
Lastnosti tokov ogljikovega dioksida v cevovodih iz ogljikovega jekla

Properties of carbon dioxide streams in carbon steel pipelines

Eigenschaften von Kohlenstoffdioxidströmen in Kohlenstoffstahlleitungen

Propriétés des flux de dioxyde de carbone dans les conduites en acier carbone

Ta slovenski standard je istoveten z: prEN 18397**ICS:**

13.020.40	Onesnaževanje, nadzor nad onesnaževanjem in ohranjanje	Pollution, pollution control and conservation
23.040.10	Železne in jeklene cevi	Iron and steel pipes

oSIST prEN 18397:2026**en,fr,de**

Sample Document

get full document from standards.iteh.ai

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 18397

August 2026

ICS 23.040.10

English Version

**Properties of carbon dioxide streams in carbon steel
pipelines**

Propriétés des flux de dioxyde de carbone dans les
conduites en acier carbone

Eigenschaften von Kohlenstoffdioxidströmen in
Kohlenstoffstahlleitungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 474.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2026 CEN All rights of exploitation in any form and by any means reserved
worldwide for CEN national Members.

Ref. No. prEN 18397:2026 E

Contents	Page
European foreword	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions.....	5
4 Symbols and units.....	6
5 Properties of CO₂ streams.....	7
5.1 General.....	7
5.2 Thermodynamics	7
5.3 Multiphase range	7
5.4 Solubility of water in CO ₂	8
5.5 Mixing different CO ₂ streams.....	8
6 Further design and operating parameters for CO₂ stream pipelines	8
6.1 Expansion behaviour of CO ₂ and CO ₂ streams	8
6.2 Impact of CO ₂ stream composition on density	9
6.3 Effects of water content	10
6.4 Effects of selected impurities.....	10
6.5 Chemical reactions	12
6.6 Operating ranges.....	12
6.7 Requirements for the CO ₂ stream to maintain line integrity from EN ISO 27913	12
6.8 Limit values for the CO ₂ stream	12
Annex A (informative) Background information on CO₂ properties.....	14
A.1 Properties of pure CO ₂	14
A.2 Thermodynamics	14
Annex B (informative) Limits for impurities	20
B.1 CO ₂ minimum purity	20
B.2 Impurities forming strong acids.....	20
B.3 Glycols	22
B.4 Amines	23
B.5 H ₂	23
B.6 Total non-condensables (e.g. N ₂ , Ar, CH ₄ , O ₂ , H ₂ , CO).....	23
B.7 CO	25
Bibliography	26

European foreword

This document (prEN 18397:2026) has been prepared by Technical Committee CEN/TC 474 “Carbon dioxide Capture, transportation, Utilisation, and Storage (CCUS)”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

Sample Document

get full document from standards.iteh.ai

Introduction

This document describes the characteristics of carbon dioxide (CO₂) streams and gives requirements and recommendations for the properties of CO₂ streams for transportation in carbon steel pipelines that have the potential to influence pipeline integrity. It includes matters related to corrosion, ductile fracture and thermophysical effects. It also contains information on the effects of CO₂ streams on the design and operation of CO₂ pipeline transportation systems.

For the purposes of this document, a CO₂ stream is predominantly composed of CO₂, which either results from a CO₂ capture process or from the purification of a CO₂-rich stream, and are transported to storage sites or for further utilization. Storage and utilization might impose additional requirements concerning CO₂ stream composition not covered in this document.

The different sources of CO₂ streams result in different impurity contents, which in turn, apart from integrity considerations, also have a major influence on the design and operation of CO₂ transport pipelines. In the following, the possible influences and consequences of impurities for transportation in carbon steel pipelines are described in more detail.

The behaviour of impurities within CO₂ streams in pipeline transport described in this document has, where it is available, been based on experimental or operational experience.

Where this experience is not currently available, the current state of knowledge is presented and no firm statements on limit values have been made. Reference is further made to required research. Once appropriate experience has been gained definition of limit values is expected.

Sample Document

get full document from standards.iteh.ai

1 Scope

This document specifies requirements for the composition of CO₂ streams relevant to the integrity of carbon steel pipeline systems, including limits on non-condensable components. It establishes the framework conditions for the supply, transportation and distribution of CO₂ streams. Considerations related to the health effects of the CO₂ stream (e.g. toxicity), environmental impact, or other properties of impurities are outside the scope of 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.

prEN 18329, *Measurement of CO₂ streams - Sampling and analysis for pipeline transportation*

EN ISO 27913:2025, *Carbon dioxide capture, transportation and geological storage — Pipeline transportation systems (ISO 27913:2024)*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 carbon dioxide stream CO₂ stream

stream consisting overwhelmingly of CO₂ (usually > 95 mol-%)

3.2 dense phase

CO₂ or CO₂ streams in the single-phase fluid state above a density of 500 kg/m³

[SOURCE: EN ISO 27913:2025, 3.9]

3.3 aqueous phase

liquid water-containing phase

3.4 non-condensable

impurity which, as pure substance, cannot be liquefied by increasing the pressure at the operating temperatures of the pipelines considered in this document

Note 1 to entry: When pure, they are in gaseous or supercritical state at possible CO₂ equilibrium conditions throughout the CO₂ value chain. This is true for impurities with a critical temperature below the minimum operating temperature. The presence of a non-condensable results in an increase of the bubble point pressure of a CO₂ stream containing this impurity.