



International

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

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

ISO 27913

**Second edition
2024-10**

**Corrected version
2025-09**

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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.

This corrected version of ISO 27913:2024 incorporates the following correction: " t_{\min} " has been corrected to " T_{\min} " in [8.1.7](#).

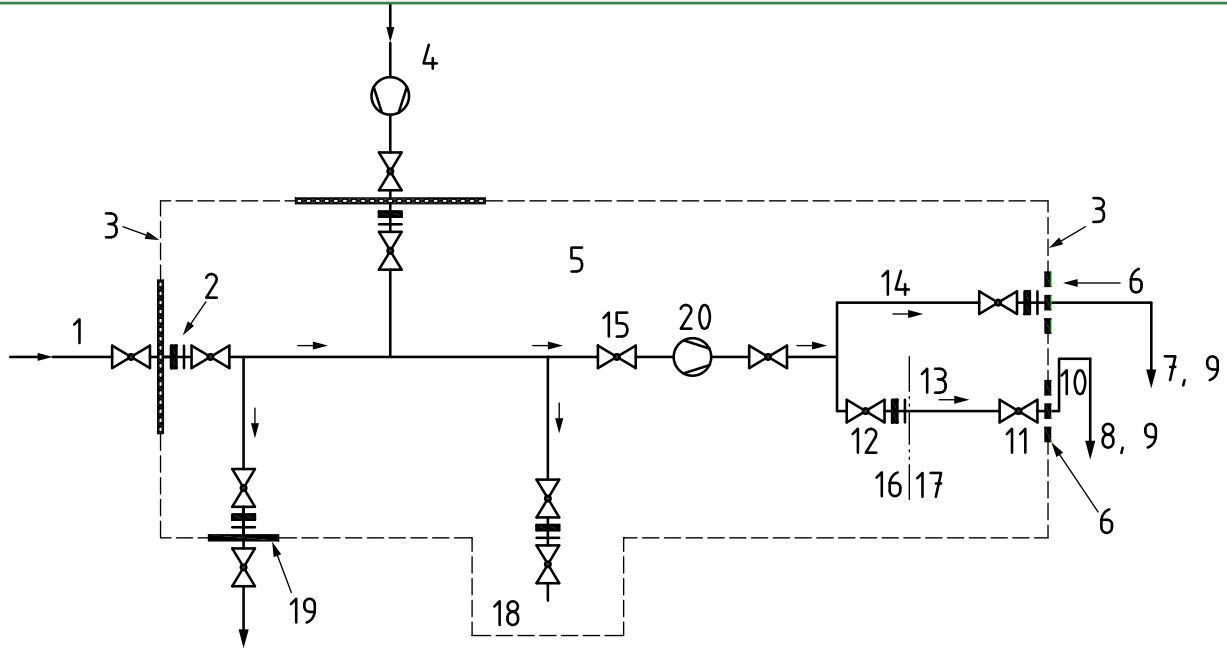
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Carbon dioxide (CO₂) capture, carbon dioxide use (CCU) and carbon dioxide storage (CCS) have been identified as key abatement technologies for achieving a significant reduction in CO₂ emissions to the atmosphere. Pipelines are likely to be the primary 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.



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