



SLOVENSKI STANDARD
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Zunanja senčila in polkna - Odpornost proti obremenitvam z vetrom - Preskusna metoda in merila učinkovitosti

External blinds and shutters - Resistance to wind loads - Method of testing and performance criteria

Abschlüsse und Markisen - Widerstand gegen Windlast - Prüfverfahren und Nachweiskriterien

Fermetures pour baies équipées de fenêtres et stores extérieurs - Résistance aux charges de vent - Méthodes d'essai et critères de performance

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External blinds and shutters - Resistance to wind loads - Method of testing and performance criteria

Fermetures pour baies équipées de fenêtres et stores extérieurs - Résistance aux charges de vent - Méthodes d'essai et critères de performance

Abschlüsse und Markisen - Widerstand gegen Windlast - Prüfverfahren und Nachweiskriterien

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Foreword

This document (prEN 1932:2011) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 1932:2001.

This document is part of a package of standards dealing with external blinds and shutters fitted to buildings as defined in EN 12216.

The tests defined in this standard conventionally reproduce the positive and negative pressures due to the wind applied to external blinds and shutters

Under these conditions, these tests allows the verification that external blinds and shutters as a whole fulfil the requirements specified in FprEN 13561:2011 and prEN 13659:2011, namely:

- no unacceptable visual defects appears;
- the suitability for use is maintained;
- the safety of users is maintained.

The main changes incorporated in this revision are:

- A complete editorial review of the document has been carried out.
- Pergola awnings have been added in accordance with the modification of the scope of EN 13561.
- The possibility to apply a uniformly distributed load with a mattress has been added for some products (e.g. Awnings with lateral guiderail with fabric running into the lateral rails without tension system)
- The test method for External Venetian Blinds has been changed: the bar test has been replaced by a test with a pneumatic device.

1 Scope

The current standard specifies the test methods to evaluate the wind resistance of external blinds and shutters designed to be fitted to buildings, in front of windows, doors or façades and delivered as a complete unit.

This standard applies to:

- Shutters: roller shutter, external venetian blind, wing shutter, venetian shutter, concertina shutter, flat closing concertina shutter and sliding panel shutter (including those with projection systems).
- External blinds: folding arm awning, trellis arm awning, pivot arm awning, marquise, vertical awning, façade awning, conservatory awning, roof window awning and Pergola awning.

whatever the nature of the constituent materials, under normal operating conditions and installed in compliance with the manufacturer's installations instructions.

Dutch awnings (adjustable or fixed) and brise-soleil are not included.

NOTE The wind resistance of such products shall be evaluated by calculations.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12216, *Shutters, external blinds, internal blinds – Terminology, glossary and definitions.*

prEN 13561:2010, *External blinds and Awnings – Performance requirements including safety.*

prEN 13659:2010, *Shutters and External Venetian Blinds – Performance requirements including safety.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12216, FprEN 13561:2011 and FprEN 13659:2011 and the following apply.

3.1

test pressure p

pressure exerted on the external or internal face of the test sample which represents the differential pressure (difference in pressure between the two faces) exerted by the wind on the external blind/awning or the shutter

3.2

nominal pressure p_N

test pressure under which the test sample does not sustain deformation or deterioration detrimental to its correct operation.

3.3

safety pressure p_S

test pressure under which no deterioration which may be dangerous for the persons shall be observed.

NOTE p_N and p_S are defined in the classification specified in FprEN 13561:2011 and FprEN 13659:2011.

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3.4 nominal load F_N
load applied to the test sample allowing the reproduction of the effects due to the uniform nominal pressure p_N exerted on the test sample

3.5 safety load F_S
load applied to the test sample allowing the reproduction of the effects due to the uniform safety pressure p_S exerted on the test sample

4 Test conditions

4.1 General

The tests shall be carried out with the maximum dimensions defined by the manufacturer (see clause 4.2) in the most unfavourable configuration for each product type. The test results obtained can then be applied to all more favourable configurations and to all smaller dimensions in the particular product design.

NOTE For example, for the same dimensions, a conservatory awning with relieving rollers could be considered a better configuration than without relieving rollers, for the same product design.

4.2 Dimensions of test samples

4.2.1 General

The dimensional technical limits are the maximum dimensions for the width and height (L_{max} and H_{max}) associated with the maximum surface area (S_{max}) specified by the manufacturer.

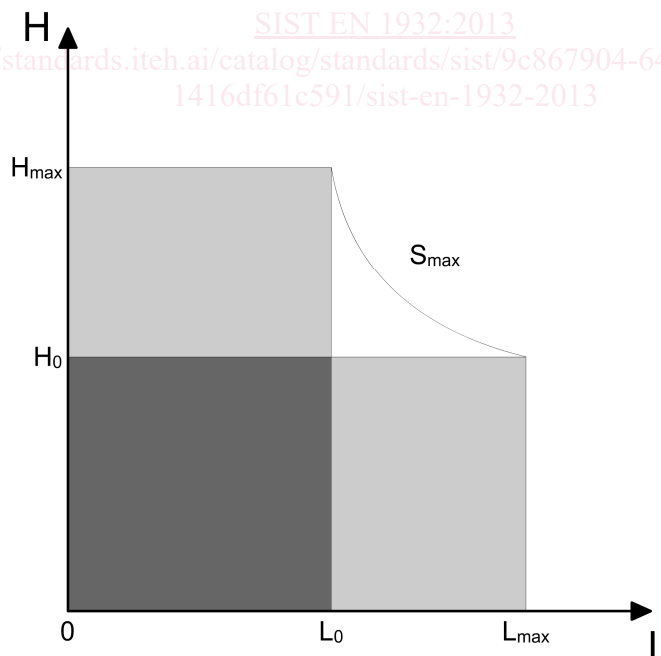


Figure 1 — Dimensions of test samples

To be representative of a range, the samples submitted for test shall be of the following dimensions (see Figure 1):

- the maximum width associated with the greatest height achievable with this width ($L_{max} \times H_0$),

and

- the maximum height associated with the greatest width achievable with this height ($L_0 \times H_{\max}$),

the two tests being necessary for a same range.

4.2.2 Definition of height H

In the case of awnings, H is the distance between the axis of the roller tube and the extremity of the front or bottom bar (see Figure 2 and Figure 3).

In the case the projection of the awning is made of two parts (e.g. for marquisolette), the height H is the sum of the vertical and the projected part: $H = H_1 + H_2$ (see Figure 3).

In the case of roller shutters and external venetian blinds, H is the height of the visible part of the curtain including the bottom lath (see Figure 4 and Figure 5).

In the case of others shutters, H is the height of the curtain.

In the case of conservatory blind, the height to be considered is the distance between the roller tube and the front profile, or between these and the relieving rollers, or between the relieving rollers, whichever is the maximum distance.

4.2.3 Definition of width L

In the case of awnings, L is the width of the fabric.

In the case of shutters, L is the visible width of the curtain.

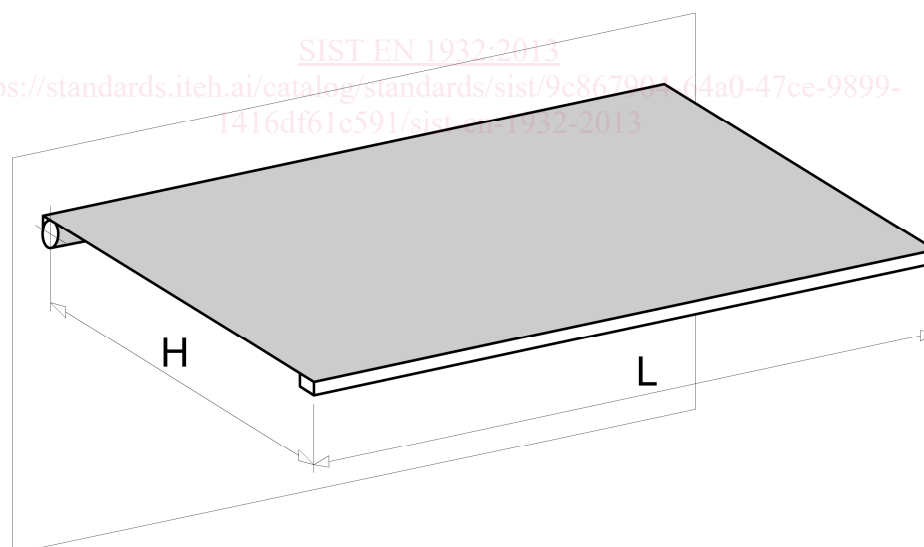


Figure 2 — Dimensions — Example of folding arm awning

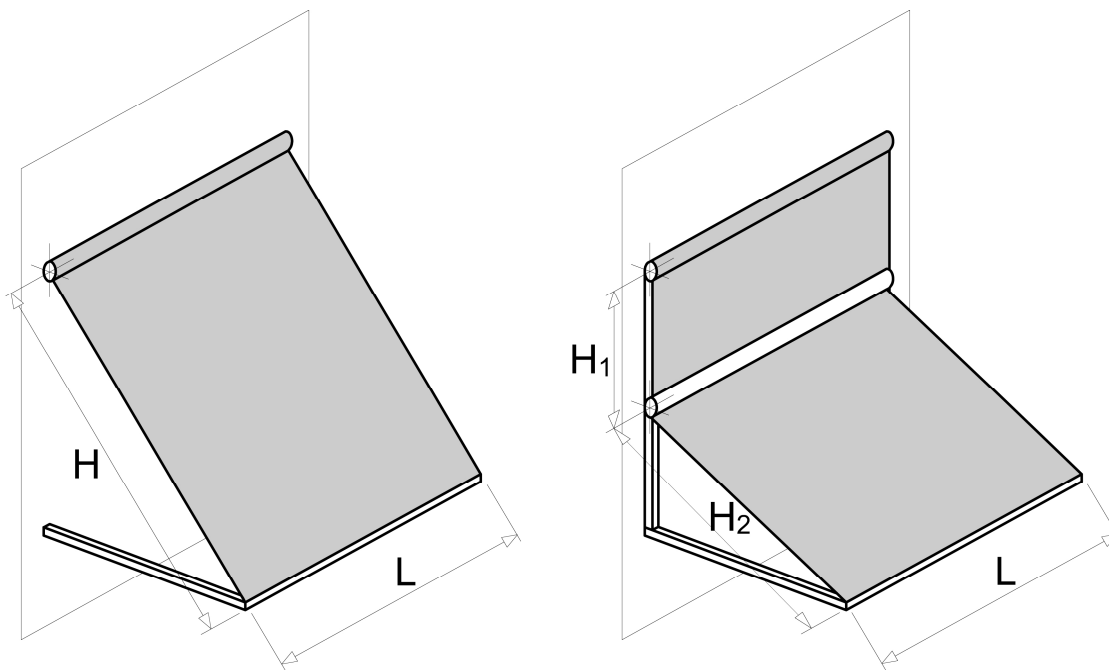


Figure 3 — Dimensions — Example of projection awning and marquisolette

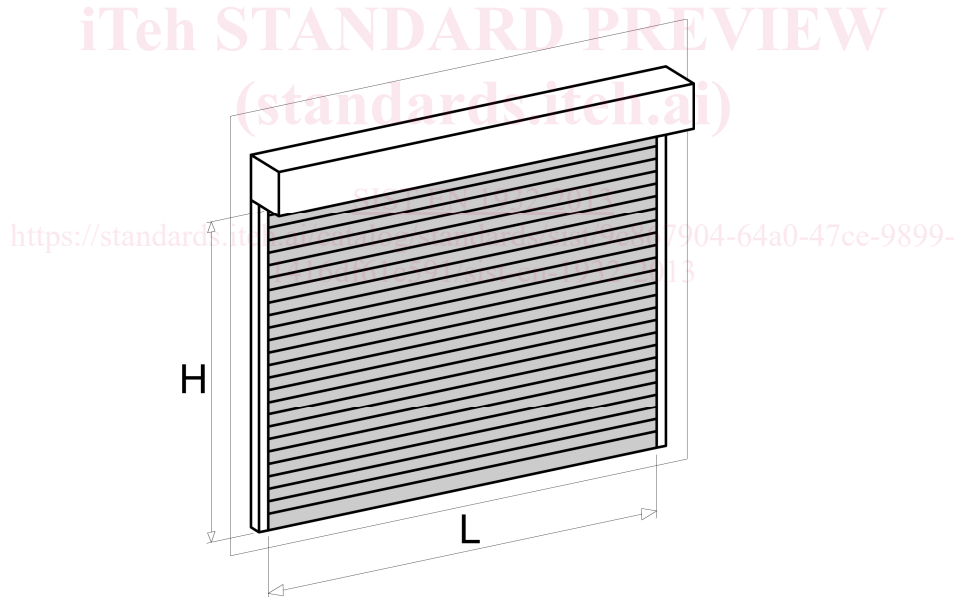


Figure 4 — Dimensions — Example of roller shutter

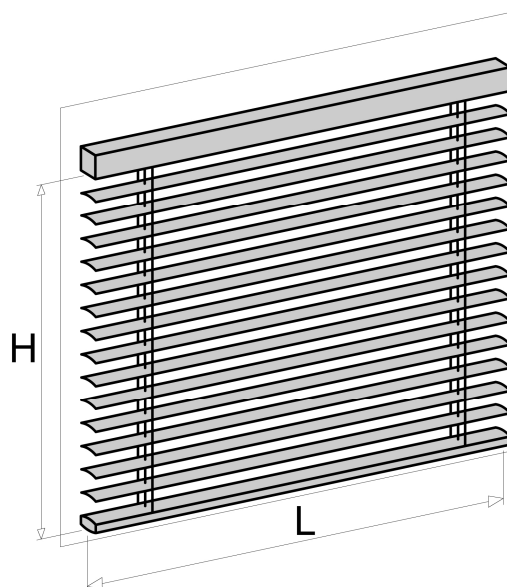


Figure 5 — Dimensions — External venetian blind

4.3 Positioning of test samples

The test samples shall be fixed on a rigid frame by their brackets according to the manufacturer's installation instructions.

4.4 Laboratory conditions

The tests are carried out at room temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

5 Methods of loading

5.1 General

Depending on the type of shutter or external blind tested, different methods of loading are applicable. These are:

- Use of suspended weights on specific points of the test specimen with or without a test bar (see clause 5.2),
- Use of a uniformly distributed load over the curtain of the test specimen (see clause 5.3),
- Use of a pneumatic device reproducing a uniformly distributed pressure over the curtain of the test specimen, with or without a plastic film (see clause 5.4).

The test method(s) applicable is/are specified for each type of shutter and external blind in the relevant clause.

5.2 Method N°1: use of suspended weights

Test loads are obtained by using suspended weights (direct loading) and by using pulleys or another system for which the friction is negligible compared to the applied loads (reverse loading).

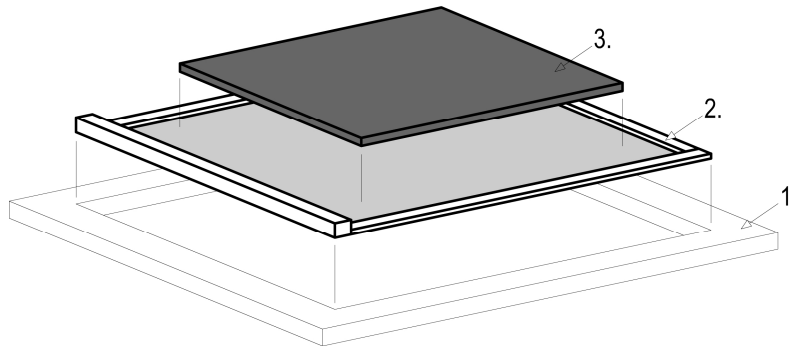
If the use of a test bar is required, it shall be at least as rigid as the roller tube of the test specimen.

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5.3 Method N°2: use of a uniformly distributed weight

Test loads are obtained by using a mattress of 10 cm of thickness and adding the missing weight, distributed in a uniform way, over the mattress (see Figure 6).

The total weight applied shall be the test load reduced by the weight of the curtain. In the case the missing weight is applied of punctual loads, at least nine loads per m² shall be distributed at regular intervals on the mattress.

**Key**

- | | |
|---|-------------|
| 1 | Rigid frame |
| 2 | Awning |
| 3 | Mattress |

Figure 6 — Example of method of loading N°2 for a guided awning

The mattress width and height shall be 20 cm smaller than the width and the height of the visible part of the curtain in order to avoid blocks to the free movements of the curtain (see Figure 7).

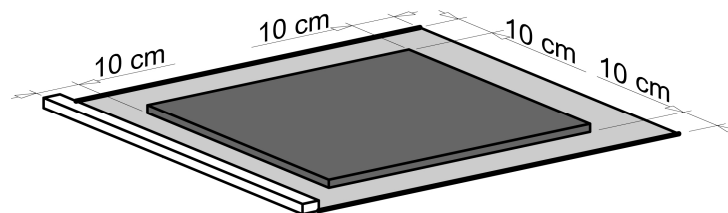


Figure 7 — Dimensions of mattress

The mattress used shall have the following characteristics:

- Weight: 3000 g/m² ± 5%
- Density: 30 ± 2 kg/m³
- Hardness: 170 ± 20 A40 according to ISO 2439

5.4 Method N°3: use of a pneumatic device

The test pressures are obtained by using a pneumatic pressure equipment able to withstand the pressure of the class foreseen. The test apparatus shall be as follows (see Annex A):

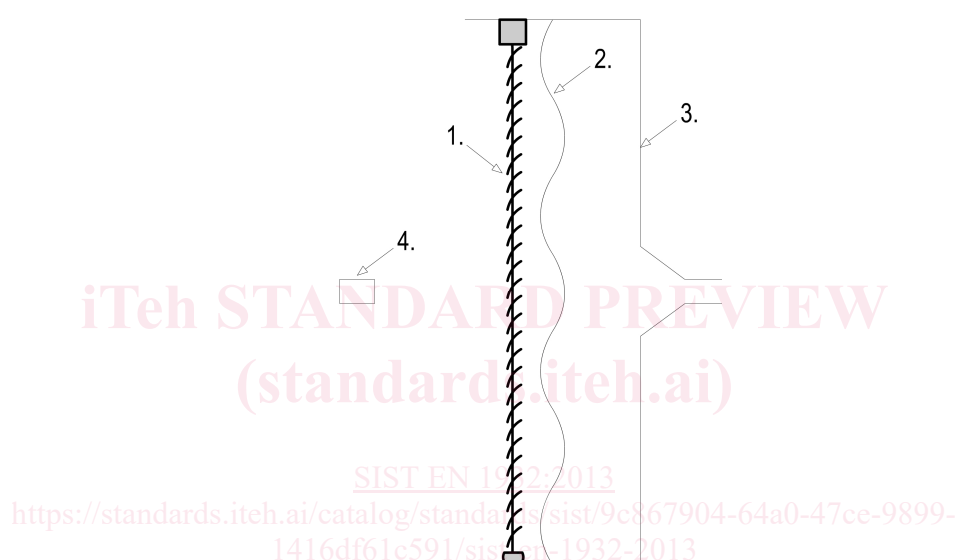
- a solid wall with a frame allowing installation of the shutter. In the centre, an opening shall allow the introduction or extraction of air.

- a device applying a controlled air pressure over the shutter,
- a device allowing the reversion of the pressure,
- with an accuracy of $\pm 5\%$ of the measured pressure.

If specified, the test pressures may be achieved using an airtight non-elastic film which shall not contribute to the resistance of the test specimen. The film shall be sealed around the edges of the frame, loosely enough so that it will not be fully deployed once the pressure is applied: the dimensions of the film shall be at least 30% larger than the dimensions of the frame.

NOTE For example, the film Tyvek® could suit for the tests.

If such measurements are required, a measuring tool shall be used to measure the displacement of the curtain on a horizontal axis, (see Figure 8).



Key

- | | |
|---|-------------------------|
| 1 | External venetian blind |
| 2 | Film |
| 3 | Pressure chamber |
| 4 | Measuring tool |

Figure 8 — Example of method of loading N°3 for external venetian blinds

6 Test loads

In case the test loads are reproduced by applying punctual or distributed weights over the curtain of the external blind or the shutter, the test loads shall be calculated according to Table 1 for external blinds and awnings and to Table 2 for shutters.

Table 1 — External blinds and awnings — Calculation of test loads

Nominal load	Safety load
$F_N = \beta \times p_N \times L \times H \times \alpha$	$F_S = \gamma \times F_N$, with $\gamma = 1,2$