BS EN 13561:2015

Incorporating corrigendum March 2016

BSI Standards Publication

External blinds and awnings — Performance requirements including safety

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National foreword

This British Standard is the UK implementation of EN 13561:2015, incorporating corrigendum March 2016. It supersedes BS EN 13561:2004+A1:2008 which is withdrawn.

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.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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EUROPÄISCHE NORM

EN 13561

May 2015

Incorporating corrigendum March 2016

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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

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Foreword

This document (EN 13561:2015) 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of an identical text or by endorsement, at the latest by November 2015 and conflicting national standards shall be withdrawn at the latest by February 2017.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 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 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:

— the scope has been modified to integrate Pergola awnings;

— 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 external blinds and awnings in the retracted position;

— 4.6 “Operating mechanism - Diagrams HPV (“Human Pull Value”)”, the use of the HPV diagram has been clarified;

— 4.11 “Additional thermal resistance ΔR” has been clarified;

— 4.12 “Total solar energy transmittance g_{tot}” has been added;

— 4.14 “Materials“, the part related to fabrics has been reviewed completely and EN ISO 105-B04 and EN 12280-2 have been integrated. Requirements for metals have been clarified;

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

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

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

— Annex ZA has been modified to introduce a new mandated characteristic: the total solar energy transmittance g_{tot} and revised in accordance with requirements of the CPR.

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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.

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1 Scope

This European Standard specifies the performance requirements for blinds and awnings 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 B).

It applies to all external blinds and awnings 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 blind, marquisolette, façade awning, skylight awning, conservatory awning, Pergola awning, Dutch awning, insect screen; brise-soleil.

This European Standard does not cover the wind resistance of non-retractable products, e.g. Dutch awnings and brise-soleil.

The structural part to which the Pergola awning is fixed is not covered.

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). However, the durability and endurance of the autonomous supply for power operated external blinds and awnings not connected to the mains supply are not covered.

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

This European 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.

The noise emission of power operated external blinds and awnings is not considered to be a relevant hazard according to the machinery 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 1522, *Windows, doors, shutters and blinds - Bullet resistance - Requirements and classification*

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

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 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*

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

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

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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 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)*

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 (IEC 60335-2-97)*

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

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

EN ISO 139, *Textiles - Standard atmospheres for conditioning and testing (ISO 139)*

EN ISO 1421, *Rubber- or plastics-coated fabrics - Determination of tensile strength and elongation at break (ISO 1421)*

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)*

EN ISO 13934-1, *Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1)*

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 in EN ISO 12100 and EN 12216 and the following apply.

3.1
external blinds / awnings
product, where the curtain is made of a flexible 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 “external blind” used in this document refers to any type of external blinds or awnings included in the scope of this European Standard.

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3.2
intrinsic performance
overall performances of the blind 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 thermal, etc.)

3.4
curtain
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 in 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

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, an universal joint, a rotating 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

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3.14
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 an external blind 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 $\gamma = 1{,}2$:

— 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).

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

Table 1 — Classes of wind resistance

Classes	0	1	2	3	4	5	6
Nominal wind pressure p_N (N/m^2)	< 40	40	70	110	170	270	400
Safety wind pressure p_S (N/m^2)	< 48	48	84	132	204	324	480

Table 1 applies to all external blinds. However, the maximum class allowed for folding arm awnings shall be class 2. Classes from 4 to 6 are only allowed for external blinds with fabric running in lateral guide rails and Pergola awnings.

NOTE 1 This maximum class for folding arm awnings has been defined to take into account the resistance of the fixing system and the dynamic effect of the wind.

The manufacturer shall define a maximum speed above which the external blind shall be retracted. This wind speed shall be indicated in the instructions for use.

For folding arm awnings and trellis arm awnings having more than two arms, the size limit for the same class shall be determined considering the maximum width of fabric applied to one arm for the same projection (H).

NOTE 2 The conditions to be met in order to fulfil 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 static pressure cannot be used to define the anchoring of the external blinds on the building.

4.2 Resistance of non retractable elements to pressure loads

Since some parts of external blinds – 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,

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— 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 6.3.2).

NOTE 1 As the criteria determining the resulting pressure applied to the fixed parts of external blinds are depending on installation conditions (location, height,…). National rules – if available – can give such information on the basis of National wind speed map.

When calculated according to the following methodology:

a) determine the weakest point of the external blind;

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 external blinds, i.e. the parts that are not retracted when the external blind 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 2 An example of determination of wind stress applied is given in Annex C.

4.3 Resistance to snow load (non retractable external blinds only)

The resistance to snow load of non retractable external blinds shall be justified by calculation according to the relevant regulation, e.g. Eurocode 3 for steel structures or Eurocode 9 for aluminium structures.

4.4 Resistance to water pocket

4.4.1 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.

4.4.2 Determination of performance

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

4.4.3 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.

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4.4.4 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 per hour	56 l/m^2 per hour

4.5 Operating effort

4.5.1 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.

4.5.2 Determination of performance

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

4.5.3 Performance requirement and operating effort classes

4.5.3.1 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	50
	horizontal or sloping plane	50	30
For spring loaded systems, 1,5 F_c may be reached for locking in the fully extended or retracted position. 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. [a] Operation mechanism shall also fulfil the requirements in 4.7. [b] One direction movement and endless movement of the operating mechanism.			

4.5.3.2 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;

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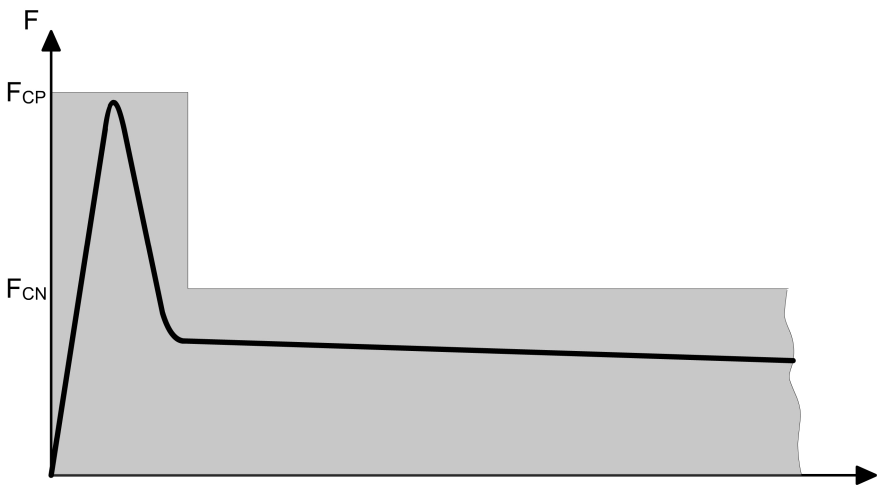
F_{CN} is the maximum value of the operating effort, needed during the remaining travel (retraction and extension).

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}

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



1.

Key

1 rounds of roller tube

2 F_{CN} value

3 F_{CP} value

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

4.6 Operating mechanism — Diagrams HPV (“Human Pull Value”)

4.6.1 General

This clause specifies geometrical characteristics of the operating mechanisms taking into account the comfort of the operation. It does not apply to power operated external blinds.

4.6.2 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 ≤ 0,20 m);

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— 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 maximum reduction ratio of 1:10 means it is necessary to make 10 turns or less of the crank to achieve one rotation of the roller tube or axle.

Belt, cord or chain operation

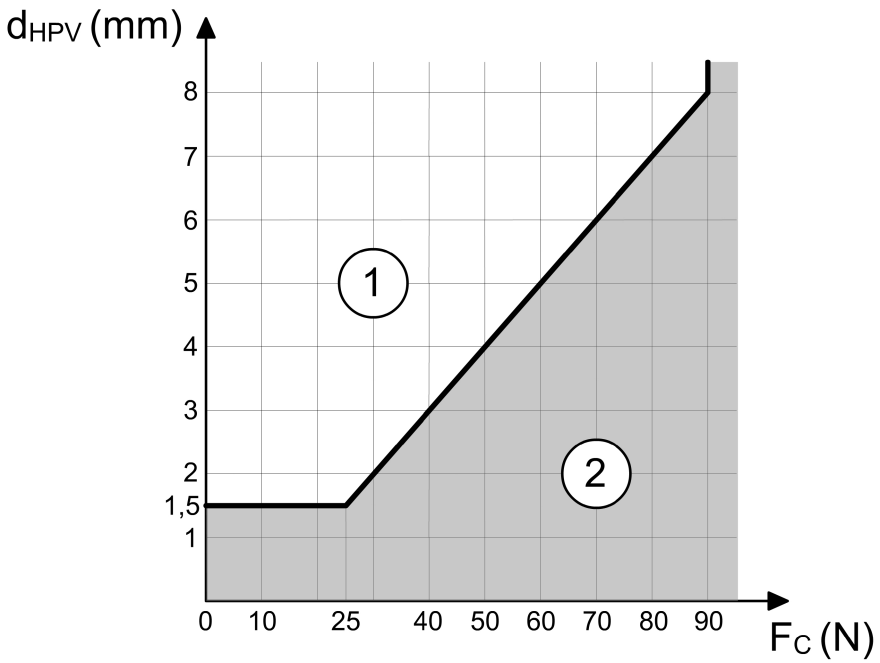
These operating mechanisms shall have the minimal dimensions specified in the HPV diagrams (see Figure 2 and Figure 3).

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

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.

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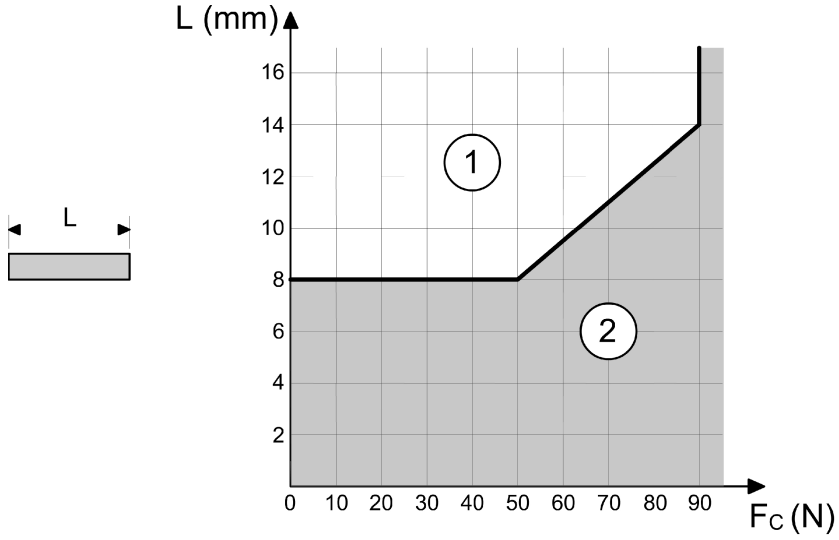

Key

1 acceptable

2 non acceptable

F_C operating effort

Figure 3 — HPV Diagram for belt operation

4.7 Resistance in case of misuse

4.7.1 Curtain and laths

4.7.1.1 General

Under the action of abnormal but foreseeable use (misuse), the external blind shall not become misshapen or damaged to the extent that:

a) the damage impairs its correct operation;

b) the damage which leads to a deterioration in appearance.

Misuse operations are related to the displacement of the curtain and to the tilting of the laths.

4.7.1.2 Displacement of the curtain

— **Rough operation**

Rough operation occurs during extension and retraction.

— **Forced operation**

Forced operation occurs in the direction of extension and retraction, the curtain being either stopped or blocked in extended or retracted position, or blocked in an intermediate position.

Figure 4 illustrates the six possibilities of forced operations.

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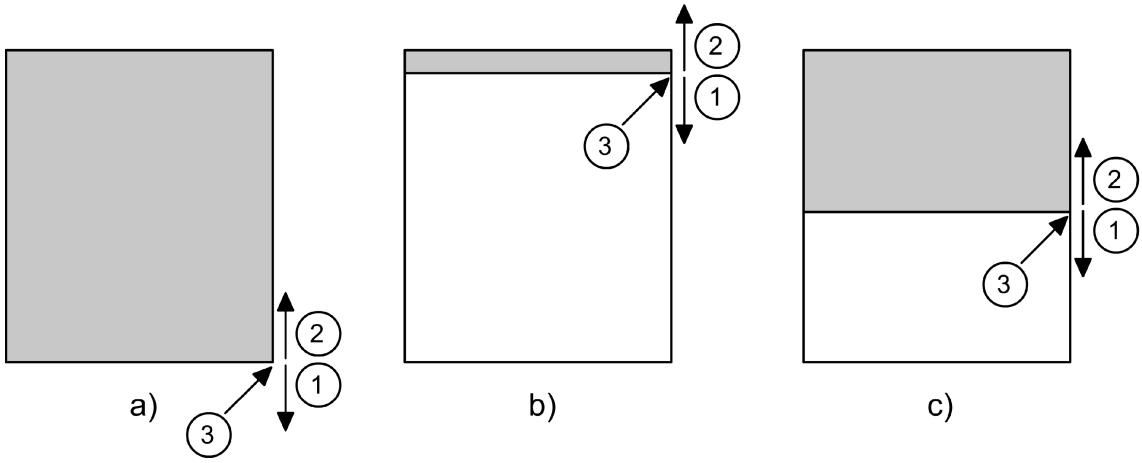

Key

1 direction of extension

2 direction of retraction

3 obstruction

a curtain fully extended

b curtain fully retracted

c curtain in intermediate position, obstructed during extension and/or retraction

Figure 4 — Illustration of the six possibilities of forced operation

In the case of the folding arm awning, only the situations a1 and b2 shall be taken into account.

— **Reversed operation**

Reversed operations are only applicable to roller blinds or to products using a rolling mechanism for extension or retraction.

For these products, operation in situation a1 or b2 illustrated in Figure 4, is a reversed operation when the movement in the opposite direction is possible with an effort less than the limit of the class of operation. If the movement is not possible, it is a forced operation.

Reversed operation occurs on extension with the curtain fully extended and on retraction with the curtain fully retracted.

4.7.1.3 Tilting of the laths

— **Rough operation**

Rough operation is not possible, the conditions defining its occurrence are not likely to occur (no excessive speed, no inertia of laths).

— **Forced operation**

Forced operation occurs in both closed positions which are the result of tilting the laths in both directions from the open position.

— **Reversed operation**

Not applicable.

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