GAASIBALLOONID. KORDUVTÄIDETAVAD ÕMBLUSTETA TERASEST GAASIBALLOONID JA -TORUD. AKUSTOEMISSIOONKONTROLL (AT) JA JÄRELUURINGUNA ULTRAHELIKONTROLL (UT) PERIOODILISEKS INSPEKTEERIMISEKS JA KATSETE TEOSTAMISEKS

Gas cylinders - Refillable seamless steel gas cylinders and tubes - Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing (ISO 16148:2016)

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16148:2016 sisaldab Euroopa standardi EN ISO 16148:2016 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16148:2016 consists of the English text of the European standard EN ISO 16148:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 27.04.2016.	Date of Availability of the European standard is 27.04.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN ISO 16148

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English Version

Gas cylinders - Refillable seamless steel gas cylinders and tubes - Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing (ISO 16148:2016)

Bouteilles à gaz - Bouteilles à gaz rechargeables en acier sans soudure et tubes - Essais d'émission acoustique et examen ultrasonique complémentaire pour l'inspection périodique et l'essai (ISO 16148:2016)

Gasflaschen - Wiederbefüllbare nahtlose Gasflaschen und Großflaschen aus Stahl - Schallemissionsprüfung und nachfolgende Ultraschallprüfung für die wiederkehrende Inspektion und Prüfung (ISO 16148:2016)

This European Standard was approved by CEN on 28 November 2015.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 16148:2016) has been prepared by Technical Committee ISO/TC 58 “Gas cylinders” in collaboration with Technical Committee CEN/TC 23 “Transportable gas cylinders” the secretariat of which is held by BSI.

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 October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 16148:2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 16148:2016 has been approved by CEN as EN ISO 16148:2016 without any modification.

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).

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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 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 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.

This second edition cancels and replaces the first edition (ISO 16148:2006), which has been technically revised. The changes include

a) expansion of the scope to include tubes of water capacity up to 3 000 l used for compressed and liquefied gases, and

b) addition of procedures for ultrasonic examination (UT) follow-up during periodic inspection, as described in the new Annex A.

Introduction

In recent years, new non-destructive examination (NDE) techniques have been successfully introduced as an alternative to the conventional testing procedures of gas cylinders, tubes and other cylinders at the time of periodic inspection and testing.

One of the alternative NDE methods for certain applications is acoustic emission examination (AT), which has proved to be an acceptable test method applied during periodic inspection and testing in some countries.

The test method requires pressurization to a level greater than the normal filling pressure.

The pressurization medium can be either gas or liquid.

Acoustic emission (AE) measurements are used to detect and locate emission sources. Other NDE methods are needed to evaluate the significance of AE detected sources. One of the alternative NDE methods used as a follow-up to AT is ultrasonic examination (UT), which has proved to be an acceptable testing method applied during periodic inspection and testing. The purpose of this International Standard is to provide a procedure for locating, detecting and evaluating the relevance of AE indications such as those from longitudinally oriented crack-like discontinuities. The shear wave (angle beam) UT method is intended to be used immediately following AT to evaluate the significance of AE indications.

This International Standard describes two methods of AT, defined as Method A and Method B, and a method of follow-up UT.

With the agreement of the testing and certifying body approved by the competent authority of the country of approval, the hydraulic pressure test of cylinders and tubes can be replaced by an equivalent AT/UT Method A or B.

This International Standard is intended to be used under a variety of national regulatory regimes, but has been written so that it is suitable for the application of Reference.[1] Attention is drawn to requirements in the specified relevant national regulations of the country (countries) where the cylinders are intended to be used that might override the requirements given in this International Standard. Where there is any conflict between this International Standard and any applicable regulation, the regulation always takes precedence.

Gas cylinders — Refillable seamless steel gas cylinders and tubes — Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing

1 Scope

This International Standard gives procedures for the use of acoustic emission examination (AT) and ultrasonic examination (UT) follow-up during the periodic inspection and testing of seamless steel cylinders and tubes with a water capacity of up to 3 000 l used for compressed and liquefied gases. This examination provides acoustic emission (AE) indications and locations that are evaluated by a secondary examination using UT for a possible flaw in the cylinder or tube. Methods other than UT for the secondary examination are not covered by this International Standard.

This International Standard does not cover composite cylinders.

CAUTION — Some of the tests specified in this International Standard involve the use of processes which could lead to a hazardous situation.

2 Normative references

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

ISO 5577, *Non-destructive testing — Ultrasonic inspection — Vocabulary*

ISO 6406, *Gas cylinders — Seamless steel gas cylinders — Periodic inspection and testing*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 12716, *Non-destructive testing — Acoustic emission inspection — Vocabulary*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

EN 13477-1, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 1: Equipment description*

EN 13477-2, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 2: Verification of operating characteristic*

ASTM E1419, *Standard Practice for Examination of Seamless, Gas-Filled, Pressure Vessels using Acoustic Emission*

ASNT SNT-TC-1A, *Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5577, ISO 12716 and the following apply.