PD ISO/TR 27912:2016

BSI Standards Publication

Carbon dioxide capture — Carbon dioxide capture systems, technologies and processes

bsi.

National foreword

This Published Document is the UK implementation of ISO/TR 27912:2016.

The UK participation in its preparation was entrusted to Technical Committee PSE/265, Carbon Capture Transportation and Storage.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2016

ISBN 978 0 580 84767 7
ICS 13.020.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2016.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TR 27912:2016

TECHNICAL REPORT

ISO/TR 27912

First edition
2016-05-15

Carbon dioxide capture — Carbon dioxide capture systems, technologies and processes

Capture du dioxyde de carbone — Systèmes de capture du dioxyde de carbone, technologies et processus

Reference number
ISO/TR 27912:2016(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 265, *Carbon dioxide capture, transportation, and geological storage*.

Introduction

Carbon capture and storage (CCS) is a technology to mitigate climate change. Many demonstration projects have been conducted worldwide, and CO_2 capture is an important process in CCS and is cost and energy intensive.

CO_2 capture in power industry could be classified through pre, post and oxy combustion. Technologies such as chemical and physical absorption, adsorption, and membrane separation are currently under development and are in various stages of maturity from commercial (110 MW)[1] large-scale demonstrations to laboratory-scale evaluation, and should be delivered at low cost and low energy consumption.

The objectives of this Technical Report are to specify and review existing capture technologies, equipment and processes and comprehend CO_2 capture systems so that this Technical Report can provide stakeholders with the guidance and knowledge necessary to develop a series of standards for CO_2 capture and build consensus on this standardization work in advance.

This Technical Report describes CO_2 capture systems based on published papers and other documents and then summarizes the different issues deemed most important by ISO/TC 265. This includes the following:

— boundary for CO_2 capture systems;

— technologies, equipment and processes;

— CO_2 streams, gas streams and emissions, processes and waste products;

— evaluation procedures for capture performance;

— safety issues on each capture system;

— reliability issues on each capture system;

— management system.

Carbon dioxide capture — Carbon dioxide capture systems, technologies and processes

1 Scope

This Technical Report describes the principles and information necessary to clarify the CO_2 capture system and provide stakeholders with the guidance and knowledge necessary for the development of a series of standards for CO_2 capture. This Technical Report also covers technologies, equipment and processes specific to CO_2 capture from the viewpoints of the international standardization for the implementation of CCS.

The purpose of this Technical Report is to provide guidance for the development of an ISO document related to CO_2 capture as part of a CCS chain. This Technical Report covers CO_2 capture systems applicable to CO_2 emission sources and their respective boundaries, as well as capture technologies, equipment and processes. In addition, it can be used for the development of International Standards under TC 265.

The following issues are to be excluded from this Technical Report:

— industrial use of CO_2;

— compression of CO_2 (not described in detail);

— terminologies not used in this Technical Report.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

3.1
absorbent
substance able to absorb liquid or gas

3.2
affinity
tendency of substances to react with each other

Note 1 to entry: Also defined as the decrease in Gibbs energy on going from the reactants to the products of a chemical reaction.

[SOURCE: IUPAC Compendium of Chemical Terminology]

3.3
air separation unit
unit separating oxygen, nitrogen and other inert gases from air which delivers the reqired oxygen for gasification or combustion applications in the context of CCS

3.4
alkanolamine
chemical compound that carries hydroxy (–OH) and amino ($–NH_2$, –NHR, and $–NR_2$) functional groups on an alkane backbone

