

SLOVENSKI STANDARD
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Petroleum and natural gas industries - Materials for use in H₂S-containing environments in oil and gas production - Part 1: General principles for selection of cracking-resistant materials (ISO 15156-1:2009)

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Erdöl- und Erdgasindustrie - Werkstoffe für den Einsatz in H₂S-haltiger Umgebung bei der Öl- und Gasgewinnung - Teil 1: Allgemeine Grundlagen für die Auswahl von gegen Rissbildung beständigen Werkstoffen (ISO 15156-1:2009)

Industries du pétrole et du gaz naturel - Matériaux pour utilisation dans des environnements contenant de l'hydrogène sulfuré (H₂S) dans la production de pétrole et de gaz - Partie 1: Principes généraux pour le choix des matériaux résistant au craquage (ISO 15156-1:2009)

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ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment
77.060	Korozija kovin	Corrosion of metals

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15156-1

October 2009

ICS 75.180.01

Supersedes EN ISO 15156-1:2001

English Version

Petroleum and natural gas industries - Materials for use in H₂S-containing environments in oil and gas production - Part 1: General principles for selection of cracking-resistant materials (ISO 15156-1:2009)

Industries du pétrole et du gaz naturel - Matériaux pour utilisation dans des environnements contenant de l'hydrogène sulfuré (H₂S) dans la production de pétrole et de gaz - Partie 1: Principes généraux pour le choix des matériaux résistant au craquage (ISO 15156-1:2009)

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This European Standard was approved by CEN on 29 September 2009.

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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 CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN ISO 15156-1:2009) 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 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 April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 15156-1:2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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The text of ISO 15156-1:2009 has been approved by CEN as a EN ISO 15156-1:2009 without any modification.

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15156-1Second edition
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**Petroleum and natural gas industries —
Materials for use in H₂S-containing
environments in oil and gas
production —**

Part 1:

**General principles for selection of
cracking-resistant materials****(standards.iteh.ai)**

*Industries du pétrole et du gaz naturel — Matériaux pour utilisation dans
des environnements contenant de l'hydrogène sulfuré (H₂S) dans la
production de pétrole et de gaz —*

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*Partie 1: Principes généraux pour le choix des matériaux résistant au
craquage*

Reference number
ISO 15156-1:2009(E)

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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ISO 15156-1:2009(E)

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 15156-1 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

This second edition cancels and replaces the first edition (ISO 15156-1:2001), of which it constitutes a minor revision, specifically by the following:

- inclusion of changes to Table 1 in line with the version shown in ISO 15156-2 and ISO 15156-3;
- inclusion of changes to Clause 5 to make clearer the roles of those involved in the selection and supply and use of materials;
- replacement of the term “pre-qualified material”.

ISO 15156 consists of the following parts, under the general title *Petroleum and natural gas industries — Materials for use in H₂S-containing environments in oil and gas production*:

- *Part 1: General principles for selection of cracking-resistant materials*
- *Part 2: Cracking-resistant carbon and low-alloy steels, and the use of cast irons*
- *Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys*

Introduction

The consequences of sudden failures of metallic oil and gas field components, associated with their exposure to H₂S-containing production fluids, led to the preparation of the first edition of NACE MR0175, which was published in 1975 by the National Association of Corrosion Engineers, now known as NACE International.

The original and subsequent editions of NACE MR0175 established limits of H₂S partial pressure above which precautions against sulfide stress-cracking (SSC) were always considered necessary. They also provided guidance for the selection and specification of SSC-resistant materials when the H₂S thresholds were exceeded. In more recent editions, NACE MR0175 has also provided application limits for some corrosion-resistant alloys, in terms of environmental composition and pH, temperature and H₂S partial pressures.

In separate developments, the European Federation of Corrosion issued EFC Publication 16 in 1995 and EFC Publication 17 in 1996. These documents are generally complementary to those of NACE though they differed in scope and detail.

In 2003, the publication of the three parts of ISO 15156 and NACE MR0175/ISO 15156 was completed for the first time. These technically identical documents utilized the above sources to provide requirements and recommendations for materials qualification and selection for application in environments containing wet H₂S in oil and gas production systems. They are complemented by NACE TM0177 and NACE TM0284 test methods.

The revision of this part of ISO 15156 involves a consolidation of all changes agreed and published in the Technical Corrigendum 1, ISO 15156-1:2001/Cor.1:2005 and by the Technical Circular 1, ISO 15156-1:2001/Cir.1:2007(E), published by the ISO 15156 maintenance agency secretariat at DIN, Berlin.

The changes were developed by, and approved by the ballot of, representative groups from within the oil and gas production industry. The great majority of these changes stem from issues raised by document users. A description of the process by which these changes were approved can be found at the ISO 15156 maintenance website www.iso.org/iso15156maintenance.

When found necessary by oil and gas production industry experts, future interim changes to this part of ISO 15156 will be processed in the same way and will lead to interim updates to this part of ISO 15156 in the form of Technical Corrigenda or Technical Circulars. Document users should be aware that such documents can exist and can impact the validity of the dated references in this part of ISO 15156.

The ISO 15156 maintenance agency at DIN was set up after approval by the ISO Technical Management Board given in document 34/2007. This document describes the make up of the agency, which includes experts from NACE, EFC and ISO/TC 67/WG 7, and the process for approval of amendments. It is available from the ISO 15156 maintenance website and from the ISO/TC 67 Secretariat. The website also provides access to related documents that provide more detail of ISO 15156 maintenance activities.