



DPC: 16 / 30334714 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Interested committees:

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Responsible Committee Secretary: **Mrs Sarah Meagher (BSI)**
Direct tel: **020 8996 7175**
E-mail: sarah.meagher@bsigroup.com

Introduction

This draft standard is based on international discussions in which the UK has taken an active part. Your comments on this draft are invited and will assist in the preparation of the consequent standard. Comments submitted will be reviewed by the relevant BSI committee before sending the consensus UK vote and comments to the international secretariat, which will then decide appropriate action on the draft and the comments received.

If the international standard is approved, it is possible the text will be published as an identical British Standard.

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Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	(7)
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT INTERNATIONAL STANDARD

ISO/DIS 20485

ISO/TC 135/SC 6

Secretariat: JISC

Voting begins on:
2016-08-30

Voting terminates on:
2016-11-21

Non-destructive testing — Leak testing — Tracer gas method

Essais non destructifs — Contrôle d'étanchéité — Méthode par gaz traceur

ICS: 19.100

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ISO/CEN PARALLEL PROCESSING



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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
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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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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 135 "Non-destructive testing", the secretariat of which is held by JISC.

Annex A is informative.

Non-destructive testing — Leak testing — Tracer gas method

1 Scope

This standard describes the techniques to be applied for the detection of a leak, using a tracer gas and a tracer gas specific leak detector.

2 Normative references

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

EN 1779, *Non-destructive testing — Leak Testing — Criteria for method and technique selection*

EN 13625:2001, *Non-destructive testing — Leak test — Guide to the selection of instrumentation for the measurement of gas leakage*

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

ISO 20484, *Non-destructive testing — Leak testing — Vocabulary*

ISO/DIS 20486, *Non-destructive testing — Leak test — Calibration of gaseous reference leaks*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in ISO 20484 apply.

4 Principles of detection

A partial pressure difference of tracer gas is created across the boundary of the object to be tested. The tracer gas, having passed through the leak, is revealed by its physical or chemical properties. Chemical detection is generally based on reactions that cause a local colour change (the object surface shall therefore be visible).

Detection based on physical properties usually involves a sensor, for example:

- a mass spectrometer, tuned for the specific tracer gas used (generally helium-4);
- an alkali ion diode, for halogen gas, and electron-capture equipment (i.e. for SF₆);
- a Pirani gauge, for tracer gas with thermal conductivity different from that of the ambient atmosphere;
- a photometer, with band-pass filter in the frequency range of the tracer gas absorption or emission.

These types of detection generally give an electrical signal which varies with the tracer gas partial pressure.

5 Generation and detection of tracer gas flow

Two basic techniques are used — see EN 1779.

5.1 Tracer gas flows into the object (Group A techniques)

A pressure difference across the wall is obtained either by evacuation of the object, e.g. through a connection or by placing it in a pressurized chamber. Usually the test object is evacuated. Tracer gas is then applied to the external surface using a probe jet or by enclosing the object (totally or partially) in a hood or chamber filled with the tracer gas. Tracer gas leakage into the test object is detected by a sensor within or connected to the internal volume.

5.2 Tracer gas flows out of the object (Group B techniques)

The object is filled with a tracer gas. A pressure difference across the wall is obtained either by pressurization of the object, e.g. through a connection or by placing it in a vacuum chamber. The tracer gas is collected on the outside surface by a sampling probe, a carrier gas flow or by accumulation into a hood or chamber. Tracer gas can also be detected by chemical reactions.

A special technique (bombing) may also be used. This involves pressurization of a sealed object to force tracer gas into its internal cavities, if a leak exists. The object is then placed in a vacuum chamber and escaping tracer gas is detected (usually this procedure is used only with helium-4).

This method is applicable to specimens with small free internal volumes (in the order of a few cubic centimetres).

6 Apparatus — see EN 13625:2001

The test apparatus can include part or all of the following:

- 6.1 Leak detector or chemical reagents able to detect the selected tracer gas.
- 6.2 Calibrated leaks, calibrated for discharge into vacuum and/or against atmospheric pressure; refer to ISO/DIS 20486.
- 6.3 Pressure and temperature gauges.
- 6.4 Tracer gas or certified gas mixture.
- 6.5 Auxiliary vacuum systems.
- 6.6 Hood, vacuum or pressurizing chamber, jet or sampling probe.
- 6.7 Purging dry gas, liquid nitrogen (for cold trap), if necessary.
- 6.8 Equipment for tracer gas treatment-recovery.
- 6.9 Equipment for test area ventilation.
- 6.10 Data recording equipment.