

STN	Zachytávanie oxidu uhličitého, preprava a geologické skladovanie Potrubné prepravné systémy (ISO 27913: 2024)	STN EN ISO 27913 83 8500
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Carbon dioxide capture, transportation and geological storage - Pipeline transportation systems (ISO 27913:2024)

Táto norma obsahuje anglickú verziu európskej normy.

This standard includes the English version of the European Standard.

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English Version

Carbon dioxide capture, transportation and geological storage - Pipeline transportation systems (ISO 27913:2024)

Captage, transport et stockage géologique du dioxyde de carbone - Systèmes de transport par conduites (ISO 27913:2024)

Abscheidung, Transport und geologische Speicherung von Kohlenstoffdioxid - Rohrleitungstransportsysteme (ISO 27913:2024)

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EN ISO 27913:2025 (E)

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European foreword

The text of ISO 27913:2024 has been prepared by Technical Committee ISO/TC 265 "Carbon dioxide capture, transportation, and geological storage" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 27913:2025 by Technical Committee CEN/TC 474 "Carbon dioxide Capture, transportation, Utilisation, and Storage (CCUS)" 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of an identical text or by endorsement, at the latest by December 2025, and conflicting national standards shall be withdrawn at the latest by December 2025.

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International Standard

ISO 27913

Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems

*Captage, transport et stockage géologique du dioxyde de
carbone — Systèmes de transport par conduites*

**Second edition
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ISO 27913:2024(en)



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ISO 27913:2024(en)**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 document 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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 265, *Carbon dioxide capture, transportation, and geological storage*.

This second edition cancels and replaces the first edition (ISO 27913:2016), which has been technically revised.

The main changes are as follows:

- the entire text has been editorially revised;
- normative references have been updated;
- a subclause about CO₂ stream flowrate and impurity measurement has been added;
- the level of impurities has been limited to 5 % and a set of 17 requirements are defined to ensure CO₂ stream pipeline integrity;
- [Annex A](#) has been added to show example compositions of CO₂ streams for gaseous and dense phase CO₂ streams which fulfil the requirements of this document;
- the latest findings in fracture arrest design have been included in [Annex D](#);
- [Annex F](#) has been added to describe the decompression effects on pressure and temperature versus time.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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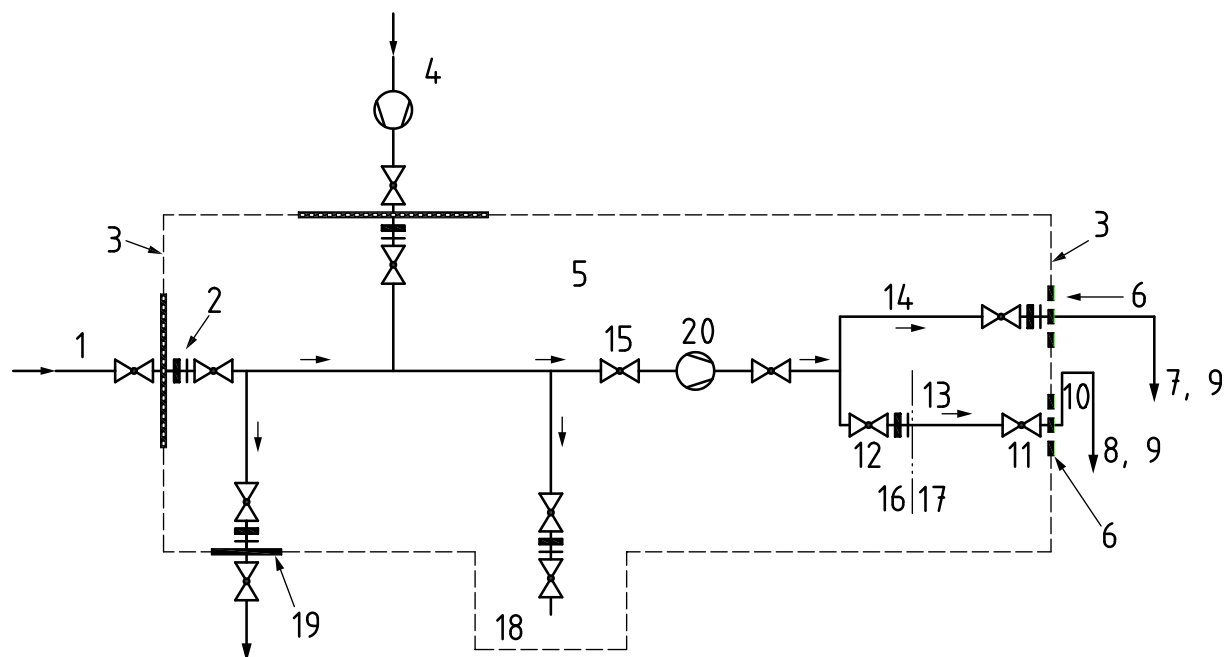
Introduction

Carbon dioxide (CO₂) capture, carbon dioxide use (CCU) and carbon dioxide storage (CCS) have been identified as key abatement technologies for achieving a significant reduction in CO₂ emissions to the atmosphere. Pipelines are likely to be the primary means of transporting CO₂ from the point-of-capture to storage sites (e.g. depleted hydrocarbon formations, deep saline aquifers), or to usage points (e.g. enhanced oil recovery or utilization) to avoid its release to the atmosphere. While there is a perception that transporting CO₂ via pipelines does not represent a significant barrier to implementing large-scale CCS, there is significantly less industry experience than there is for hydrocarbon service (e.g. natural gas). Furthermore, there are a number of issues that need to be adequately understood and associated risks that need to be effectively managed to ensure safe transport of CO₂. In a CCS or CCU context, there is a need for larger CO₂ pipeline systems in more densely populated areas and with CO₂ coming from multiple sources. Also, offshore pipelines for the transportation of CO₂ to offshore storage sites are likely to become common.

The objective of this document is to provide specific requirements and recommendations on certain aspects of safe and reliable design, construction and operation of pipelines intended for the large-scale transportation of CO₂ that are not already covered in existing pipeline standards such as ISO 13623, ASME B31.4, ASME B31.8, EN 1594, AS 2885 or other standards listed in the Bibliography. Existing pipeline standards cover many of the issues related to the design and construction of CO₂ pipelines. However, there are some CO₂-specific issues (e.g. fracture arrest, internal corrosion protection) that are not adequately covered in these standards but are addressed in this document. The purpose of this document is to cover these issues consistently. Hence, this document is not a standalone standard, but is written to be a supplement to other existing pipeline standards for natural gas or liquids for both onshore and offshore pipelines.

The system boundary (see [Figure 1](#)) between capture and transportation is the point at the inlet valve of the pipeline, where the composition, temperature and pressure of the CO₂ stream is within a certain specified range to meet the requirements for transportation as described in this document.

The boundary between transportation and storage or utilization is the point where the CO₂ stream leaves the transportation pipeline infrastructure and enters the downstream infrastructure, which can be permanent geological storage, utilization or buffer storage prior to shipping.

ISO 27913:2024(en)**Key**

- 1 source of CO₂ from capture (e.g. from power plant, industry; see ISO/TR 27912)
- 2 isolating joint
- 3 boundary limit
- 4 other source of CO₂
- 5 transportation system inside given in this document
- 6 boundary to storage facility or utilization
- 7 onshore storage facility
- 8 offshore storage facility
- 9 enhanced oil recovery
- 10 riser (outside transportation scope)
- 11 subsea valve (inside transportation scope)
- 12 beach valve
- 13 offshore pipeline
- 14 onshore pipeline
- 15 valve
- 16 landfall
- 17 open water
- 18 third party transport system
- 19 export to other uses than those of Keys 7, 8 and 9
- 20 intermediate compression or pumping

Figure 1 — Schematic illustration of the system boundaries of this document

Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems

1 Scope

This document specifies the requirements and recommendations for the transportation of CO₂ streams from the capture site to the storage facility where it is primarily stored in a geological formation or used for other purposes (e.g. for enhanced oil recovery or CO₂ use).

This document applies to the transportation of CO₂ streams by

- rigid metallic pipelines,
- pipeline systems,
- onshore and offshore pipelines for the transportation of CO₂ streams,
- conversion of existing pipelines for the transportation of CO₂ streams, and
- transportation of CO₂ streams in the gaseous and dense phases.

This document also includes aspects of CO₂ stream quality assurance, as well as converging CO₂ streams from different sources.

Health, safety and environment aspects specific to CO₂ transport and monitoring are also considered in this document.

Transportation of CO₂ via ship, rail or on road is not covered in this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3183, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems*

ISO 20765-2, *Natural gas — Calculation of thermodynamic properties — Part 2: Single-phase properties (gas, liquid, and dense fluid) for extended ranges of application*

ISO/TR 27925, *Carbon dioxide capture, transportation and geological storage — Cross cutting issues — Flow assurance*

API SPEC 5L, *Line Pipe, 46th Edition, April 2018*

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