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Non-destructive testing — Leak test — Guide to the selection of instrumentation for the measurement of gas leakage

The European Standard EN 13625:2001 has the status of a
British Standard

ICS 19.100

National foreword

This British Standard is the official English language version of EN 13625:2001.

The UK participation in its preparation was entrusted to Technical Committee WEE/46, Non-destructive testing, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 05 March 2002

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 138 "Non-destructive testing", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies criteria for the selection of equipment for the leak detection methods described in EN 1779. The minimum requirements for the performance of the instruments used are also given as a guideline for personnel involved in testing. The definite selection of an instrument for a given test is within the responsibility of a qualified operator (at minimum level 2 qualification – see EN 473).

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1330-8, *Non-destructive testing – Terminology – Part 8: Terms used in leak tightness testing*.

EN 1779:1999, *Non-destructive testing – Leak testing – Criteria for method and technique selection*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1330-8 apply.

In this document the methods and techniques are referred to the annex A of the EN 1779:1999.

4 Tracer gas method - Group A techniques (gas flowing into object)

4.1 Equipment and Material required for all group A techniques

4.1.1 Leak detector

In this type of test, a leak detector (LD) of the mass spectrometer type (MSLD) according to the minimum requirements of Table 1 is used.

4.1.2 Calibration leaks

At least one calibration leak for discharge to vacuum or against atmospheric pressure shall be used. These are used for the direct calibration of the MSLD (if a built-in calibration leak does not exist) or for system calibration (response time, sensitivity). If required, standard leaks shall be used. See Table 2.

4.1.3 Auxiliary pumping system

An auxiliary pumping system should be used if:

- the object volume or desorption gas load are too large for the built-in pumps of the MSLD;
- the leakage rate to be measured is too large for the measurement range of the MSLD.

The auxiliary vacuum pumping system shall comply with the minimum requirements of Table 4.

4.1.4 Connections

Pipes and valves of suitable conductance with a port for vacuum pressure measurement, previously tested for tightness so that they can not influence the test results, are required for:

- connection of the object to the MSLD;
- connection of the calibration leak to the system;
- connection of the object to the auxiliary pumping system (if necessary).

There should be a device for discharging the tracer gas outside the test area.

4.1.5 Tracer gas

Pure tracer gas or a known and homogeneous mixture containing tracer gas shall be supplied to ensure repeatability.

4.1.6 Test condition measurements

Calibrated pressure gauges and thermometers are required to monitor the object conditions. If required, ambient condition (pressure, temperature and humidity) shall also be measured. Response time shall be measured.

4.1.7 Cleaning and drying material and equipment

Solvents or degreasing agents shall be available to clean the surfaces to be tested. Drying is important to eliminate vapours that can increase the evacuation time or can interfere with tracer gas detection.

4.2 Vacuum technique

4.2.1 Vacuum technique total (A.1)

4.2.1.1 Hood or rigid chamber

The hood can be fabricated from a plastic film that is able to enclose entirely the object. It should be leak-tight enough to keep the tracer gas concentration constant.

The rigid chamber shall be leaktight and enclose the object entirely. It should allow easy handling of the test object. It shall be evacuable to purge the internal volume. Suitable crossing in the walls shall allow the connections. The chamber pressure shall be measured.

NOTE The enclosure should present a leakage rate 10 times less than the maximum allowed rate specified.

4.2.1.2 Time measurement

If the test is performed using an accumulation technique, the time from the initial tracer gas application shall be measured.

4.2.2 Vacuum technique partial (A.2)

4.2.2.1 Cups or partial hoods

Parts of the outer surface of the object are covered to admit selectively the tracer gas to the areas under test. Cups shall have soft edges or gaskets to adhere as much as possible to the surface.

The plastic hoods shall be sealed, for example with adhesive tape. It should be leak-tight enough to keep the tracer gas concentration constant.