



SLOVENSKI STANDARD
SIST EN ISO 17349:2016

01-maj-2016

Industrija za predelavo nafte in zemeljskega plina - Ploščadi na morju z oskrbo s paro z visoko vsebnostjo CO2 pri visokem tlaku (ISO 17349:2016)

Petroleum and natural gas industries - Offshore platforms handling streams with high content of CO2 at high pressures (ISO 17349:2016)

Erdöl-, petrochemische und Erdgasindustrie - Dampf mit hohem CO2 Gehalt bei hohen Drücken und hohen Durchflussraten - Richtlinien (ISO 17349:2016)

Industries du pétrole et du gaz naturel - Plates-formes en mer traitant des courants à fort teneur en CO2 à haute pression (ISO 17349:2016)

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Ta slovenski standard je istoveten z: EN ISO 17349:2016

ICS:

75.180.10	Oprema za raziskovanje in odkopavanje	Exploratory and extraction equipment
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EUROPEAN STANDARD

EN ISO 17349

NORME EUROPÉENNE

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English Version

Petroleum and natural gas industries - Offshore platforms handling streams with high content of CO₂ at high pressures (ISO 17349:2016)

Industries du pétrole et du gaz naturel - Plates-formes
en mer traitant des courants à fort teneur en CO₂ à
haute pression (ISO 17349:2016)

Erdöl-, petrochemische und Erdgasindustrie - Dampf
mit hohem CO₂ Gehalt bei hohen Drücken und hohen
Durchflussraten - Richtlinien (ISO 17349:2016)

This European Standard was approved by CEN on 10 January 2016.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN ISO 17349:2016) 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 NEN.

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of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

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INTERNATIONAL
STANDARD

ISO
17349

First edition
2016-02-15

**Petroleum and natural gas
industries — Offshore platforms
handling streams with high content of
CO₂ at high pressures**

*Industries du pétrole et du gaz naturel — Plates-formes en mer
traitant des courants à fort teneur en CO₂ à haute pression*

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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.

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).

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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*.

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ISO 17349:2016(E)**Introduction**

In recent years, the oil industry has been facing challenges in developing and operating high-CO₂ content offshore fields. The CO₂-rich streams, separated from the produced natural gas, can be injected to enhance oil recovery from the reservoirs. Even in cases where the oil recovery increase is not so significant, operators have to consider the CO₂-rich stream compression and injection, in order to avoid its venting to the atmosphere.

Main concerns comprise surface safety system and material selection areas, which lack specific standards and regulations for this scenario. The commercial tools available, for instance, to model the dispersion of gases, need to be validated for CO₂ and CO₂/hydrocarbon mixtures, which have distinctive thermodynamic behaviour. This will affect the choice of materials and plant design.

This International Standard addresses concepts and criteria for processing CO₂-rich streams, as a supplement to existing standards for offshore installations.

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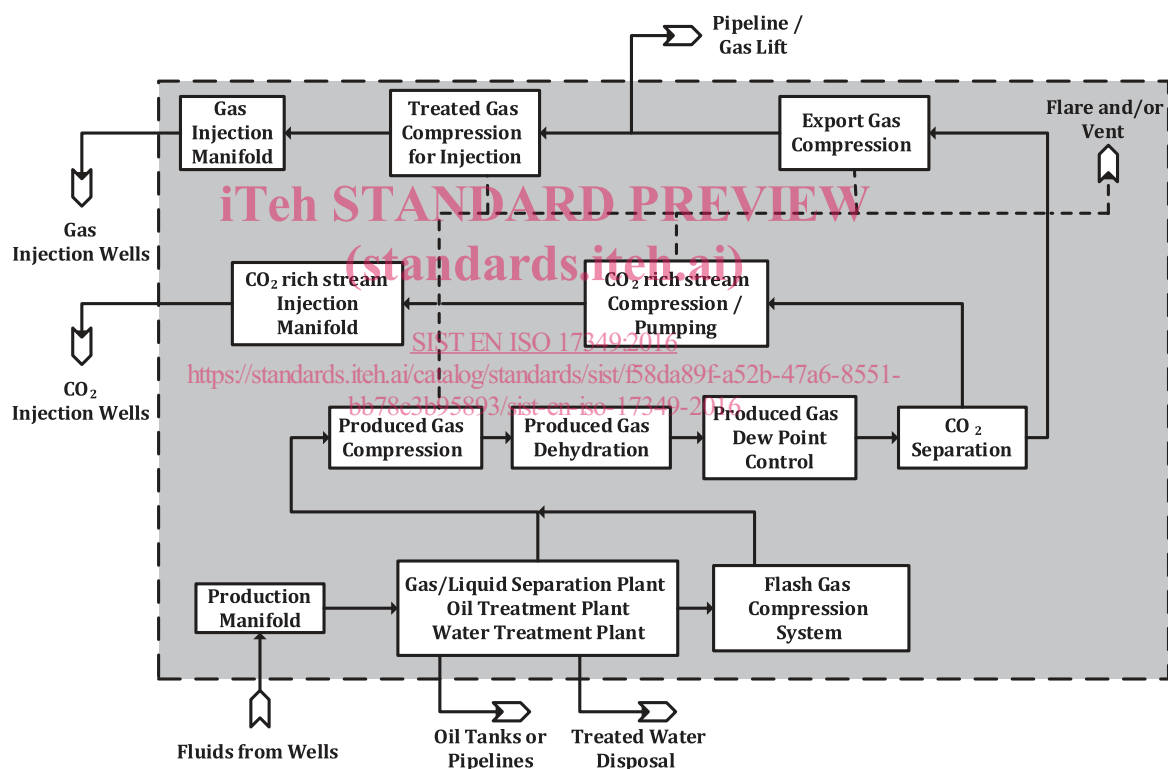
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Petroleum and natural gas industries — Offshore platforms handling streams with high content of CO₂ at high pressures

1 Scope

This International Standard contains provisions for design of topside facilities for offshore plants handling CO₂-rich streams at high pressures; i.e. CO₂ molar concentration above 10 %. The surface systems include usual offshore process unit operations, as shown in [Figure 1](#).

This International Standard is applicable only to topside facilities of fixed and floating oil and gas production offshore units up to the last barrier, such as an ESDV. Subsea production systems and Cryogenic CO₂ separation are not covered.



NOTE This example is within the scope of this International Standard.

Figure 1 — Example of a Process Flow Diagram (in grey zone)

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies..

ISO 13702, *Petroleum and natural gas industries — Control and mitigation of fires and explosions on offshore production installations — Requirements and guidelines*

ISO 17349:2016(E)

ISO 15156 (all parts), *Petroleum and natural gas industries — Materials for use in H₂S-containing environments in oil and gas production*

ISO 21457, *Petroleum, petrochemical and natural gas industries — Materials selection and corrosion control for oil and gas production systems*

ISO 23936-1, *Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production — Part 1: Thermoplastics*

ISO 23936-2:2011, *Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production — Part 2: Elastomers*

API STD 521, *Pressure-relieving and Depressuring Systems, API Standard, January 2014*

3 Terms and definitions

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

3.1 compressibility factor

Z

thermodynamic property for modifying the ideal gas law to account for the real gas behaviour

**3.2 corrosion resistant alloy
CRA**

alloy intended to be resistant to general and localized corrosion by oil field environments that are corrosive to carbon steels

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[SOURCE: ISO 15156-1:2015, 3.6]

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3.3 dense phase

fluid state (supercritical or liquid) above critical pressure

**3.4 equation of state
EOS**

thermodynamic equation describing the state of matter under a given set of physical conditions

3.5 free water

water not dissolved in the CO₂-rich stream

Note 1 to entry: This can be pure water, water with dissolved salts, water wet salts, water glycol mixtures or other mixtures containing water.

3.6 gas-assisted flare

flare with gas assistance system in order to increase gas net heating value

3.7 high-velocity tip flare

flare with gas exit velocities higher than 122 m/s

3.8 high-velocity vent

vent with gas exit velocities higher than 150 m/s

3.9**hydrate**

solid, crystalline compound of water and light hydrocarbons or CO₂, in which the water molecules combine with the gas molecules to form a solid

3.10**CRA clad**

metallic coating of CRA in which the bond between the parent metal and liner is metallurgical

3.11**low-velocity tip flare**

flare with gas exit velocities lower than 122 m/s

3.12**low-velocity vent**

vent with gas exit velocities lower than 150 m/s

3.13**minimum design temperature**

minimum temperature below which the application limits for the materials involved are exceeded

3.14**platform**

complete assembly, including structure, topsides, foundations and stationkeeping systems

[SOURCE: ISO 19900:2013, 3.35]

3.15**rapid gas decompression****RGD****depressurization****explosive decompression**

rapid pressure-drop in a high pressure gas-containing system which disrupts the equilibrium between external gas pressure and the concentration of gas dissolved inside any polymer, with the result that excess gas tries to escape from the solution at points throughout the material, causing expansion

[SOURCE: ISO 23936-2:2011, 3.1.10]

3.16**supercritical phase**

fluid state above critical pressure and temperature

3.17**topsides**

structures and equipment placed on a supporting structure (fixed or floating) to provide some or all of a platform's functions

Note 1 to entry: For a ship-shaped floating structure, the deck is not part of the topsides.

Note 2 to entry: For a jack-up, the hull is not part of the topsides.

Note 3 to entry: A separate fabricated deck or module support frame is part of the topsides.

[SOURCE: ISO 19900:2013, 3.52]

3.18**triple point**

temperature and pressure where CO₂ exists as a gas, liquid and solid simultaneously