BRITISH STANDARD

BS EN
12179:2000

Curtain walling — Resistance to wind load — Test method

The European Standard EN 12179:2000 has the status of a British Standard

ICS 91.060.10

National foreword

This British Standard is the official English language version of EN 12179:2000.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 9 and a back cover.

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This British Standard, having been prepared under the direction of the Sector Committee for Building and Civil Engineering, was published under the authority of the Standards Committee and comes into effect on 15 August 2000

ISBN 0 580 35787 2

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12179

June 2000

ICS 91.060.10

English version

Curtain walling - Resistance to wind load - Test method

Façades rideaux - Résistance à la pression du vent - Méthode d'essai

Vorhangfassaden - Widerstand gegen Windlast - Prüfverfahren

This European Standard was approved by CEN on 6 October 1999.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. EN 12179:2000 E

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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of an identical text or by endorsement, at the latest by December 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.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 forms part of a series of curtain walling tests as defined in the product standard prEN 13830:2000.

1 Scope

This standard defines the method for determining the resistance to wind load of curtain walling, both its fixed and openable parts, under postive and negative static air pressure.

NOTE This standard applies to any curtain walling product as defined in 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.

prEN 13119: 1997 Curtain walling - Terminology.

prEN 13116: 1997 Curtain walling – Resistance to wind load – Performance requirements.

ENV 1991-2-4 Eurocode 1: Basis of design and actions on structures - Part 2-4: Actions on structures - Wind actions.

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 Pascal (Pa)

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

3.3
negative pressure
when inner face is subjected to higher pressure than outer face

3.4
design wind load
load calculated following the procedure specified within ENV 1991-2-4 and represented in this test with positive and negative test pressures on the test specimen

3.5
increased load
(safety load) 1,5 times design wind load expressed in Pascal

3.6
residual deformation
change in shape or dimension which does not disappear when the test pressure is removed

3.7
frontal displacement
movement of a point on a member measured normal to the member

3.8
frontal deflection
maximum frontal displacement of a member, minus half the sum of the frontal displacement at each end of the member

4 Principle

Application of a sequence of test pressures (positive and negative) with displacements measured at each pressure.

5 Apparatus

The test apparatus shall include the following.

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).

Adequate 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 so constructed that the air permeability through it, at pressures up to the maximum air permeability test pressures, does not exceed the permissible air permeability through the specimen, at the same pressures.

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

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

5.4 A means of measuring the applied positive and negative test pressures, steady or fluctuating, within an accuracy of ±5 %.

5.5 Devices for measuring displacements to an accuracy of at least ±0,1mm.

5.6 A means of positioning the devices for measuring frontal displacements of specimen members.

5.7 A means of recording the displacements throughout the duration of the test.

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

Install devices for measuring the maximum frontal displacements of appropriate curtain walling members so that performance can be assessed in accordance with prEN 13116:1997.

Identify each displacement measuring device and its location on a suitable drawing of the test specimen.

No further preparations are necessary other than those already carried out for the preceeding air permeability and watertightness tests.

8 Test procedure

Where openable parts exist in a curtain wall test specimen, then open, close and lock each openable part of the test unit five times prior to testing.

Test the resistance to wind load with positive test pressure, followed by the test with negative test pressure.

8.1 Positive pressure test

Apply three pulses of air pressure at 50 % of design wind load or 500 Pa, whichever is greater. The short period for pressure increase shall be not less than 1 s. Sustain each pulse for at least 3 s.

Reset all measuring devices to zero or to their initial readings and record these.

Note any changes in the condition of the specimen.

Subject the curtain wall unit to the test pressures in 4 stages, for a minimum period of 15 s ± 5 s at each stage up to design wind load, i.e. 25 %, 50 %, 75 % and 100 % of design wind load.

Measure the frontal displacements at each test pressure and determine frontal deflections as required in prEN 13116:1997.

Record residual deformations no later than 1 hour after completion of the test.

8.2 Negative pressure test

Apply the same procedure as specified in 8.1 with negative test pressures.

8.3 Increased load test (optional)

Positive pressure test - When required, apply a positive test pressure of 150 % of the design wind load as specified in prEN 13116:1997 for a minimum period of 15 s ± 5 s.

Note any changes in the condition of the specimen.

Open and close all openable windows 5 times, finally securing them in the closed position.

9 Results

9.1 List the measurements of frontal displacements for each test pressure, calculate the frontal deflections and express them graphically as functions of test pressure.

Record the residual deformations.

Note any damage on an elevation drawing of the specimen.

Compare the frontal deflections and any residual deformations with the maximum permissable values specified in prEN 13116:1997 and assess as passed or failed.

9.2 List the results for the increased load tests in an annex to the report, including any damage conditions.

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);

- dimensional drawing 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.

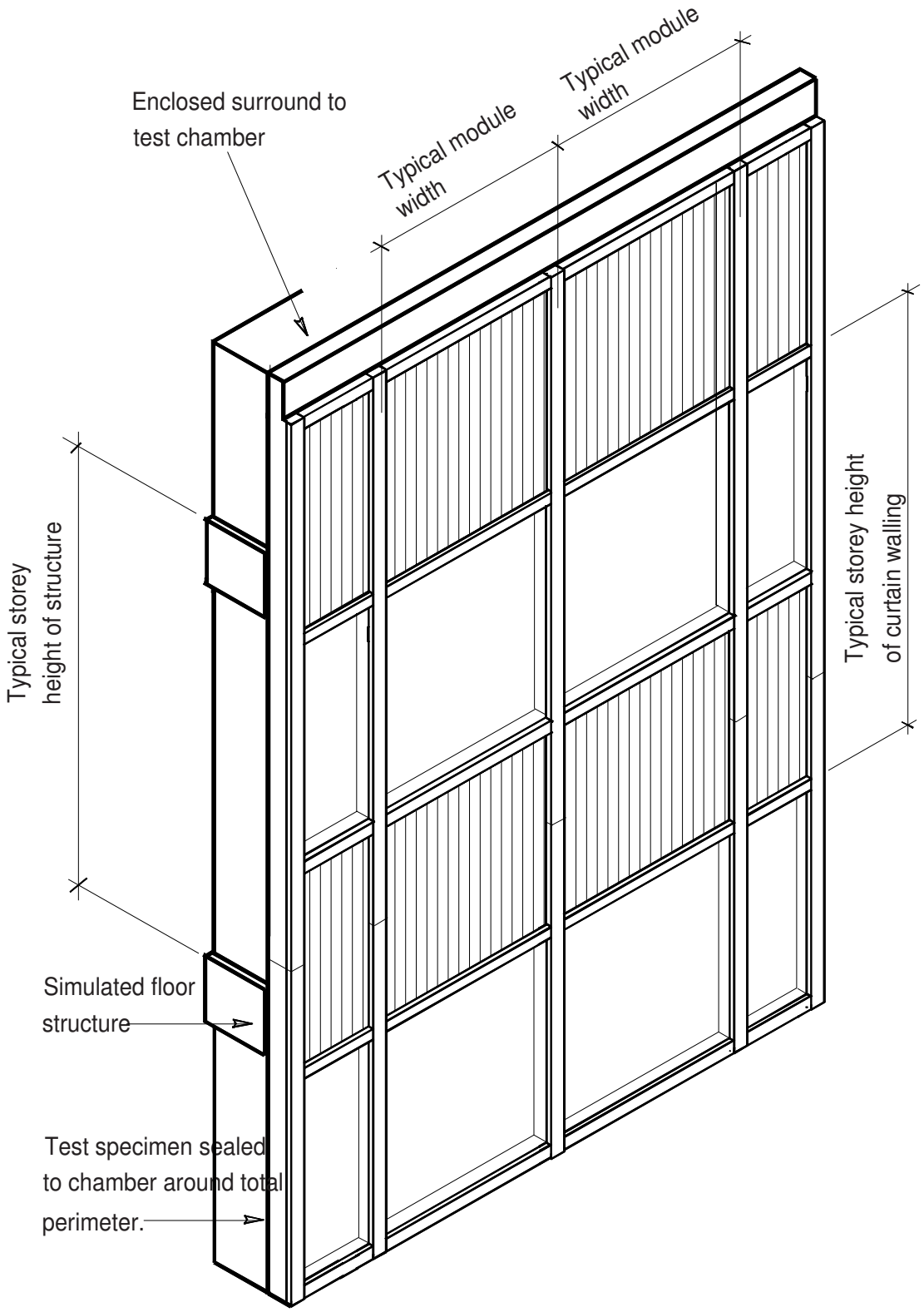

Figure 1 - Example of test specimen built onto test chamber

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