

ASTM D1141, *Standard Practice for the Preparation of Substitute Ocean Water*

ASTM D1414, *Standard Test Methods of Testing Rubber O-rings*

ASTM D1415, *Standard Test Method for Rubber property — International hardness*

ASTM D1418-06, *Standard Practice for Rubber and Rubber Latexes-Nomenclature*

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

ASTM D3032, *Standard test methods for hookup wire insulation*

API 14A, *Petroleum and natural gas industries — Downhole equipment — Subsurface safety valve equipment*

API 17K, *Specification for Bonded Flexible Pipe*

GMPHOM:2005, *Guide to Manufacturing and Purchasing Hoses for Offshore Moorings*

### **3 Terms, definitions and abbreviated terms**

For the purposes of this document, the following terms, definitions and abbreviated terms apply.

#### **3.1 Terms and definitions**

##### **3.1.1**

##### **accelerated test**

a test undertaken at conditions designed to speed material deterioration; this is usually accomplished by increasing temperature, to raise chemical reaction rates, but fluid concentration and stress are variables which can also be manipulated

**3.1.2****asset operator**

Person(s) operating asset (well, production train, plant, etc) with knowledge of well parameters - fluid exposure, temperatures, pressures, duration, etc - who shall inform user of same

**3.1.3****compression Set, %**

$100 \times [(\text{Original sample height} - \text{Post-test height}) / \text{Interference}]$

**3.1.4****elastomer**

an amorphous material mechanically mixed with other constituents to form a rubber compound which is then shaped by flow into articles by the manufacturing processes of moulding or extrusion and (invariably) chemically cured at elevated temperature to form an elastic insoluble material. Alternative name, rubber.

**3.1.5****fluid (or medium)**

a medium such as a gas, liquid, supercritical gas, or a mixture of these

**3.1.6****interference**

(Original sample height – height of spacer bar), each measured in same direction as direction of compression

**3.1.8****(compound) manufacturer**

Producer of the elastomer material or semi-finished products made from elastomer materials

**3.1.9****polymer**

a high molecular weight molecule, natural or synthetic, whose chemical structure can be represented by repeated small units which collectively form molecular chains. This material class has three main sub-groups: elastomers, thermoplastics and thermosets

**3.1.10****rapid gas decompression (RGD) or explosive decompression (ED)**

Rapid Gas Decompression (or De-pressurization). Alternative name; Explosive Decompression. Rapid pressure-drop in a high pressure gas-containing system disrupts the equilibrium between external gas pressure and the concentration of gas dissolved inside any polymer. Excess gas seeks to come out of solution at points throughout the material, causing expansion. If large enough, and if the pressure-drop rate is faster than the natural gas diffusion rate, blistering or rupturing can occur.

**3.1.11****room temperature**

23 (+/- 2)°C

**3.1.12****seal cross-section**

free height of a seal at room temperature, measured normal to seal diameter in the direction of compression in the test. The measurement shall be taken at three circumferentially equi-distributed positions. Also abbreviated to Cross Section Diameter (CSD).

**3.1.13****seal type**

a seal design of specified geometry, size and orientation; for example, an O-ring