INTERNATIONAL STANDARD

ISO 16148

First edition 2006-05-01

Gas cylinders — Refillable seamless steel gas cylinders — Acoustic emission testing (AT) for periodic inspection

Bouteilles à gaz — Bouteilles à gaz rechargeables sans soudure — Essais d'émmision acoustique pour contrôle périodique



Reference number ISO 16148:2006(E)

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Foreword

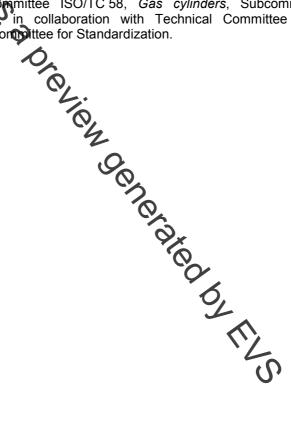
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ISO 16148 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*, in collaboration with Technical Committee CEN/TC 23, *Transportable gas cylinders*, of the European Compittee for Standardization.



Introduction

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

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

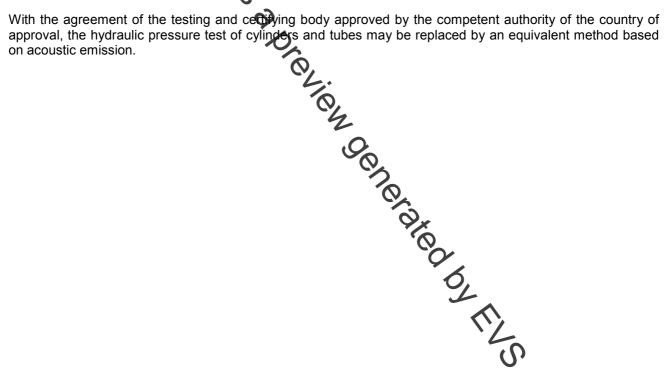
The test method requires pressurization to a level greater than the normal filling pressure.

The pressurization median may 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. Procedures for other NDE techniques are beyond the scope of this International Standard. For example, shear wave, angle beam ultrasonic inspection is commonly used to establish the exact position and dimensions of flaws that produce AE.

This International Standard includes two methods of AT and, for the purpose of differentiation, the methods are addressed as Method A and Method B (see Clause 3).

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Gas cylinders — Refillable seamless steel gas cylinders — Acoustic emission testing (AT) for periodic inspection

1 Scope

This International Standard is a guideline for using acoustic emission testing (AT) during re-qualification of seamless steel cylinders and tubes of water capacity up to 3 000 I used for compressed and liquefied gases. For cylinders below 20 radiational precautions may be taken due to the potential reflections from the ends. This examination provides indications and locations that should be evaluated by another examination for a possible flaw in the cylinder. This International Standard covers monolithic steel cylinders.

2 Normative references

The following referenced documents are indispensable for the application 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 6406, Gas cylinders — Seamless steel gas cylinders — Periodic inspection and testing

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

EN 1330-9, Non-destructive testing — Terminology — Part 9: Terms used in acoustic emission testing

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1330-9 and the following apply.

3.1

fracture critical flaw

defect that is large enough to exhibit unstable crack growth under certain service conditions

3.2

working pressure

settled pressure at a uniform temperature of 288 K (15 °C) for a full gas cylinder with the maximum permissible charge of compressed gas

NOTE 1 In North America service pressure is often used to indicate a similar condition, usually at 21,1 °C (70 °F).

NOTE 2 For compressed gases, this value is usually stamped on the cylinder.