



SLOVENSKI STANDARD
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Zunanja senčila - Zahtevane lastnosti, vključno z varnostjo

External blinds and awnings - Performance requirements including safety

Markisen - Leistungs- und Sicherheitsanforderungen

Stores extérieurs - Exigences de performance y compris la sécurité

Ta slovenski standard je istoveten z: prEN 13561 rev

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ICS:

91.060.50 Vrata in okna Doors and windows

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English Version

External blinds and awnings - Performance requirements including safety

Stores extérieurs - Exigences de performance y compris la
sécurité

Markisen - Leistungs- und Sicherheitsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 33.

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Foreword

This document (prEN 13561:2011) 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 13561:2004 + A1:2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directives, see informative Annex ZA and Annex ZB, which is an integral part of this document.

This European Standard is a part of a series of standards dealing with blinds and shutters for buildings as defined in EN 12216.

This European Standard specifies the requirements for external blinds and awnings, the levels of performances and where applicable, the associated classes.

It is completed by test standards as well as by standards referring to specific performance requirements.

The annexes A and B are normative.

Annex C is informative.

This document includes a Bibliography.

- Clause 4 “wind resistance” has been modified in integrate requirements on the shutters and external venetian blinds in the retracted position and has been aligned to the EN 1932 “test methods” under revision. Class 0 has been deleted.
- Clause 10 “Resistance of mechanisms holding the shutter in the extended position” has been clarified and modified to be applicable to any type of shutters and external venetian blinds.
- Clause 14 “Resistance against intrusion” has been added.
- Clause 17 “Additional thermal resistance” has been clarified
- Clause 18 “Total solar energy transmittance” has been added
- Clause 19.2 “Durability of rigid plastic materials” has been aligned to the new version of EN 13245-1.
- Clause 19.3 “Durability of metals” has been clarified
- Clause 20 “Dimensional tolerances” has been modified for external venetian blinds
- Clause 23 “Evaluation of conformity” has been aligned to the European template
- Annex B “Calculation of wind pressure exerted on a shutter” has been modified to consider values of Eurocode 1.
- Annex C “List of significant machine hazards” has been modified. Standard EN ISO 14121-1 has been introduced.
- Annex D “Example of methodology for wind stress determination on fixed parts of shutters” has been added.
- Annex ZA has been modified to introduce a two mandated characteristics : the total solar energy transmittance g_{tot} and the additional thermal resistance ΔR

Introduction

The performances given in this European Standard which illustrate suitability for use, are required for every type of external blind and awnings (intrinsic performances).

Other performances are only required as a complement (specific performances) and result in specific products. Some of them are described in European Standards (e.g. EN 1522, EN 1523). Others are described in EN 14500 and EN 14501 which are related to important issues such as thermal comfort, i.e.:

- Solar factor;
- Shading factor;
- Direct solar transmittance;
- Secondary heat transfert factor;

and visual comfort, i.e.:

- Light control;
- Night privacy;
- Visual contact with the outside;
- Glare control;
- Use of daylight;
- Rendering of colours.

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NOTE Health and Safety regulations require that the workplace receives as much natural light as is reasonably practical (see EU Directive 89/654/EEC) and protection of operators working with VDV screens against glare control and reflected light (see EU Directive 87/391/EEC).

The list of these documents is given in the Bibliography.

With the aim of clarifying the intentions of the standard and avoiding doubts when reading it, following assumptions were made related to power operated products while producing it:

- Negotiations shall occur between the manufacturer and the purchaser concerning particular conditions for use and places for use such as for nursery schools or for buildings for disabled people which need specific risk analysis;
- The risk analysis carried out in this European Standard and the corresponding significant hazards listed in Annex B suppose a normal use or normally predictable use e.g. which excludes deliberate and conscious risks taken by the user (see Interpretative Document “Safety in use” of EU Construction Products Directive).

1 Scope

This European Standard specifies the performance requirements which external blinds and awnings shall fulfil when fitted to a building. It deals also with the significant hazards for construction, transport, installation, operation and maintenance (see list of significant machine hazards in Annex B).

It applies to all external blinds and awnings as well as similar products whatever their design and nature of the materials used, as follows and defined in EN 12216:

- folding arm awning, trellis arm awning, pivot arm awning, slide arm awning, vertical roller awning, marquise, façade awning, skylight awning, conservatory awning, Pergola awning, Dutch awning, insect screen;
- brise-soleil.

This European Standard does not cover the wind resistance of fixed nor semi-fixed products, e.g. Dutch awnings, fixed or mobile and brise-soleil. These types of products shall be evaluated according to the relevant calculation methods (such as Eurocodes).

This European Standard covers the wind resistance of the retractable part of Pergola awnings. However, the structural part of these products is not covered and shall be evaluated according to the relevant calculation methods (such as Eurocodes).

The products covered by this European Standard may be operated manually, with or without compensating springs or by means of electric motors (power operated products).

NOTE This standard covers external blinds and awnings mounted externally. In case such products are installed internally, they should fulfil all relevant safety requirements defined in EN 13120.

This document is not applicable to external blinds and awnings which are manufactured before the date of publication of this document.

The noise emission of power operated external blinds and awnings is not considered to be a relevant hazard. Therefore this standard does not contain any specific requirements on noise in relation to the Machinery Directive.

If not specified otherwise, the term "external blind" used in this document refers to any type of external blinds or awnings included in the scope of this European Standard.

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 ISO 14121-1, *Safety of machinery - Risk assessment - Part 1: Principles*

EN 1070:1998, *Safety of machinery – Terminology.*

EN 1670, *Building hardware – Corrosion resistance – Requirements and test methods.*

prEN 1932:2011, *External blinds and shutters – Resistance to wind loads – Method of testing.*

EN 1933, *Exterior blinds – Resistance to load due to water accumulation – Test method.*

EN 12045, *Shutters and blinds power operated – Safety in use – Measurement of the transmitted force.*

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EN 12194, *Shutters, external and internal blinds – Misuse – Test methods.*

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

EN 13125, *Shutters and blinds – Additional thermal resistance – Allocation of a class of air permeability to a product.*

EN 13527, *Shutters and blinds – Measurement of operating force – Test methods.*

EN 14201, *Blinds and shutters – Resistance to repeated operations (mechanical endurance) – Methods of testing.*

EN 20105-A02, *Textiles – Tests for colour fastness – Part A02: Grey scale for assessing change in colour (ISO 105-A02:1993).*

EN 20139, *Textiles – Standard atmospheres for conditioning and testing (ISO 139:1973).*

EN 20811, *Textiles – Determination of resistance to water penetration – Hydrostatic pressure test.*

EN 60335-1, *Household and similar electrical appliances – Safety – Part 1: General requirements (IEC 60335-1:2001, modified).*

EN 60335-2-97, *Safety of household and similar electrical appliances – Part 2-97: Particular requirements for drives for rolling shutters, awnings, blinds and similar equipment (IEC 60335-2-97:1998, modified).*

EN 61310-1, *Safety of machinery – Indication, marking and actuation – Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:1995).*

EN ISO 105-B04, *Textiles – Tests for colour fastness – Part B04: Colour fastness to artificial weathering – Xenon arc fading lamp test (ISO 105-B04:1994).*

EN ISO 1421, *Rubber- or plastic-coated fabrics – Determination of tensile strength and elongation at break (ISO 1421:1998).*

EN ISO 10077-1, *Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: Simplified method (ISO 10077-1:2000).*

EN ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003).*

ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions in EN 1070:1998 and EN 12216:2002 and the following apply.

3.1

awning

product with a curtain made of fabric or other material, located externally, above, in front of, or within an opening and projecting from a building.

NOTE 1 Folding arm awnings, trellis arm awnings, drop arm awnings, slide arm awnings, marquiselettes and Dutch awnings are examples of awnings.

NOTE 2 An awning may be retractable or fixed. A retractable awning may be retracted by rolling or folding of the fabric.

3.2**external blind**

product made of fabric/material, located externally, above, in front of, or within an opening and extending parallel to a glazing.

NOTE 1 Vertical roller blinds, façade blinds and roof window blinds are examples of external blinds.

3.3**intrinsic performance**

overall performances of the blind regardless of its application as opposed to specific performance

3.4**specific performance**

performance which may be additional and complementary to the intrinsic performances and refers to a specific product (for example thermal, etc.)

3.5**curtain**

part of the product which is set in motion by the operating mechanism and ensures its function

3.6**extension/retraction**

movement of the curtain resulting in an increase/decrease in the surface area covered

3.7**opening/closing**

terms used to describe the increase in light (opening) or reduction of light (closing) in an extended position for products with laths, slats or louvres which can be tilted or adjusted

3.8**rough operation**

sharp action on the operating mechanism or directly on the curtain, resulting in excessive speed at the beginning and a sudden stop at the end

NOTE Rough operation is only possible if the moving part has significant inertia (mass and speed).

3.9**forced operation**

excessive force exerted on the operating mechanism or directly on the curtain with the aim of causing movement in spite of resistance to the travel of the curtain

3.10**reversed operation**

extension or retraction of the curtain occurring in the opposite direction to that intended without use of abnormal force

3.11**winch handle**

operating mechanism consisting of a reel rotated by an operation handle which allows accumulation of a cord, cable or chain

3.12**gear with crank handle**

operating mechanism consisting of a gear attached to an axle, a drive shaft, an universal joint, a rotating rod and a crank handle

prEN 13561:2011 (E)**3.13****one direction movement of the operating mechanism**

operating mechanism operated by a single cord, belt, etc., extension / retraction being effected by relying on gravity or the potential energy stored up during retraction / extension (respectively)

3.14**endless movement of the operating mechanism**

operating mechanism operated by a loop, movement in one direction extends the curtain (or tilts the laths) and in the reverse retracts the curtain (or tilts the laths) in the opposite direction

3.15**determination of performance**

means of verification of the performance relating to the corresponding requirement

4 Wind resistance**4.1 In the extended position****4.1.1 General**

The wind resistance of an external blind is characterised by its ability to withstand specified loads simulating the action of wind in positive or negative pressure.

Wind resistance is specified through classes defined by threshold values of nominal pressure p_N and safety pressure $p_S = \gamma \times p_N$ with $\gamma = 1,2$:

- Nominal wind pressure p_N : it represents the wind pressure under which the external blind shall not sustain deformation or deterioration detrimental to its correct operation.
- Safety wind pressure p_S : it represents the wind pressure under which no deterioration which may be dangerous for the persons shall be observed (e.g. breakage, exit from guiding tracks in case of guided blinds).

4.1.2 Determination

The determination shall be in accordance with the test methods specified in FprEN 1932:2011.

NOTE The FprEN 1932:2011 specifies that the test samples shall be of the following dimensions: the maximum width associated with the greatest height achievable with this width and the maximum height associated with the greatest width achievable with this height. Therefore, two tests are necessary for a same range of external blinds.

4.1.3 Performance requirement**4.1.3.1 General**

Depending on the type of external blind considered, the performance criteria applicable and specified in:

- clause 7.1.6 of prEN 1932:2011 for folding arm and treillis arm awnings,
- clause 7.2.6 of prEN 1932:2011 for projecting awning and marquiselette,
- clause 7.3.6 of prEN 1932:2011 for awnings with lateral guiderail without tension system,
- clause 7.4.6 of prEN 1932:2011 for awnings with lateral guiderail with fabric running into the lateral rails without tension system,

- clause 7.5.6 of prEN 1932:2011 for awning with lateral guiderail with tension system
- or
- clause 7.6.6 of prEN 1932:2011 for the retractable part of Pergola awnings

shall be fulfilled.

The classification of the external blinds shall be given according to 4.1.3.2.

4.1.3.2 Classes of wind resistance

The classes of wind resistance are given by the threshold test pressures specified in Table 1.

Table 1 — Classes of resistance to static pressure

Classes	1	2	3
Nominal wind pressure p_N (N/m ²)	40	70	110
Safety wind pressure p_S (N/m ²)	48	84	132

For folding arm awnings, class 2 is the minimum required.

NOTE The conditions to be met in order to fulfill the performance requirement are based on static loads and do not consider the dynamic effect of repeated loads (turbulences) to which the fabric and the frame are submitted in an actual situation. Therefore, the classification does not consider the anchoring of the external blinds on the building.

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4.2 In the retracted position

4.2.1 General

Since some parts of external blinds – for example head boxes, guiderails – cannot be retracted, they have to withstand in some cases very high wind speed. The resulting pressure on the product depends on:

- The installation condition,
- The height of the building,
- The location of the building.

This clause applies to the external blind itself. It does not cover the fixing of the external blind to its support for which the manufacturer shall give guidance in the instructions for installation (see 19.3.2.1).

NOTE As the criteria determining the resulting pressure applied to the fixed parts of external blinds are depending on installation conditions (location, height, ...), it is recommended to refer to National rules – if available – which give such information on the basis of National wind speed map.

4.2.2 Determination

The determination shall be done by calculation when designing the external blind.

NOTE Since the external blinds covered by this standard have a huge variety it is not possible to describe a test method for each product.

prEN 13561:2011 (E)**4.2.3 Performance requirement**

All fixed parts of the external blinds, i.e. the parts that are not retracted when the external blind is in the complete retracted position, shall be designed to withstand a minimum pressure of 800 Pa.

NOTE An example of determination of wind stress applied is given in Annex C.

5 Resistance to water pocket**5.1 General**

This clause is only applicable to folding arm awnings, trellis arm awnings, Dutch awnings and Pergola awnings

Under the action of precipitation, the external blind may retain water forming a pocket of water. The external blind shall withstand the corresponding load.

5.2 Determination

The determination shall be in accordance with the test method specified in EN 1933.

5.3 Performance requirement

For an incline of 14° corresponding to a slope of 25 % (or for a lower incline specified by the manufacturer), the external blind in the fully extended position shall withstand the load created by a possible retention of water by the fabric (no rupture), or the water shall drain off to avoid forming a pocket of water.

After releasing the load and drying of the fabric, the operating effort shall be maintained inside the class.

The instructions for use supplied by the manufacturer shall remind the necessity of retracting the external blind in case of rain if the slope is less than 25 % or less than the value recommended by the manufacturer.

5.4 Performance classes

The performance classes are given in Table 2.

Table 2 — Resistance to water pocket — Performance classes

Classes	1	2
Flow	17 l/m ² ×h	56 l/m ² ×h

6 Resistance to snow load

Apart from fixed products (fixed Dutch awnings) for which the resistance to snow load is justified by calculation according to the relevant regulations, internal blinds covered by this standard are not designed to withstand snow load.

7 Operating effort**7.1 General**

This clause does not apply to power operated products.

The effort F_C needed to extend / retract the curtain and to tilt the laths depends on the type of operation.

7.2 Determination

The determination shall be in accordance with the test methods specified in EN 13527.

7.3 Performance requirement and operating effort classes

7.3.1 General

The operating effort F_C shall not exceed the values specified in Table 3.

Table 3 — Maximum values of the operating effort F_C

Types of operation	F_C (N)	
	Class 1	Class 2
Crank or winch handle ^a	30	15
Belt, cord or chain ^{a,b}	90	50
Rod operation, hand	vertical plane	90
	horizontal or sloping plane	50
<p>For spring loaded systems, $1,5 F_C$ may be reached for locking in the fully extended or retracted position.</p> <p>A blind belongs to class 2 if both the operations of extending / retracting the blind and tilting the laths belong to class 2. Otherwise the blind is class 1.</p> <p>^a Operation mechanism shall also fulfill the requirements in clause 9.</p> <p>^b One direction movement and endless movement of the operating mechanism.</p>		

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7.3.2 Specific case for folding arm awnings (see Figure 1)

The class of operating effort F_C shall be specified by two values:

$$F_C = \{F_{CP}, F_{CN}\}$$

where

- F_{CP} is the maximum value of the peak force, needed to unlock the arms during the first round of the roller tube in retraction, the folding arm awning being in the fully extended position.
- F_{CN} is the maximum value of the operating effort, needed during the remaining travel (retraction and extension).

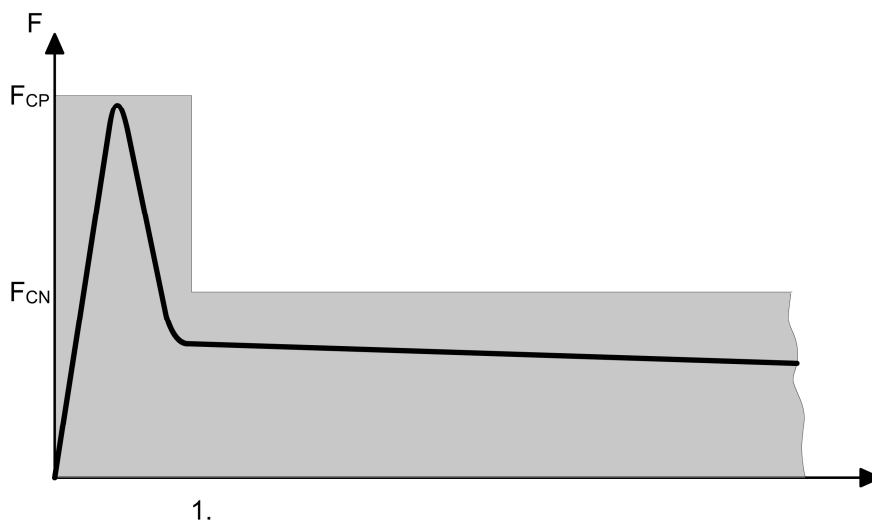
The maximum values for F_C are given in Table 4.

Table 4 — Maximum values for F_C in case of folding arm awning

Crank handle operation	$F_C = \{F_{CP}, F_{CN}\}$ (N)			
	Class 1	Class 2	Class 3	Class 4
	{90, 30}	{60, 15}	{30, 30}	{15, 15}

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NOTE Class 3 and class 4 characterize operations without peak force.



Key

- 1 Rounds of roller tube
- 2 F_{CN} value
- 3 F_{CP} value

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Figure 1 — Folding arm awning — Characterization of a class of operating force with peak

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8 Design of the operating mechanism — Diagrams HPV ("Human Pull Value")

8.1 General

This clause specifies geometrical characteristics of the operating mechanisms taking into account the comfort of the operation.

8.2 Performances requirements

Gear operation

Gear with crank or winch handle shall have:

- a handle of a length R less than or equal to 0,20 m ($R \leq 0,20$ m);
- a reduction ratio r of the gear less than 1:10 (average or mean reduction ratio when, for the same gear, several reductions exist).

NOTE A reduction ratio of 1:10 means it is necessary to make ten turns of the crank to achieve one rotation of the roller tube or axle.

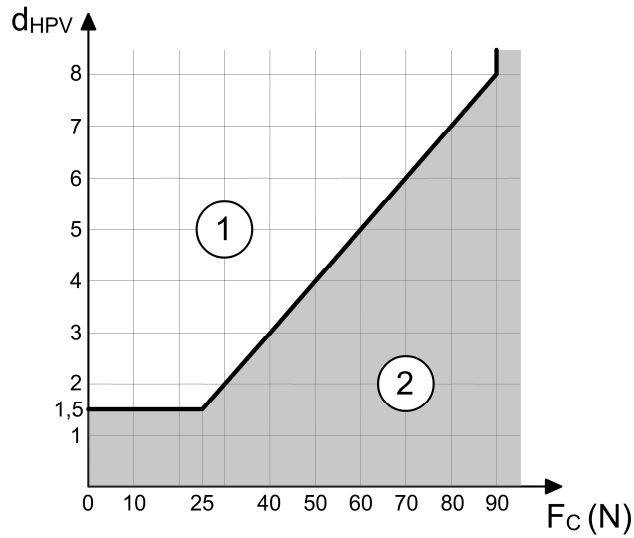
Belt, cord or chain operation

These operating mechanisms shall have the minimal dimensions specified in the HPV diagrams (see Figure 2 and Figure 3).

Apparent cord diameter for HPV

for n cords with diameter d
d is the diameter of a single cord

	n	d _{HPV}
•	1	1d
••	2	1,5d
•••	3	2d
••••	4	2,4d
•••••	5	2,7d
••••••	6	6d

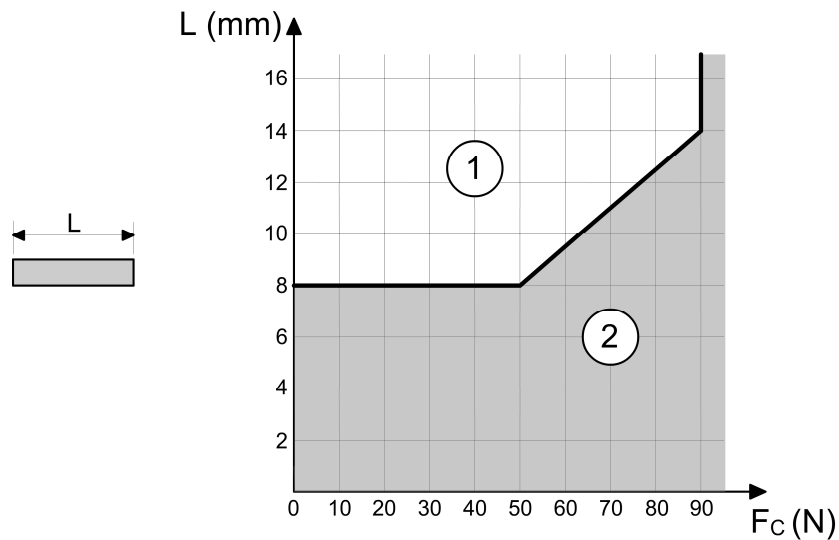


Key

- 1 Acceptable
- 2 Non acceptable
- F_C Operating effort

Figure 2 — HPV Diagrams for cord or chain operation
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For a given diameter d of a single cord and the number n of cords known, the d_{hpv} (in mm) can be determined by use of the table in Figure 2. The diameter calculated can be tested against the diagram at Figure 2 to determine the acceptability relative to the operating effort.



Key

- 1 Acceptable
- 2 Non acceptable
- F_C Operating effort

Figure 3 — HPV Diagram for belt operation