MALAYSIAN STANDARD

MS 2285-3:2020

Petroleum and natural gas industries - Materials for use in H2S-containing environments in oil and gas production - Part 3: Cracking-resistant CRAs (corrosion resistant alloys) and other alloys (First revision) (ISO 15156-3:2015, MOD)

ICS: 75.180.01

Descriptors: Equipment for petroleum and natural gas industries in general

DEPARTMENT OF STANDARDS MALAYSIA

DEVELOPMENT OF MALAYSIAN STANDARDS

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The main function of Standards Malaysia is to foster and promote standards, standardisation and accreditation as a means of advancing the national economy, promoting industrial efficiency and development, benefiting the health and safety of the public, protecting the consumers, facilitating domestic and international trade and furthering international cooperation in relation to standards and standardisation.

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Committee representation

The National Standards Committee on Petroleum and Gas (NSC H) under whose authority this Malaysian Standard was adopted, comprises representatives from the following organisations:

Department of Occupational Safety and Health Malaysia
Department of Standards Malaysia (Secretariat)
Energy Commission
Federation of Malaysian Manufacturers - Malaysian Industrial Gases Manufacturers Group
Fire and Rescue Department of Malaysia
Malaysia Automotive, Robotics and IoT Institute
Malaysian Gas Association
Malaysian Oil & Gas Engineering Council
Malaysian Palm Oil Board
Malaysian Plastics Manufacturers Association
Ministry of Domestic Trade and Consumer Affairs
Ministry of International Trade and Industry
Petroliam Nasional Berhad
PETRON Malaysia Refining & Marketing Bhd
Road Transport Department Malaysia
Royal Malaysian Customs Department
Shell Malaysia Trading Sdn Bhd
SIRIM Berhad (Previous Secretariat)
Shell Malaysia Trading Sdn Bhd
The Institution of Engineers, Malaysia
Universiti Kebangsaan Malaysia
Universiti Teknologi Malaysia
Universiti Teknologi PETRONAS

The Technical Committee on Pipeline Transportation which recommended the adoption of the ISO Standard as Malaysian Standard consists of representatives from the following organisations:

Construction Industry Development Board
DNV GL Malaysia Sdn Bhd
Department of Occupational Safety and Health Malaysia
Department of Standards Malaysia (Secretariat)
Energy Commission
Gas Malaysia Berhad
Malaysian Iron and Steel Industry Federation
PETRONAS Gas Berhad
PETRONAS Group Technical Solutions
PETRONAS Research Sdn Bhd
SIRIM Berhad (Previous Secretariat)
The Institution of Engineers, Malaysia
Universiti Malaysia Pahang
Universiti Teknologi PETRONAS
Wasco Coatings Malaysia Sdn Bhd

National Foreword

The adoption of the ISO Standard as a Malaysian Standard was recommended by the Technical Committee on Pipeline Transportation under the authority of the National Standards Committee on Petroleum and Gas.

This Malaysian Standard is a modified adoption of ISO 15156-3:2015, *Petroleum and natural gas industries - Materials for use in H2S containing environments in oil and gas production - Part 3: Cracking-resistant CRAs (corrosion resistant alloys) and other alloys,* published by the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) with the following modifications:

a) in the source text, "this International Standard" should read "this Malaysian Standard";

b) the comma which is used as a decimal sign (if any), to read as a point;

c)

Clause/Subclause	**Modifications**
Table 1 List of equipment	Remove “water injection and water disposal equipment” from permitted exclusion and footnote

Explanation: This standard removes “the water injection and water disposal equipment” because the reference standard NACE RP0475 Selection of metallic materials to be used in all phases of water handling for injection into oil-bearing formation has been withdrawn without replacement.

d) reference to International Standards should be replaced by corresponding Malaysian Standards as follows:

Referenced International Standards	Corresponding Malaysian Standards
ISO 15156-1, *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*	MS 2285-1, *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 15156-2, *Petroleum and natural gas industries - Materials for use in H2S containing environments in oil and gas production - Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons*	MS 2285-2, *Petroleum and natural gas industries - Materials for use in H2S containing environments in oil and gas production - Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons*

MS 2285 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

National Foreword *(continued)*

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

This Malaysian Standard cancels and replaces MS 2285-3:2010, Petroleum and natural gas industries - Materials for use H2S containing environments in oil and gas production - Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys.

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

NOTE. MOD on the front cover indicates a modified standard i.e. a standard adapted from an International Standard with permitted technical deviations, which are clearly identified and explained. The changes in structure are permitted provided that the altered structure permits easy comparison of the content of the two standards. Modified standards also include the changes permitted under identical correspondence.

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

This third edition cancels and replaces the second edition (ISO 15156-3:2009), which has been technically revised with the following changes:

— replacement in the Scope of the term "conventional elastic design criteria" by the term "load controlled design methods";

— refinements to 6.3 to require the use of absolute values when F_{PREN} is calculated for use in this part of ISO 15156;

— acceptance of the environmental limits for low carbon 300 series stainless steels also for their dual certified grades;

— changes to some of the tables of Annex A to more conservatively reflect the current knowledge of the limits of use of some materials;

— changes to the definition of acceptable limits to *in situ* production environment pH in some tables of Annex A;

— additions to a number of tables of Annex A of new sets of acceptable environmental limits for (new) materials and their associated metallurgical requirements.

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*