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Polkna in zunanje žaluzije - Zahtevane lastnosti, vključno z varnostjo

Shutters and external venetian blinds - Performance requirements including safety

Abschlüsse außen und Außenjalousien - Leistungs- und Sicherheitsanforderungen

Fermetures et stores vénitiens extérieurs - Exigences de performance y compris la sécurité

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Shutters and external venetian blinds - Performance requirements including safety

Fermetures et stores vénitiens extérieurs - Exigences de performance y compris la sécurité

Abschlüsse außen und Außenjalousien - Leistungs- und Sicherheitsanforderungen

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13659:2015) 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of an identical text or by endorsement, at the latest by November 2015 and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13659:2004+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 Directive(s), see informative Annex ZA and Annex ZB, which are integral parts 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.

The major modifications to the previous edition are:

— 4.1 “Resistance to wind loads” has been modified and has been aligned with the revised version of EN 1932 “Test methods”;

— 4.2 “Resistance of non retractable elements to pressure loads” has been added to integrate requirements on the shutters and external venetian blinds in the retracted position;

— 4.8 “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;

— 4.12 “Prevention of access” has been added;

— 4.14 “Additional thermal resistance” has been clarified;

— 4.15 “Total solar energy transmittance” has been added;

— 4.16 “Materials” has been aligned with the new version of EN 13245-1 for plastics and requirements for metals have been clarified;

— 4.17 “Dimensional tolerances” has been modified for external venetian blinds;

— Clause 7 “Assessment and verification of constancy of performance - AVCP” has been aligned with the European template;

— Annex B “Calculation of wind pressure exerted on a shutter – Allocation of a class of wind resistance” has been modified to consider values of Eurocode 1;

— Annex C “List of significant machine hazards” has been modified and EN ISO 12100 has been introduced;

— Annex D “Example of calculation for the wind resistance determination on fixed parts of shutters in retracted position” has been added;

— Annex ZA has been modified to introduce a two mandated characteristics: the total solar energy transmittance g_{tot}, the additional thermal resistance ΔR and revised in accordance with requirements of the CPR.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned, i.e. power operated products, and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard specifies the performance requirements for shutters and external venetian blinds intended to be fitted externally to buildings and other construction works. It deals also with the significant hazards for assembly, transport, installation, operation and maintenance (see list of significant machine hazards in Annex C).

It applies to all shutters and external venetian blinds whatever their use and nature of the materials used, as follows and defined in EN 12216:

— external venetian blind, roller shutter, wing shutter, Venetian shutter, flat-closing concertina shutter, concertina shutter or sliding panel shutter, with or without a system of projection.

These products can be operated manually with or without compensating spring, or by means of electric motors (power operated products). However, the durability and endurance of the autonomous supply for power operated shutters and external venetian blinds not connected to the mains supply are not covered.

This European Standard deals also with all significant hazards, hazardous situations and events when shutters and external venetian blinds are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Annex D).

This European Standard covers shutters and external venetian blinds mounted externally. In case such products are installed internally, they should fulfil all relevant safety requirements defined in EN 13120.

The noise emission of power operated shutters and external venetian blinds is not considered to be a relevant hazard health and safety requirements. Therefore this European Standard does not contain any specific requirements on noise health and safety objective.

2 Normative references

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

EN 204, *Classification of thermoplastic wood adhesives for non-structural applications*

EN 1522, *Windows, doors, shutters and blinds - Bullet resistance - Requirements and classification*

EN 1523, *Windows, doors, shutters and blinds - Bullet resistance - Test method*

EN 1627, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Requirements and classification*

EN 1628, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under static loading*

EN 1629, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance under dynamic loading*

EN 1630, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts*

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

EN 1932, *External blinds and shutters - Resistance to wind loads - Method of testing and performance criteria*

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

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

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

EN 12833, *Skylight and conservatory roller shutters - Resistance to snow load - Test method*

EN 13123-1, *Windows, doors and shutters - Explosion resistance - Requirements and classification - Part 1: Shock tube*

EN 13123-2, *Windows, doors, and shutters - Explosion resistance - Requirements and classification - Part 2: Range test*

EN 13124-1, *Windows, doors and shutters - Explosion resistance - Test method - Part 1: Shock tube*

EN 13124-2, *Windows, doors and shutters - Explosion resistance - Test method - Part 2: Range test*

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

EN 13245-1, *Plastics - Unplasticized poly(vinyl chloride) (PVC-U) profiles for building applications - Part 1: Designation of PVC-U profiles*

EN 13330, *Shutters - Hard body impact and prevention of access - Test methods*

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 14648, *Building hardware - Fittings for shutters - Requirements and test methods*

EN 14500, *Blinds and shutters - Thermal and visual comfort - Test and calculation methods*

EN 14501, *Blinds and shutters - Thermal and visual comfort - Performance characteristics and classification*

EN 14759, *Shutters - Acoustic insulation relative to airborne sound - Expression of performance*

EN 60335-2-97, *Household and similar electrical appliances - Safety - Part 2-97: Particular requirements for drives for rolling shutters, awnings, blinds and similar equipment*

EN 61310-1, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, acoustic and tactile signals*

EN ISO 10077-1, *Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 1: General (ISO 10077-1)*

EN ISO 12100, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100)*

ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests*

ISO 11228-3, *Ergonomics - Manual handling - Part 3: Handling of low loads at high frequency*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100, EN 12216, EN 12045 and the following apply.

3.1
shutter
product, where the curtain is made of a rigid material, installed to provide or modify characteristics such as thermal and visual properties of an existing glazed surface (e.g. window, door) to which it is applied

Note 1 to entry: If not specified otherwise, the term “shutter” used in this document refers to any type of shutter or external venetian blind included in the scope of this European Standard.

3.2
intrinsic performance
overall performances of the shutter regardless of its application as opposed to specific performance

3.3
specific performance
performance which may be additional and complementary to the intrinsic performances and refers to a specific product (for example, acoustic, thermal, burglary resistance, etc.)

3.4
curtain
that part of the product which is set in motion by the operating mechanism, and ensures its function

3.5
extension/retraction
movement of the curtain resulting in an increase/decrease the surface area covered

3.6
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

Note 1 to entry: The common parlance uses “open” for retraction and “closed” for extension.

3.7
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 1 to entry: Rough operation is only possible if the moving part has significant inertia (mass and speed).

3.8
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

3.9
reversed operation
extension or retraction of the curtain occurring in the opposite direction to that intended without use of abnormal force

3.10
winch handle
operating mechanism consisting of a reel rotated by an operation handle which allows accumulation of a cord, cable, or chain

3.11
gear with crank handle
operating mechanism consisting of a gear attached to an axle, a drive shaft, a universal joint, a rotated rod and a crank handle

3.12
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

3.13
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

3.14
monocommand
same mechanism which achieves both opening/closing and extension/retraction

3.15
determination of performance
means of verification of the performance relating to the corresponding requirement

4 Product characteristics

4.1 Resistance to wind loads

The wind resistance of a shutter is characterized 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 $\gamma = 1,5$:

— Nominal wind pressure p_N: it represents the wind pressure under which the shutter 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 (breakage, coming out from the fixing or locking devices).

When tested according to EN 1932, the wind resistance class of shutters shall be given according to Table 1.

Table 1 — Classes of wind resistance

	Classes						
	0	1	2	3	4	5	6
Nominal pressure p_N (N/m^2)	< 50	50	70	100	170	270	400
Safety pressure $p_S = 1,5\ p_N$ (N/m^2)	< 75	75	100	150	250	400	600

NOTE 1 The application of a static pressure over the shutter gives the classification shown in Table 1. It provides an accurate measurement of the intrinsic resistance of a shutter but does not consider the dynamic behaviour of such a shutter in real wind conditions. Annex B gives the rule allowing the calculation of the wind speed from the static pressure for which the shutter has been classified. This calculation rule considers the coefficient C_p of the shutter, i.e. the algebraic difference between the external pressure coefficient C_{pe} and the internal pressure coefficient C_{pi}. The coefficient C_p is mainly depending on the air permeability of the shutter.

NOTE 2 EN 1932 states that "*the tests shall be carried out with the maximum dimensions defined by the manufacturer 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". For External Venetian Blinds, the dimensions of the test specimens have been fixed (see Annex B and EN 1932:2013, 8.2.3).

4.2 Resistance of non retractable elements to pressure loads

Since some parts of shutters – for example head boxes, guiderails – cannot be retracted, they shall 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 shutter itself. It does not cover the fixing of the shutter to its support for which the manufacturer shall give guidance in the instructions for installation (see 6.3.2).

As the criteria determining the resulting pressure applied to the fixed parts of shutters 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.

The resistance shall be evaluated by calculation using the following procedure:

a) Determine the weakest point of the shutter;

b) Determine the maximum surface where wind stress can be applied;

c) Determine the worst case angle where the wind can apply;

All fixed parts of the shutters, i.e. the parts that are not retracted when the shutter is in the complete retracted position, shall be designed so that there shall be no permanent deformation after a pressure of 800 Pa has been applied.

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

4.3 Resistance to snow load (roller shutters only)

4.3.1 General

This clause is only applicable to roller shutters for skylight and conservatory for which the inclination angle from the horizontal is less than 60°.

Under the weight of snow, the shutter fitted to the window shall not sustain deformation or deterioration which is detrimental to its correct operation and the curtain shall not exit from its guide rails.

Two ways of resistance are considered:

1) the shutter itself resists the snow pressure;

2) the shutter resists the snow pressure together with the mechanical association of the glazing, fitted at a distance d defined by the manufacturer.

This second way of resistance is allowed only if the following requirements are fulfilled:

— the shutter accepts a level of deformation resulting in contact with the glazing under the snow loading;

and

— the distance between the shutter and the glazing is not modified by the opening of the window.

4.3.2 Determination of performance

The determination of performance shall be in accordance with the test method specified in EN 12833.

4.3.3 Performance requirement

The shutter resists to the snow pressure p_N, maximum snow pressure specified by the manufacturer, if the following requirements are fulfilled:

— after having applied the nominal pressure p_N, the operating effort shall be maintained within the limit of the initial class;

— under the safety pressure $p_S = \gamma \times p_N$ with $\gamma = 1,5$, the shutter shall not break or exit from the guide rails.

4.3.4 Expression of the results

The results shall be expressed as follows:

a) if the shutter resists itself the snow pressure:

   1) the manufacturer shall declare:

      i) the maximum nominal snow pressure p_N expressed in N/m^2;

      ii) the following form of resistance: shutter alone;

   2) shutters of the same range which are narrower and for which the curtain surface is lower than the product tested shall be deemed to resist at least the same snow pressure p_N than the product tested.

b) if the shutter resists the snow pressure with the mechanical association of the glazing:

   1) the manufacturer shall declare:

      i) the maximum nominal snow pressure p_N expressed in N/m^2;

      ii) the following form of resistance: shutter in association with a glazing which withstands pressure p_N and located at the maximum distance d from the shutter;

   2) shutters of the same range with a width and a height higher than those of the product tested shall be deemed to resist at least the same snow pressure p_N at the condition that the distance from the glazing remains the same.

4.3.5 Classes of snow resistance

No classes are defined for snow resistance.

For each dimension, the manufacturer shall specify the maximum snow pressure the shutter can sustain, by itself or in mechanical association with a closed window.

4.4 Operating effort

4.4.1 General

This clause does not apply to power operated products.

The effort F_c needed to extend /retract the curtain, to tilt the laths and eventually to project the curtain depends on the type of operation.