



National Standards Authority of Ireland

IRISH STANDARD

I.S. 514 : 1981

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**METHODS OF TESTING WINDOWS : WIND  
RESISTANCE TESTS.**

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Údarás um Chaighdeáin Náisiúnta na hÉireann



**IRISH STANDARD SPECIFICATION**

**METHODS OF TESTING WINDOWS  
WIND RESISTANCE TESTS**

I.S. 514 : 1981

(EN 77 : 1977)

*Price £2.40*

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## DECLARATION

OF

SPECIFICATION

ENTITLED

METHODS OF TESTING WINDOWS

WIND RESISTANCE TESTS

AS

THE IRISH STANDARD SPECIFICATION FOR

METHODS OF TESTING WINDOWS

WIND RESISTANCE TESTS

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The Institute for Industrial Research and Standards in exercise of the power conferred by section 20 of the Industrial Research and Standards Act, 1961 (No. 20 of 1961), and with the consent of the Minister for Industry and Energy, hereby declares as follows:

1. This instrument may be cited as the Standard Specification (Methods of Testing Windows – Wind Resistance Tests) Declaration, 1981.

2. (1) The Specification set forth in the Schedule to this declaration is hereby declared to be the standard specification for Methods of Testing Windows – Wind Resistance Tests.

(2) The said standard specification may be cited as Irish Standard 514:1981 (EN 77:1977) or as I.S. 514:1981 (EN 77:1977).

## SCHEDULE

# Methods of Testing Windows Wind Resistance Tests

### 1. INTRODUCTION

Wind effects on windows are transmitted, among others, by positive and negative pressures that are conventionally simulated by the following tests.

These tests allow for the checking that under those effects, the complete window:

- has an admissible deformation,
- maintains its characteristics,
- does not endanger users.

### 2. SCOPE

This standard defines the method of test to be used for assessing resistance under positive and negative pressure of windows to be fitted in exterior walls and supplied in the form of finished units in actual operating conditions.

### 3. FIELD OF APPLICATION

This standard applies to all windows, including door height windows, made of any material, in the actual operating condition in which they should be used and fixed according to the manufacturer's recommendations in a finished building, bearing in mind the conditions of test as defined hereafter. The standard does not apply to the joints between the windows and surrounding components and materials.

### 4. TERMINOLOGY

**4.1 Permanent residual deformation.** Change in shape or dimension which does not disappear when pressures are no longer applied.

**4.2 Temporary residual deformation.** Change in shape or dimension which disappears progressively when pressures are no longer applied.

**4.3 Frontal displacement.** Displacement of a point on a window member measured normal to the plane of the window.

**4.4 Frontal deflection.** Maximum difference between the frontal displacements taken along the same window member (after compensation of the effects of frontal displacements of the ends of this member).

**4.5 Relative frontal deflection.** Value of the frontal deflection in relation to the distance between the two ends of the window element under examination.

### 5. TESTS

They entail three distinct and successive tests:

- deformation test up to P1 in positive and/or negative pressure,
- repeated positive and/or negative pressure  $n$  times up to pressure P2,
- safety test under positive and/or negative pressure up to pressure P3.

These required values of P1, P2, P3 (positive and/or negative) and  $n$  shall be defined in other national standards.

## 6. APPARATUS

The basic test apparatus consists of the following:

- (1) A chamber with an opening to which the test window is fitted by its surround (see Clause 7).
- (2) A means of providing a controlled differential air pressure across the window.
- (3) A device for rapid controlled changes of the differential air pressure operating between defined limits.
- (4) A means of measuring the difference in pressure between the two faces of the window.
- (5) A device for measuring displacements.
- (6) A means to place the device for measuring frontal displacements and to ensure its stability during the test.

## 7. PREPARATION OF THE WINDOW FOR TESTING

A surround for the specimen to be tested shall be prepared. This surround shall be stiff enough to withstand the test pressures without deflecting to an extent likely to impair jointing or to impose bending stresses on the test specimen. When actual operating conditions are known, the fixing of the specimen may simulate these (e.g. a window in curtain walling).

The window shall be fixed plumb, square, and without twist or bends.

The thickness, type of glass and the method of glazing shall comply with the requirements of the manufacturer. In case of no specification or when there is a possibility that the window shall be used with different glasses, tests shall be carried out with a glass of minimum thickness with respect to the area, as specified in the national standards.

The hardware fitted to the test window shall be supplied or specified by the manufacturer.

## 8. PREPARATION FOR THE TESTS

The laboratory ambient air temperature and the test chamber air temperature shall be measured and recorded in the report.

Three air pressure pulses shall be applied; the rate of application shall be over a period of not less than 1 second, and the pressure shall be maintained over 3 seconds. These pulses shall be at the pressure required for the deformation test (P1), and shall not be less than 500 Pa.

With the pressure reduced to zero, all operating parts of the window shall be opened and closed 5 times and finally secured in the closed position.

If it is desired to examine the resistance of the window under positive and negative pressure, each of the three tests shall be carried out first under positive pressure then under negative pressure and a "preparation" (Clause 8, 2nd paragraph) shall be done before the measurement of the deformation under negative pressure.

## 9. METHODS OF TESTS

The window shall undergo the following sequence:

**9.1 Deformation test.** The device for measuring changes in position relative to the plane of the window is brought into its measuring position. The window shall be subjected to pressures which increase in stages, for a minimum period of 10 seconds at each stage, until the maximum pressure required (P1) for this test.

These pressures shall be 100, 200, 300, 400, 500 Pa and can then be increased up to P1 in stages of 250 Pa maximum.

At each pressure stage, changes in position relative to the plane of the window are measured at the characteristic points stated for the type of window to be tested.

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