BRITISH STANDARD

BS EN
12155:2000

Curtain walling — Watertightness — Laboratory test under static pressure

The European Standard EN 12155:2000 has the status of a British Standard

ICS 91.060.10

National foreword

This British Standard is the official English language version of EN 12155:2000.

The UK participation in its preparation was entrusted by Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, to Subcommittee B/538/6, Curtain walling, 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.

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

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 12, an inside back cover and a back cover.

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English version

Curtain walling - Watertightness - Laboratory test under static pressure

Façades rideaux - Détermination de l'étanchéité à l'eau - Essai de laboratoire sous pression statique

Vorhangfassaden - Schlagregendichtheit - Laborprüfung unter Aufbringung von statischem Druck

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 12155:2000 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 33, Doors, windows, shutters, building hardware and curtain walling, 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of an identical text or by endorsement, at the latest by December 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

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.

This European Standard is part of a series of European Standards dedicated to curtain walling products.

This European Standard also forms part of a series of curtain walling performance requirements as defined in the product standard prEN 13830:2000.

1 Scope

This standard defines the method for determining the watertightness of curtain walling, both its fixed and openable parts.

It describes how the outside face of the specimen should be subjected to a continuous film of water with a positive static air pressure.

NOTE This standard applies to curtain walling in accordance with prEN 13830:2000.

2 Normative references

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

EN 12154:1999	Curtain walling - Watertightness - Performance requirements and classification.
prEN 13119:1997	Curtain walling - Terminology.

3 Definitions

For the purposes of this standard, the definitions given in prEN 13119:1997, together with the following, apply.

3.1
test pressure
differential pressure between the two faces of the test specimen, expressed in Pascals (Pa)

3.2
positive pressure
when the outer face is subjected to higher pressure than inner face

3.3
watertightness
ability of the curtain walling to resist water leakage

3.4
water leakage
penetration of water that would continuously or repeatedly wet parts of:

- the inside face of the test specimen;

- any parts of the specimen intended to remain dry, not being part of the water drainage system to the outside;

3.5
limit of watertightness
maximum test pressure for which the specimen remains watertight for the specified time (see Table 1, EN 12154:1999)

4 Principle

Application of a constant and specified quantity of water in a continuous film over the outside surface of the specimen with increments of positive static test pressures applied at set time intervals. The test operator shall note when and where any water leakage has occurred.

5 Apparatus

5.1 A chamber with an opening into which the test specimen can be fitted. This chamber shall be of sufficient strength and rigidity to withstand the test pressures likely to be imposed during the tests. It shall not deflect under test pressure to any extent which would affect the performance of the test specimen (Figure 1).

Adequately representative structural supports shall be provided to which the specimen shall be attached in accordance with the conditions of use in the works (see also clause 6).

The chamber shall be constructed so that the air permeability through it, at pressures up to the maximum test pressure, does not exceed the permissible air permeability through the specimen at the same pressure.

5.2 A means for applying controlled positive test pressures to the test specimen.

5.3 A means by which rapidly controlled changes of positive test pressures may be produced within defined limits.

5.4 A means of measuring the positive test pressure, steady or fluctuating, calibrated within an accuracy of ±5 %.

5.5 An adjustable device for spraying water at 2 $l/m^2 \cdot min$ so that a constant and continuous film is applied to the outside surface of the specimen.

The water spraying device shall have nozzles spaced on a regular grid and at a uniform distance from the outside surface of the specimen (Figure 2 and Figure 3).

The local mains water supply will be an acceptable source providing it is clean enough to allow the spray nozzles to function properly throughout the test.

The nozzles shall include the following features:

- circular full cone spray;

- spray angle minimum 90° to maximum 120°;

- working pressure range 2 to 3 bars according to the manufacturer's specification.

5.6 A means of measuring the total amount of water supplied within an accuracy of 10 %.

5.7 A drain for the sprayed water which will not interfere with the drainage of the specimen frame.

6 Test specimen

The specimen shall be submitted in a fully operable condition, ready for use. It shall be supplied in a suitable manner for fixing onto a test chamber. The test specimen shall not be less than two typical units wide and shall be sufficient to provide full loading on at least one typical vertical joint or framing member or both. The specimen shall not obtain additional stiffness from the test chamber. The height shall not be less than the full distance between the curtain wall's point of connection to the building structure.

For custom designed curtain walls or special elements, the specimen shall be a size which is adequate to demonstrate its compliance with the specified requirements.

All parts of the specimen shall be full size, using the same materials, details, methods of construction and fixing as intended for use in the works. Conditions for connection to the structural support shall simulate those in the works as accurately as possible (see also 5.1).

This standard does not apply to the perimeter joints between the curtain walling and the test chamber, or to the joints between the curtain walling and the building construction.

7 Test preparation

As this test follows that for air permeability, then no further preparatory actions are required.

NOTE The sequence of tests as specified in prEN 13830:2000 should be followed.

8 Test procedure

Select the maximum test pressure (P_{max}) for classification according to EN 12154:1999.

Apply 3 pulses of positive pressure equal to 500 Pa or 10 % greater than the maximum test pressure (P_{max}) whichever is greater. The maximum pressure for each pulse should be reached in not less than 1 s and it should be maintained for not less than 3 s.

Operate the water sprays with 0 Pa test pressure and adjust the total flow to provide 2 l/m^2·m calculated from the area of the specimen under test.

After 15 minutes of spraying, apply test pressure in the appropriate sequence specified in EN 12154:1999, Table 1, up to the selected maximum test pressure (P_{max}).

Constantly inspect the inside surfaces of the specimen for water leakage throughout the spraying period and record the test pressure, time and location of any leaks that are observed (Figure 4).

9 Results

If water leakage is observed before the required maximum test pressure (P_{max}) has been applied for the specified time, record the test pressure and time for which it has been applied, when the leak is first observed.
Location of leaks (with identifying numbers, if there are more than one) shall be marked on an elevational scaled drawing of the specimen.

10 Test report

Prepare a report to positively identify the specimen/s and record all parameters checked.

The report shall include the following details:

- reference to this standard;
- name of the testing institute;
- persons or persons requesting the test;
- details of test specimen/s as follows:
    - type/s of construction;
    - profile references ;
    - origin of materials;
    - type/s of materials;
    - date/s of manufacture, (if known);
- dimensioned drawings of specimen/s;
- the results of the test;
- product designation from manufacturer’s literature;
- observations as to the condition of the specimen/s;
- date of test;
- date of calibration of test chamber and equipment;
- date of report;
- signature of person preparing the report.

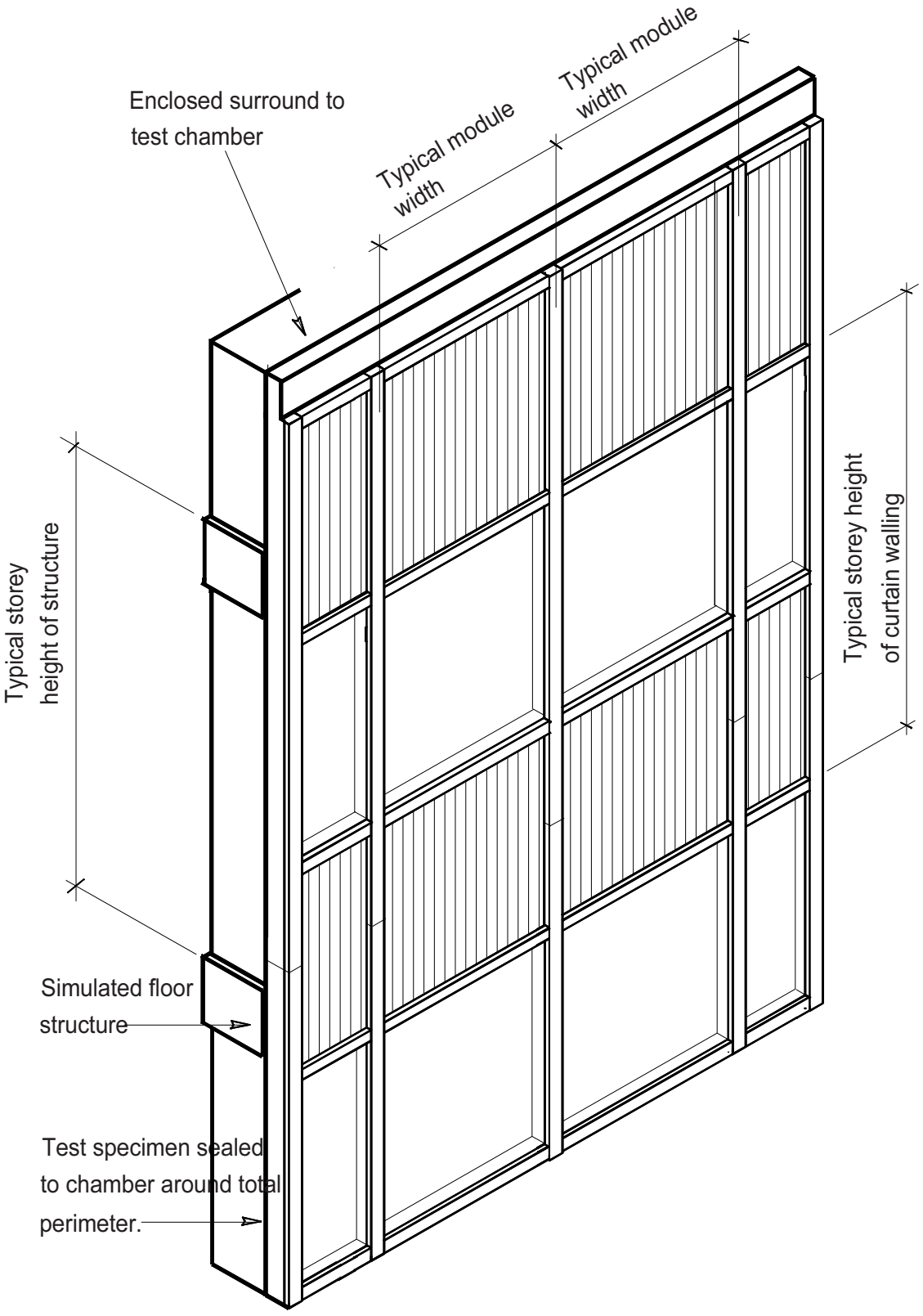
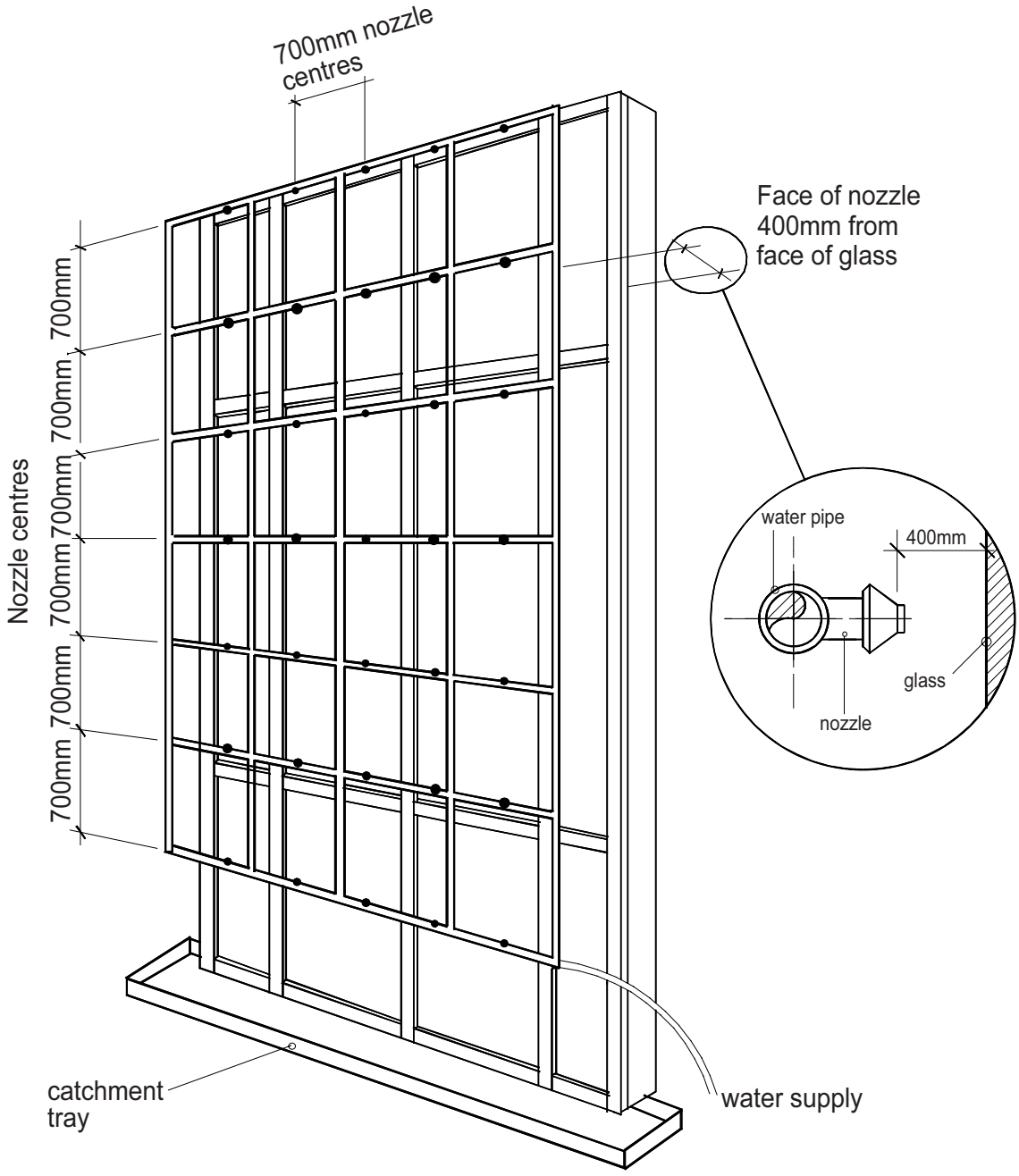
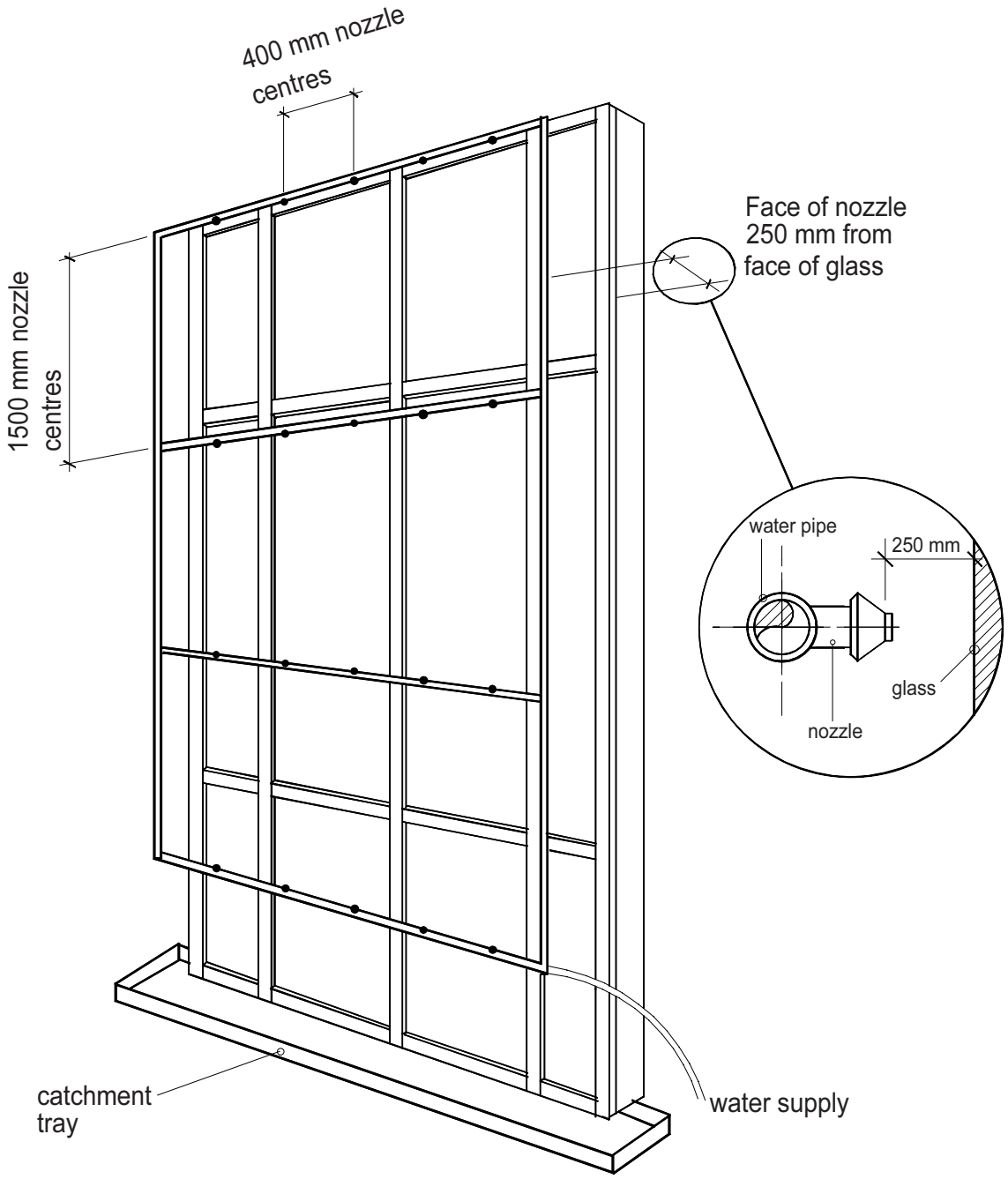


Figure 1 - Example of test specimen built onto test chamber



Note The arrangement of the grid of spray nozzles over the test area of the specimen is not critical. Alternative arrangements from that shown in this figure can be used. It should however provide an approximately continuous film of water over the specimen surface.

Figure 2 - Example of water spray system



Note The arrangement of the grid of spray nozzles over the test area of the specimen is not critical. Alternative arrangements from that shown in this figure can be used. It should however provide an approximately continuous film of water over the specimen surface.

Figure 3 - Further example of water spray system

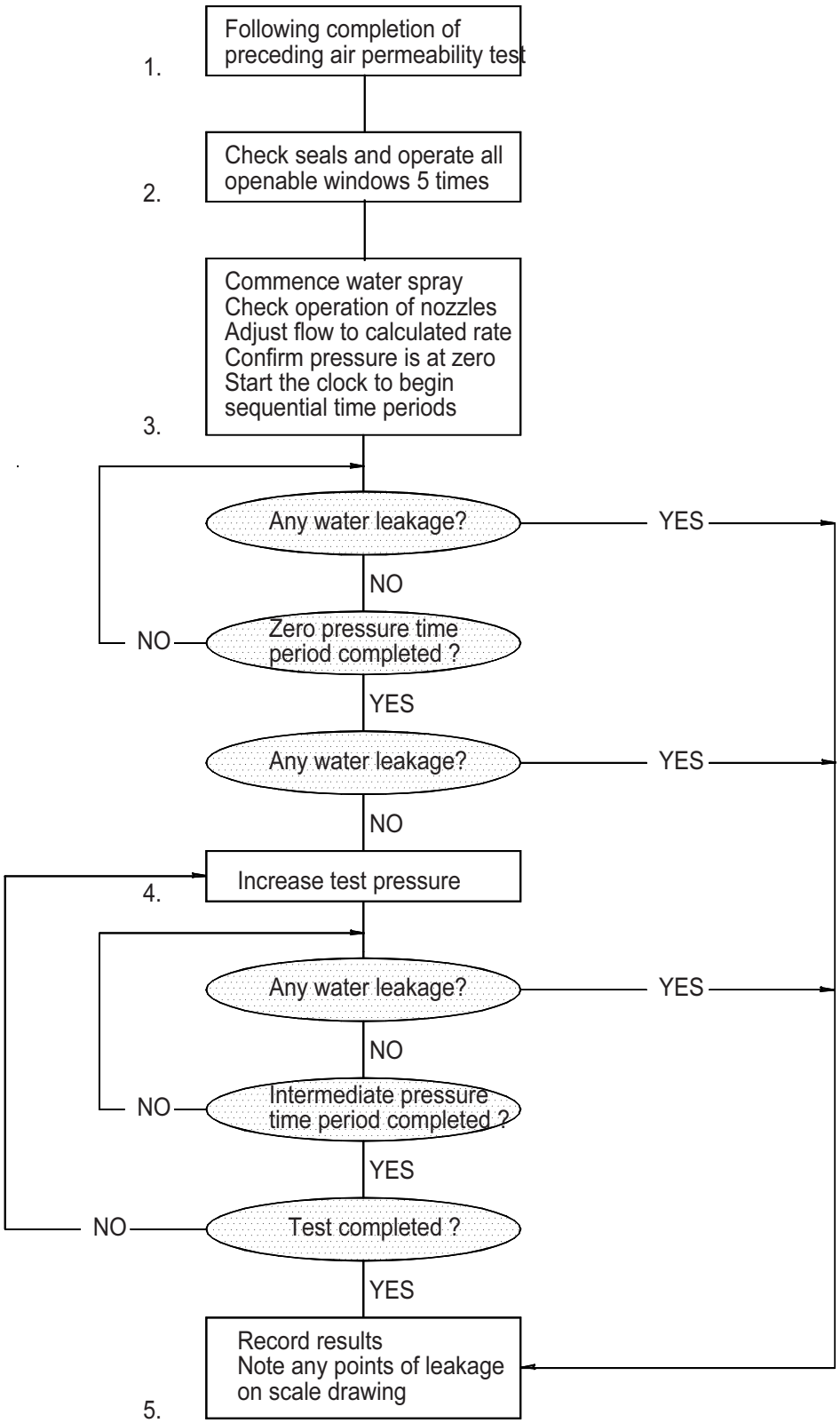


Figure 4 - Flow chart of test procedure

Bibliography

EN 1027:1999	Windows and doors - Watertightness - Test method.
EN 12208:1999	Windows and doors - Watertightness - Performance requirements and classification.
prEN 13830:2000	Curtain walling - Product standard.

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