BRITISH STANDARD

BS EN
12489:2000

Industrial, commercial and garage doors and gates — Resistance to water penetration — Test method

The European Standard EN 12489:2000 has the status of a British Standard

ICS 91.060.50

National foreword

This British Standard is the official English language version of EN 12489:2000.

The UK participation in its preparation was entrusted by Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, to Subcommittee B/538/5, Industrial, commerical and garage doors and gates, 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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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 October 2000

ISBN 0 580 36535 2

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12489

July 2000

ICS 91.060.50

English version

Industrial, commercial and garage doors and gates - Resistance to water penetration - Test method

Portes équipant les locaux industriels, commerciaux et les garages - Résistance à la pénétration de l'eau - Méthode d'essai

Tore - Widerstand gegen eindringendes Wasser - Prüfverfahren

This European Standard was approved by CEN on 19 July 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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

Ref. No. EN 12489:2000 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 January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

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.

No existing EN standard is superseded.

This standard is one of a series of performance standards identified within the product standard prEN 13 421:1998.

European Standards as well as relevant national regulations and standards will enable the actual exposure levels to be determined for the individual locations of the products.

Annex A is normative. Annex B is informative.

1 Scope

1.1 General

This European Standard specifies the test method for determining the resistance to water penetration for doors in a closed position.

The doors are intended for installation in areas in the reach of people, for which the main intended uses are giving safe access for goods, vehicles and persons in industrial, commercial or residential premises.

The doors may be manually or power operated.

This document applies to all doors provided in accordance with prEN 13 241:1998.

1.2 Exclusions

It does not apply to:
- lock gates and dock gates;
- doors on lifts;
- doors on vehicles;
- armoured doors;
- doors mainly for the retention of animals;
- theatre textile curtains;
- horizontally moving doors less than 2,5 m wide and 6,25 m^2 area, designed principally for pedestrian use;
- revolving doors of any size;
- doors outside the reach of people (such as crane gantry fences);
- railway barriers;
- barriers used solely for vehicles.

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.

EN 12 433-1	Industrial, commercial and garage doors and gates - Terminology - Part 1: Types of doors
EN 12 433-2	Industrial, commercial and garage doors and gates - Terminology - Part 2: Parts of doors
EN 12 425	Industrial, commercial and garage doors and gates - Resistance to water penetration - Classification
prEN 13 241:1998	Industrial, commercial and garage doors and gates - Product standard

3 Terms and definitions

For the purpose of this standard the terms and definitions in EN 12 433-1 and EN 12 433-2 apply. In addition the following definitions also apply:

3.1 Resistance to water penetration: ability of the test specimen, when in closed position, to resist water penetration under specified test conditions.

3.2 Water penetration: continuous or repeated wetting of the internal surface of the test specimen or parts which are not designed to be wetted.

4 Principle of test

Constant spraying of a specified quantity of water onto the external surface of the test specimen while increments of positive test pressure are applied at regular intervals. Details shall be recorded for test pressure and location of water penetration.

5 Apparatus

The basic test apparatus shall include:

a) an opening to which the test specimen can be fitted, to simulate the structure of the product on site.

b) device(s) to provide controlled air pressure, above atmospheric air pressure, to the exposed surface of the specimen, enabling rapid changes of air pressure, controlled between defined limits.

c) device(s) to measure the amount of supplied water to an accuracy of ±10 %. If several rows of nozzles with different flows are set up, at least two are necessary.

d) device(s) for measuring air pressure with an accuracy of ± 5 %.

e) a spraying system capable of applying a continuous regularly dispersed film of water all over the surface likely to be wetted in real exposure conditions by means of full circular nozzles according to figure 1 and with the following features:

- angle of spray: $120° \, ^{+0°}_{-10°}$
- air pressure working range: 2 bar to 3 bar according to manufacturers specifications
- nozzle rate: top row 2 ± 0,2 l / min / nozzle
  additional rows 1 ± 0,1 l / min / nozzle

- water characteristics	- its temperature shall be between 4° C and 30° C. - it shall be clean enough to enable the nozzles to spray properly. - any locally supplied water will be acceptable.

f) a system able to drain the sprayed water away from the surround, without interfering with the self drainage of the door itself.

NOTE The test rig should not be designed to increase the performance of the specimen.

The test rig shall be prepared so that it is able to withstand the pressures applied during the test, without deflecting to an extent likely to impair jointing or to impose bending stresses.

The test rig shall be prepared and installed so that any water leakage, including that through the frame joints shall be readily detectable.

6 Preparation of test specimen

a) The test specimen shall be installed in accordance with the manufacturer's standard or published installation instructions.

b) The test specimen shall consist of parts which in detail conform to the production level of quality. Whenever possible the test specimen should be newly made. Doors and parts in stock are to be regarded as newly made if they fully comply with the specification of the running production.

c) The test specimen shall be clean and the surfaces dry.

d) Any ventilation, drainage or "weep holes" shall be taped up or left open according to the purpose of test and this purpose and state shall be noted and recorded. In most cases, air can pass through both fixed or opening joints.

e) The application of the test specimen in its normal use as indicated in the manufacturer's standard or published installation instructions shall be taken into account when determining the position of the water spraying system.

f) Minimum dimensions of specimen, see table 1.

Table 1 - Minimum dimensions of specimen

Commercial and garage doors	Width: 2 000 mm Height: 2 000 mm
Industrial doors	Width: 3 500 mm Height: 3 000 mm

g) The help of an adequate template is recommended to achieve the set-up of the spraying system according to Figure 1:

for an overall door height up to 2000 mm

- a single row adjusted so that each nozzle sprays on average 2 l/min ± 0,2 l/min

for an overall door height more than 2000 mm

- an upper row adjusted so that each nozzle sprays on average 2 l/min ± 0,2 l/min and
- one or more additional rows equally divided between the bottom of the specimen and the upper row of nozzles, with a tolerance of ± 150 mm. According to the table 2 below the flow of each nozzle should be an average 1 l/min ± 0,1 l/min.

Table 2 - Number of nozzle rows

Overall door height (daylight height) mm	Number of nozzle rows (upper row included)	Distance between nozzle rows (equally divided) mm
< 2000	1	
≥ 2000 to < 3000	2	1000 – 1500
≥ 3000 to < 4500	3	1000 – 1500
≥ 4500 to < 6000	4	1120 – 1500

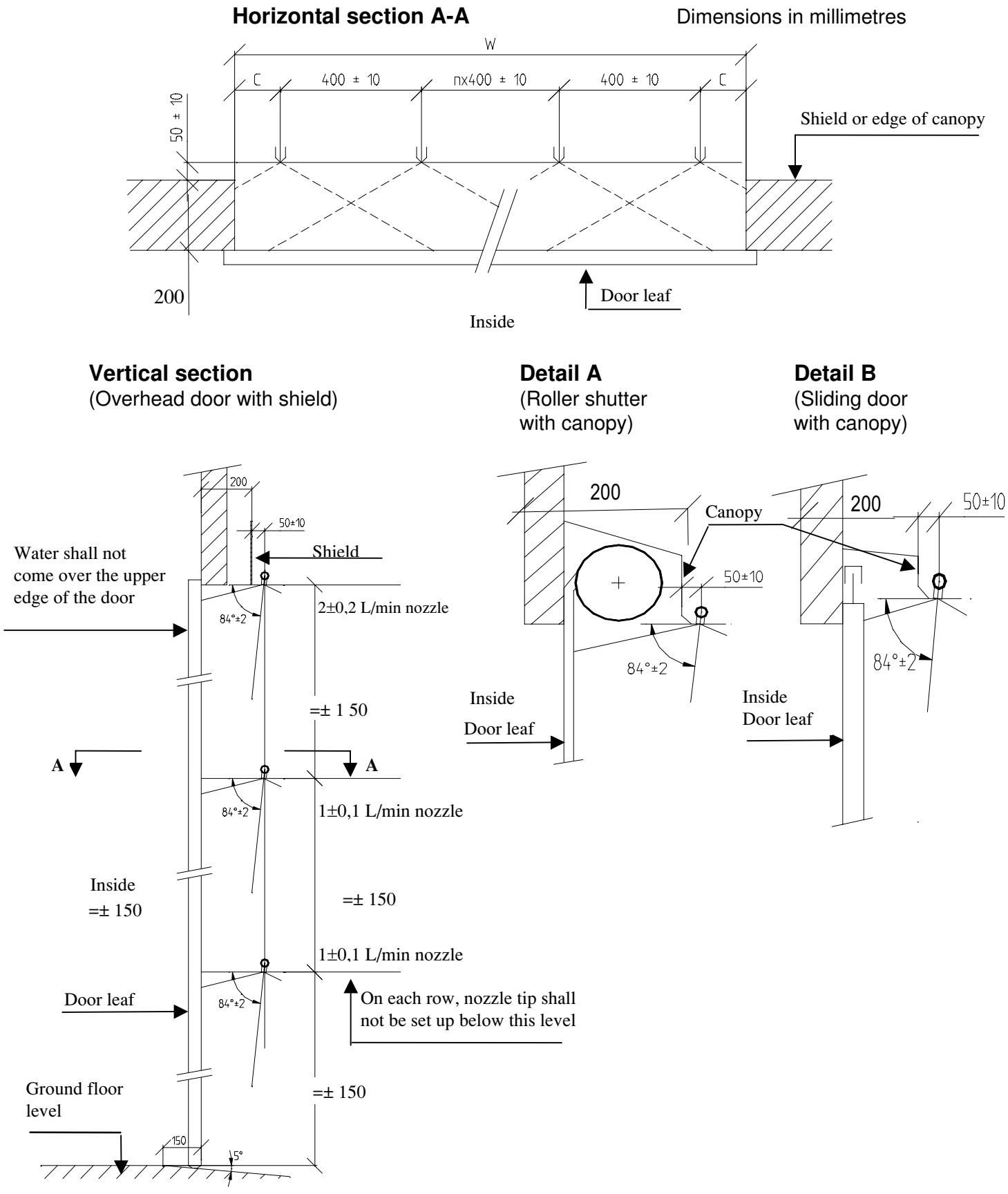


Figure 1 - Set-up spraying system for different doortypes and details with canopys

7 Test procedure

7.1 Preliminaries

The test specimen shall be conditioned for at least 4 houres within the range 10°C to 30°C and 25% to 75% relative humidity immediately before testing.

Temperature shall be measured to within ± 3°C and humidity to within ± 5%. Atmospheric pressure shall be measured to within ± 1 kPa.

The test specimen shall be opened and closed at least once before finally being secured in the closed positions.

If air permeability has not been performed during the previous 24 h, three air pressure pulses shall be applied, the duration of increase in air pressure shall not be less than one second. Each pulse shall be maintained for at least three seconds see Annex A. These pulses shall produce a air pressure 10% greater than the required maximum air pressure.

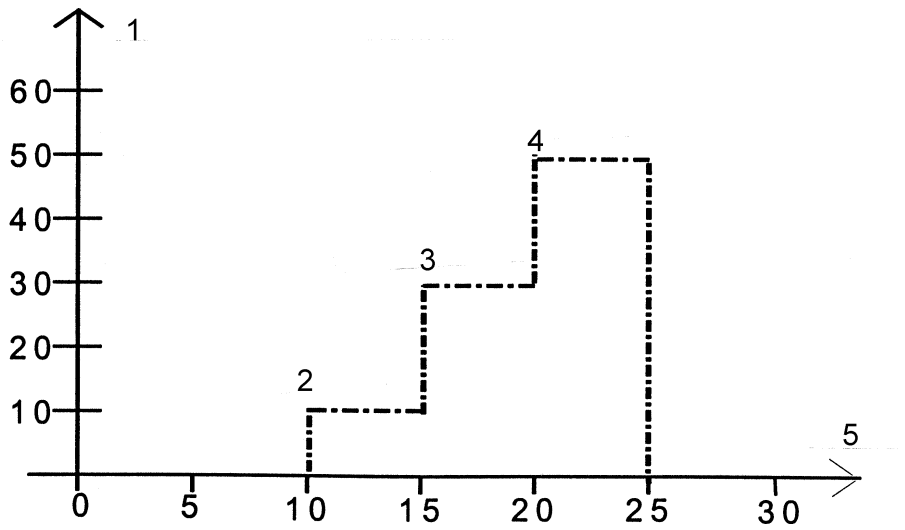
7.2 Spraying phase

Constant spraying of a specified quantity of water to the outside surface of the test specimen whilst static air pressure, in a sequence of increasing amplitude steps, is applied.

Spraying is applied first 10 min without air pressure and then with constant air pressure increasing every 5 minutes. Overall duration is performance dependent. Hence the minimum test lasts at least 15 min.

Testing shall be carried out as follows:

- the flow of each row is adjusted according to the specifications of 5 f) and figure 1
- air pressure application: each step lasts 5 min, they are given in figure 2;
- the test operator shall continuously monitor the test air pressure within practical limits.



Key

1 Air pressure in Pa
2 Step 1
3 Step 2
4 Step 3
5 Time in min

Figure 2 - Air pressure steps

The test is finished when the required air pressure steps and all the previous requirements have been carried out, or the failure criteria occurs.

8 Failure criteria

Failure during the test shall be deemed to occur when continuous or repeated penetration of water wets the internal surface of the door leaf with the exception of a 100 mm strip of the internal surface measured from the vertical edges of the door leaf. However it is accepted that water wets parts where by design the water drains back to the external face, so that the test specimen or parts that are intended to remain dry.

9 Test report

The test report shall contain as a minimum the following information:

a) date;

b) reference to this standard;

c) name of the approved laboratory, if applicable;

d) all necessary references to identify the specimen;

e) all relevant details concerning the dimensions of the specimen, its materials, design, construction and manufacture and its finished surface and fittings and also its method of delivery;

f) drawings of details of the specimen shall be of a suitable scale;

g) drawing and description of the test equipment;

h) test method;

i) test procedures, including storage and conditioning prior to test, and mounting the specimen ready for test;

j) test climates used;

k) report the location of water penetration, if any;

l) mark these data on an elevation drawing of the test specimen;

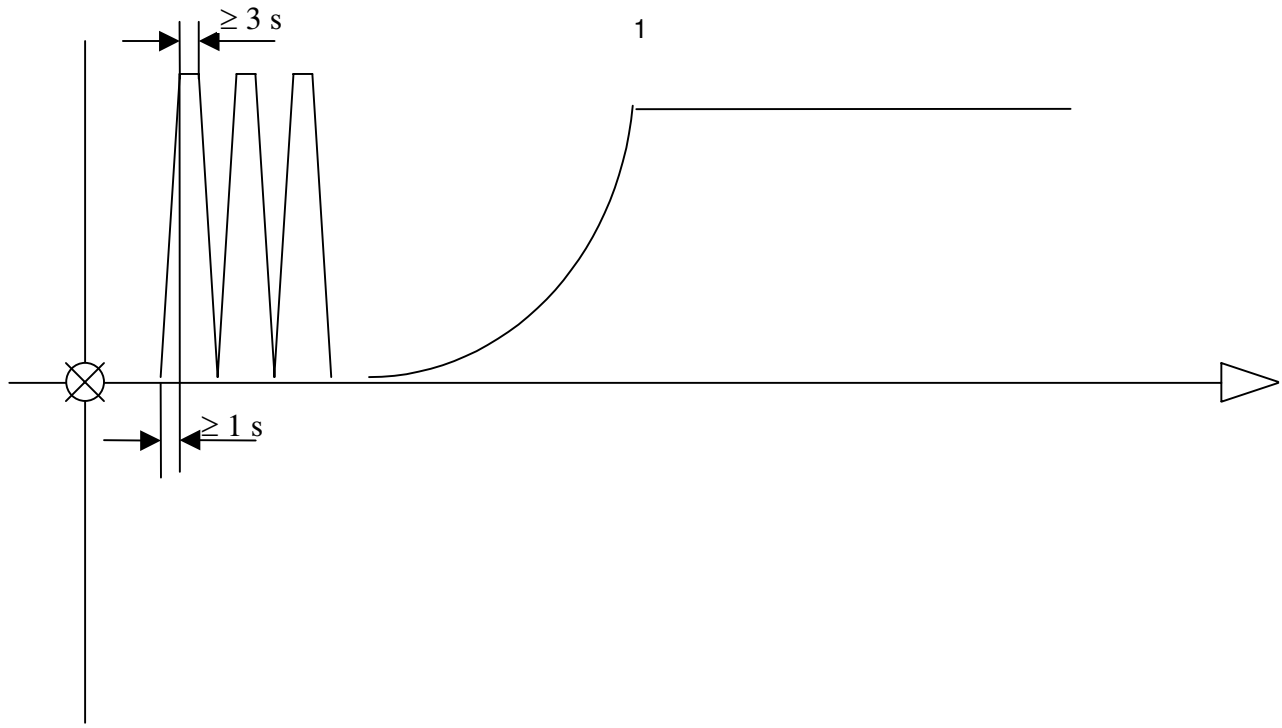
m) summary with observations;

n) signature of the responsible person.

Annex B shows an example of a test report.

Annex A (normative)

Air pressure sequence for test rig



Key

⊗ Opening and closing operation

1 Stabilized pressure

Annex B (informative)

Test report for water resistance according to EN 12 489:2000

Date:..... Approved laboratory:.....

Test room and air conditions

Temperature	**°C**	**Relative humidity**	**%**
Atmospheric air pressure	**hPa**	**Water temperature**	**°C**

Test identification:

Over all door size: height mm Reference test specimen drawings
width mm .....
Reference to test rig .....

SPRAYING CONDITIONS: .....

Number of Nozzle	**1 l/nozzle**	**2 l/nozzle**
Top row	--------	
Additional row 1		--------
Additional row 2		--------
Additional row 3		--------
Additional row 4		--------

OBSERVATIONS OF THE DEGREE OF WATER LEAKAGE ON THE INSIDE OF THE SPECIMEN 1)

Air Pressure Pa	**Time min**	**Frame**	**Joints**	**Glass**	**Filling**	**Opening**	**Others (Corners)**
0	10						
10	+5 (15)						
30	+5 (20)						
50	+5 (25)						

1) Degree of water leakage

0: No leak
1: 1 clinging drop
2: 2 or more falling or clinging drops
3: Runs
4: Considerable flow

LOCATION OF WATER LEAKAGE

Representative view of the specimen

blank

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