BRITISH STANDARD

BS EN
12833:2001

Skylight and conservatory roller shutters — Resistance to snow load — Test method

The European Standard EN 12833:2001 has the status of a British Standard

ICS 91.060.50

National foreword

This British Standard is the official English language version of EN 12833:2001.

The UK participation in its preparation was entrusted by Technical Committee B/538, Doors, windows, shutters, hardware and curtain walling, to Subcommittee B/538/3, Domestic shutters and blinds, 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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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 June 2001

Summary of pages

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EUROPEAN STANDARD

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EN 12833

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English version

Skylight and conservatory roller shutters - Resistance to snow load - Test method

Volets roulants pour fenêtres de toit et véranda - Résistance à la charge de neige - Méthode d'essai

Rolläden für Dachflächenfenster und Wintergärten - Widerstand gegen Schneelast - Prüfverfahren

This European Standard was approved by CEN on 7 March 2001.

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Management Centre: rue de Stassart, 36 B-1050 Brussels

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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of an identical text or by endorsement, at the latest by October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

It is part of a series of standards dealing with blinds and shutters for buildings as defined in prEN 12216:1995.

Snow effects on sloping shutters result in pressures which are reproduced by the following tests.

The test method is linked to performance requirements for shutters specified in prEN 13659:1999.

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.

1 Scope

This European Standard specifies the methods of test to be applied to evaluate the snow load resistance performances of shutters inclined less than 60° from the horizontal, those resistant either alone or in mechanical association with the glazing.

It applies to

- skylight roller shutters ;
- conservatory roller shutters.

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 (including amendments).

EN 1932	"External blinds and shutters - Resistance to wind loads - Method of testing"
prEN 12216:1995	“Shutters, external blinds, internal blinds – Terminology, glossary and definitions”
EN 13527	"Shutters and blinds - Measurement of operating force - Test methods"
prEN 13659:1999	"Shutters – Performance requirements including safety”

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in prEN 12216:1995 and the following apply.

3.1
direct nominal test pressure p_N
uniform pressure or loads reproducing a uniform pressure, exerted on the external face of the test sample

3.2
safety pressure p_s
uniform pressure or loads set out reproducing a uniform pressure under which there shall be no rupture of the product. The safety pressure p_S is linked to the nominal pressure p_N by the coefficient f_S

3.3
dimensions

3.3.1
height *H*
visible height of the curtain including the bottom lath

3.3.2
width *L*
visible width of the curtain

3.3.3
surface of loading
given by ***L* x *H***

3.4
distance *d*
distance between the internal face of the curtain and the glazing, measured with the curtain in the fully extended position

4 Test conditions

4.1 Test principle

To verify the holding of shutters under nominal pressure p_N and safety pressure p_S representing the particular applicable snow pressure.

Two forms of resistance to snow load are envisaged.

a) The shutter resists alone the snow pressure without contact with the glazing,

The pressure is applied gradually to p_N and the corresponding displacement in the center of the curtain measured.

b) The shutter resists the snow pressure together with the mechanical association with the glazing.

The shutter is tested in association with a rigid panel, parallel to the curtain, representing the glazing, sufficiently rigid to withstand the test pressures without sustaining damage that could interfere with the results.

Under p_N, the curtain shall be in contact with this panel.

4.2 Sample dimensions

The chosen dimensions are linked to the type of resistance envisaged :

a) The shutter alone resists the snow load without contact with the glazing

To be representative of a range of sizes, the sample submitted shall be the maximum width L_1 relative to the maximum height H_1 possible for this width.

Products less wide and no greater in surface area than the surface area of the sample tested $S_1 = L_1 \times H_1$ will be assumed to resist the same snow load, p (See Figure 1)

b) The shutter resists the snow load together with the mechanical association of the glazing.

To be representative of a range of sizes, the sample submitted shall be the minimum width L_2,

- relative to a height H_2 possible for this width,
- ensuring the contact between the curtain and the glazing for the maximum distance d proposed.

Wider products and with a surface area equal to $S_{max} = L_2 \times H_0$, will be assumed to resist the same snow pressure p, with the maximum distance d, between the curtain and the glazing (See Figure 2)

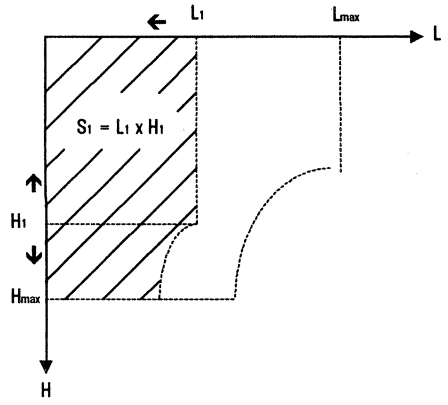

Figure 1 – The shutter resists alone the snow load - Area of allowable dimensions

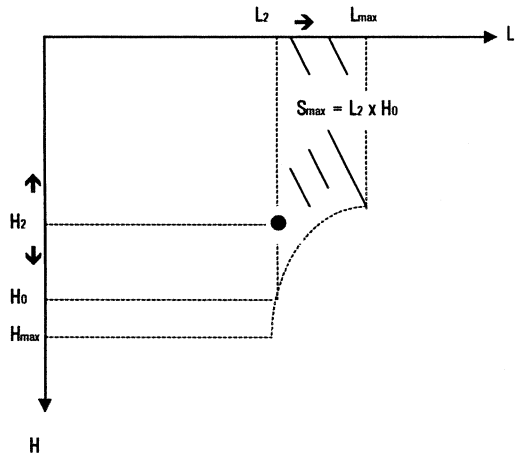

Figure 2 – The shutter resists together with the mechanical association of the glazing - Area of allowable dimensions

4.3 Preparation of the test

4.3.1 Positioning of the shutter

a) the shutter alone resists the snow load without contact with the glazing

The shutter is mounted on a rigid frame and equipped with the operating mechanism and is installed using the fixings according to manufacturer instruction.

b) the shutter resists the snow load together with mechanical association of the glazing

Same mounting as **a)**, the frame being equipped with the rigid panel representing the glazing.

This panel is placed at a distance 1,2 *d* from the curtain, *d* being the maximum distance between the shutter and glazing stated by the manufacturer.

4.3.2 Carrying out of the loading

The curtain is loaded uniformly :

- either in a horizontal positioning so that the effect of the loading produces a uniform pressure. In the case of use of individual loads, nine loads per m² minimum shall be distributed evenly over the curtain ;

- or in a vertical positioning for the test using air pressure of a pneumatic type. If necessary, the loading is achieved with the help of a thin polyester film or similar material which will not add to the resistance of the shutter. The test apparatus is that described in EN 1932 for wind test for shutters (accuracy ±5% of $\boldsymbol{p_N}$).

If the shutter resists together with the glazing, the rigid panel representing the glazing shall be perforated (5 cm² in holes per m²) not to put under pressure the space between the shutter and the glazing.

4.3.3 Test loads

For the particular applicable snow pressure *p*, the nominal pressure $\boldsymbol{p_N}$ and the safety pressure $\boldsymbol{p_S}$ are as follows :

Curtain in the horizontal positioning :

Direct nominal pressure	$p_N = p$
Safety pressure	$p_S = f_S \times p$

Curtain in a vertical positioning : It is necessary to realize a uniform pre-loading, equal to the weight of the curtain by application of a pressure $\boldsymbol{p_0}$ so that :

Direct nominal pressure	$p_N = p + p_0$
Safety pressure	$p_S = f_S \times p + p_0$

where $p_0 = \frac{\text{weight of the curtain}}{\text{surface of the shutter}}$

f_S = safety factor stated in prEN 13659:1999

NOTE The total loads applied during the test are :

- Direct nominal load $F_N = p_N \times H \times L$
- Safety load $F_S = f_S \times F_N$

5 Test methods

The shutter alone resists the snow without contact with the glazing

- apply the direct nominal pressure $\boldsymbol{p_N}$ for 5 min ;

- measure the deflection in the centre of the curtain ;

- 2 min after lifting, measure the operating force according to EN 13257 and record any faults ;

- apply for 5 min the safety pressure $\boldsymbol{p_S}$. Record any resulting damage.

The shutter resists the snow load together with the mechanical association of the glazing

- apply the direct nominal pressure $\boldsymbol{p_N}$ for 5 min. Ensure the curtain is in contact with the panel ;

- 2 min after lifting, measure the operating force according to EN 13527 and record any damages ;

- apply for 5 min the safety pressure $\boldsymbol{p_S}$. Record any resulting damage.

6 Expression of results

At the end of each sequence, carry out an examination of the product and note any faults.

- After applying the nominal pressure $\boldsymbol{p_N}$ **:**

  - Permanent deformation of the laths or guide rails yes/no
  - Exit from the guide rails yes/no
  - Fracture of the laths or guide rails yes/no

Variation as a percentage of the operating force calculated as follows :

$$V\% = 100\left[\frac{P_e}{P_i} - 1\right]$$

where $\boldsymbol{P_i}$ and $\boldsymbol{P_e}$ respectively, are values of the operating force before the test and after carrying out this sequence.

- After applying the safety pressure p_S :

  - Exit from the guide rails - yes/no
  - Fracture of the laths or guide rails - yes/no

Are also given

- The snow pressure *p* corresponding to the test, expressed in N/m²,
- The type of resistance of the shutter to the snow loads
  - shutter alone, or
  - shutter in association together with a glazing located at the maximum distance ***d*** from the shutter, expressed in mm.
- The associated dimensional limits
  - shutter alone : maximum width L_1 and maximum surface area S_1 allowable, or
  - shutter in association together with a glazing at the distance ***d*** : minimum width L_2 and maximum surface area S_{max} allowable.
- For shutter resisting alone, the value of the deflection at the centre of the curtain for the snow test pressure.

7 Test report

The test report contains the following informations :

a) The necessary descriptions to allow identification of the product (list of components of the product, type of laths, etc.) ;

b) The details relative to the type, dimensions, constituent materials, form and make up of the product and its conformity with drawings supplied by the manufacturer ;

c) Complete details of accessories, bracketry and operating mechanism ;

d) Dimensional limits of the product - width, height, surface area, slopes, etc.) ;

e) Dimensions of the product tested ;

f) The results obtained expressed according to clause 6 ;

g) The name of the test laboratory (laboratory or firm), name of the responsible person ;

h) The date of the test ;

i) Reference to this standard.

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London
W4 4AL