External blinds - Performance requirements including safety

This European Standard was approved by CEN on 9 February 2004.

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</table>
Foreword

This document (EN 13561:2004) 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of an identical text or by endorsement, at the latest by November 2004, and conflicting national standards shall be withdrawn at the latest by November 2004.

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 annexes ZA and 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.

This European Standard specifies the requirements for external blinds, 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.

No existing European Standard is superseded.

The annexes A and B are normative.

This document includes a Bibliography.

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

The performances given in this European Standard which illustrate suitability for use, are required for every type of external blind (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 prEN 14500 and prEN 14501 in the process of preparation and deal with important subjects such as thermal comfort, i.e.:

- solar factor;
- shading factor;
- direct solar transmittance;
- secondary heat transfert factor;
- solar radiation reduction factor.

and visual comfort, i.e.:

- light control;
- night privacy;
- visual contact with the outside;
- glare control;
- rendering of colours.

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 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 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 shall fulfil when fitted to a building. It deals also with the significant hazards for construction, transport, installation, operation and maintenance of the external blinds (see list of significant machine hazards in annex B).

It applies to all external blinds 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, marquisolette, façade awning, skylight awning, conservatory awning, Dutch awning, insect screen;
- solar screen.

This European Standard does not cover the wind resistance of fixed nor semi-fixed products, e.g. Dutch awnings, fixed or mobile and solar screen. They are not exempt from wind resistance requirements although no test methods have been established at the present time.

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).

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

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 1670, Building hardware – Corrosion resistance – Requirements and test methods.
EN 1932, 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.
EN 12194, Shutters, external and internal blinds – Misuse – Test methods.
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 13561:2004 (E)


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

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

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

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

3.5 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
3.6 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).

3.7 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

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

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

3.10 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

3.11 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)

3.12 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

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

4 Wind resistance

4.1 General
Under the action of wind, resulting in positive or negative pressure, the blind shall not:

a) under the nominal load \( F_N \), sustain deformation or deterioration which is detrimental to its correct operation;

b) under the safety load \( F_S \), cause safety hazard, e.g. be dislodged from its guiding tracks in the case of guided blinds.

4.2 Determination
Shall be in accordance with the test methods specified in EN 1932.
4.3 Performance requirement

4.3.1 General

According to the type of blind, the performance criteria as specified in Tables 1 to 5 shall be met under the action of the nominal load $F_N$ and the safety load $F_S$.

4.3.2 Nominal load $F_N$

The nominal load $F_N$ is specified as follows:

$$ F_N = \beta \times p \times L \times H $$  \hspace{1cm} (1)

where

- $L$, $H$ is the width and height of blind as specified in EN 1932.
- $p$ is the threshold value of wind test pressure in N/m$^2$ corresponding to the class of wind resistance under consideration (see 4.4).
- $\beta$ is the conversion of the effect of distributed loading relative to those of test loads. It depends on the type of awning (see Tables 1 to 5).
  - $\beta = 0.5$ in the case of folding arm awning, trellis arm awning, projecting awning and marquisolette (see Tables 1 to 3).
  - $\beta = 1$ in the case of blind with lateral guiderail with or without tension system (see Tables 4 and 5).

4.3.3 Safety load $F_S$

For folding arm awning, trellis arm awning, pivot arm awning and marquisolette, a test shall be carried out using a safety load $F_S$, 20% greater than the nominal load $F_N$, and for which no rupture of the product shall occur.

$$ F_S = \gamma \times F_N \text{ with } \gamma = 1.20 $$  \hspace{1cm} (2)

The value $\gamma$ of 1.20 is judged to be representative of the extra load that the product shall be able to support between the appearance of allowable residual deformations (under the nominal load) and the risk of breaking. It takes into consideration that a retractable external blind is not supposed to be extended permanently and shall be retracted if the wind speed becomes higher than the value stated in the technical instructions of the manufacturer corresponding to the class of wind resistance of the blind.

Tables 1 to 5 give, for the different blinds, the sequences of loading and the corresponding performances criterias required.
### Table 1 — Folding and trellis arm awnings — Performance criteria

<table>
<thead>
<tr>
<th>LOAD</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F_N = \beta \times p \times L \times H$ ($\beta = 0.5$)</td>
<td><strong>Sequences</strong></td>
</tr>
</tbody>
</table>

#### 1 Set in horizontal position
(tolerance ± 5°)

#### 2 Extension at ½ H
load ½ $F_N$

#### 3 Extension at H
Measure of reference $Z_{l0}$, $Z_{r0}$
(see Table 2)

#### 4 Direct nominal load $F_N$

#### 5 Inversed nominal load -$F_N$

<table>
<thead>
<tr>
<th></th>
<th>residual vertical movement allowed after releasing load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>$(Z_{l1} - Z_{l0}) - (Z_{r1} - Z_{r0}) \leq 1 % L$</td>
</tr>
</tbody>
</table>

Then load released

manual operating effort maintained inside the class for folding arm awning with box, correct closing of box shall be ensured
Table 1 — Folding and trellis arm awnings — Performance criteria (concluded)

<table>
<thead>
<tr>
<th>LOAD</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN = β x p x L x H (β = 0.5)</td>
<td>Sequences</td>
</tr>
<tr>
<td>6</td>
<td>Safety load</td>
</tr>
<tr>
<td>FS = 1.2 x FN</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 — Folding and trellis arm awnings — Measurement of reference for sequence 3

| Plane of reference | Zl ; Zr : vertical distances taken from the front profile to the horizontal plane of reference at the connection points |
| Zl0 ; Zr0 : measurement of the reference before loading (sequence 3) |
| Zl1 ; Zr1 : measurement after load is released (sequence 4) |
| Zl2 ; Zr2 : distances measured after load is released (sequence 5) |
Table 3 — Projecting awning and marquisolette — Performance criteria

<table>
<thead>
<tr>
<th>LOAD</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_N = \beta \times p \times L \times H ) or ( F_N = \beta \times p \times L \times (H1 + H2) ) ( (\beta = 0.5) )</td>
<td></td>
</tr>
<tr>
<td><strong>Sequences</strong></td>
<td><strong>Appearance</strong></td>
</tr>
<tr>
<td>1 Direct nominal load ( F_N )</td>
<td>no onset of tearing</td>
</tr>
<tr>
<td></td>
<td>no localised splitting of seams</td>
</tr>
<tr>
<td>Then load released</td>
<td></td>
</tr>
<tr>
<td>2 Inverse nominal load (-F_N) (blinds with obstructed articulation)</td>
<td>residual movement allowed after release of load</td>
</tr>
<tr>
<td></td>
<td>(</td>
</tr>
<tr>
<td></td>
<td>(</td>
</tr>
<tr>
<td></td>
<td>(</td>
</tr>
<tr>
<td>Then load released</td>
<td></td>
</tr>
<tr>
<td>( x ) obstruction</td>
<td></td>
</tr>
<tr>
<td>3 Direct safety load ( F_S = 1.2 \times F_N )</td>
<td>no tearing</td>
</tr>
<tr>
<td>( \frac{1}{2} F_S )</td>
<td></td>
</tr>
<tr>
<td>( \frac{1}{2} F_S )</td>
<td></td>
</tr>
<tr>
<td>4 Inverse safety load ( \text{blocked articulation blinds) ) (-F_S = -1.2 \times F_N)</td>
<td>no tearing</td>
</tr>
<tr>
<td>( \frac{1}{2} F_S )</td>
<td></td>
</tr>
<tr>
<td>( \frac{1}{2} F_S )</td>
<td></td>
</tr>
<tr>
<td>( x ) obstruction</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 — Blind with lateral guiderail without tension system \(^3\) — Performance criteria

<table>
<thead>
<tr>
<th>LOAD</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_N = \beta \times p \times L \times N ) ((\beta = 1))</td>
<td>Appearance</td>
</tr>
<tr>
<td>Sequences</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Direct nominal load ( F_N )</td>
</tr>
<tr>
<td></td>
<td>Then load released ( x ) obstruction</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lifting of front profile by ( \frac{1}{3} H )</td>
</tr>
<tr>
<td></td>
<td>Alternately block one side and release the other side</td>
</tr>
<tr>
<td></td>
<td>( x ) obstruction</td>
</tr>
</tbody>
</table>

* Vertical roller blind, conservatory and façade blind.
Table 5 — Blind with lateral guiderail with tension system \(^a\) — Performance criteria

<table>
<thead>
<tr>
<th>LOAD</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_N = \beta \times p \times L \times H ) ((\beta = 1)) (H = \text{greatest available height})</td>
<td>Appearance</td>
</tr>
<tr>
<td>Sequences</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Direct nominal load (F_N)</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2} F_N)</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2} F_N)</td>
</tr>
<tr>
<td></td>
<td>(F_H)</td>
</tr>
<tr>
<td>Then load released</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Raise test bar with (F_N), releasing one end of the test bar alternatively.</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2} F_N)</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{2} F_N)</td>
</tr>
<tr>
<td></td>
<td>(F_H)</td>
</tr>
</tbody>
</table>

\(^a\) Facade awning, rooflight awning, verandah awning or conservatory awning.

4.4 Classes of wind resistance

The classes of wind resistance are given by the threshold values of nominal test pressure \(p\), specified in Table 6;

Table 6 — Classes of wind resistance

<table>
<thead>
<tr>
<th>Classes</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal test pressure (p) (N/m(^2))</td>
<td>&lt; 40</td>
<td>40</td>
<td>70</td>
<td>110</td>
</tr>
<tr>
<td>Safety test pressure (1,2 p) (N/m(^2))</td>
<td>&lt; 48</td>
<td>48</td>
<td>84</td>
<td>132</td>
</tr>
</tbody>
</table>

NOTE 1 The classes may be expressed according to the Beaufort scale.

<table>
<thead>
<tr>
<th>Beaufort scale</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V) (km/h) (maximum values)</td>
<td>28</td>
<td>38</td>
<td>49</td>
</tr>
<tr>
<td>(p) (N/m(^2))</td>
<td>40</td>
<td>70</td>
<td>110</td>
</tr>
</tbody>
</table>

NOTE 2 Class 0 corresponds to either performance not required or not declared or a product that does not fulfill the requirements of class 1.
NOTE 3 The test pressure $p$ is linked to the dynamic pressure $q$ due to the wind to be considered by the following relation.

$$p = \alpha q \quad \text{with} \quad \alpha = C_{pe} - C_{pi}$$

and

$C_{pe}$ is the pressure coefficient on external face of blind.

$C_{pi}$ is the pressure coefficient on internal face of blind.

The coefficient $\alpha$ depends on the type of product and its position.

For folding arm awnings, $\alpha = 0.6$

NOTE 4 For folding blinds, the maximum dynamic pressure $q$ under consideration corresponds to the maximum wind speed compatible with the extended position of the blind.

NOTE 5 The conditions to be met in order to fulfill the performance requirement are defined for static loads and do not consider the dynamic effect of repeated loads to which the fabric and the arms are submitted in a real situation. For these reasons, class 2 or class 3 is a general recommendation.

5 Resistance to water pocket

5.1 General

This applies to folding arm awning, trellis arm awning and Dutch awning.

Under the action of precipitation, the external blind is susceptible to the retention of water forming a pocket of water and shall withstand the corresponding load.

5.2 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 lesser incline specified by the manufacturer), the fully extended blind shall withstand the force 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 force shall be maintained inside the class.

The instructions for use supplied by the manufacturer will remind of the necessity of retracting the folding arm awning in the instance 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 7.

<table>
<thead>
<tr>
<th>TABLE 7</th>
<th>Resistance to water pocket</th>
<th>Performance classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASSES</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Flow</td>
<td>17 l/m²×h</td>
<td>56 l/m²×h</td>
</tr>
</tbody>
</table>

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 regulations existing in individual countries, products concerned in this standard are not designed to withstand snow load.
7 Operating effort

7.1 General

Does not apply for power operated products.

The effort $F_C$ necessary to set the curtain in motion in retraction or extension, and tilting the laths (for tilting louvre arrays) is a function of the type of operation.

7.2 Determination

Shall be in accordance with the test methods specified in EN 13527.

7.3 Performance requirement and operating effort classes

Operating effort $F_C$ shall not exceed the values in Table 8.

<table>
<thead>
<tr>
<th>TYPES OF OPERATION</th>
<th>$F_C$ N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 1</td>
</tr>
<tr>
<td>Crank or winch handle $^a$</td>
<td>30</td>
</tr>
<tr>
<td>Belt, cord or chain $^{a,b}$</td>
<td>90</td>
</tr>
<tr>
<td>Rod, hand</td>
<td>vertical plane</td>
</tr>
<tr>
<td></td>
<td>horizontal or sloping plane</td>
</tr>
</tbody>
</table>

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 moving the blind and tilting the laths belong to class 2. Otherwise the blind is class 1.

$^a$ Operation mechanism shall also fulfill the requirements in clause 9.

$^b$ One direction movement and endless movement of the operating mechanism.

Particular case for folding arm awning (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 force, needed during the rest of travel (retraction and extension).

The maximum values for $F_C$ are given in Table 9.

<table>
<thead>
<tr>
<th>CRANK HANDLE OPERATION</th>
<th>$F_C = {F_{CP}, F_{CN}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 1</td>
</tr>
<tr>
<td></td>
<td>${90, 30}$</td>
</tr>
</tbody>
</table>

NOTE Class 3 and class 4 characterize operations without peak force.
Figure 1 — Folding arm awning — Characterization of a class of operating force with peak

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

8.1 General

Geometrical characteristics of operating mechanisms taking into account the comfort of the operation.

8.2 Performance requirement

Gear operation

Gear with crank or winch handle shall have:

- a handle R of length less or equal to 0,20 m (R ≤ 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

Operating mechanisms shall have minimal dimensions as given in the HPV diagrams (see Figures 2 and 3).
Apparent cord diameter for HPV for n cords with diameter d

d is the diameter of a single cord

<table>
<thead>
<tr>
<th>n</th>
<th>d_{HPV}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>d</td>
</tr>
<tr>
<td>2</td>
<td>1.5d</td>
</tr>
<tr>
<td>3</td>
<td>2d</td>
</tr>
<tr>
<td>4</td>
<td>2.4d</td>
</tr>
<tr>
<td>5</td>
<td>2.7d</td>
</tr>
<tr>
<td>6</td>
<td>3d</td>
</tr>
</tbody>
</table>

**Key**
1 Acceptable
2 Non acceptable
3 Operating effort

**Figure 2 — Diagrams HPV for cord or chain operation**

**Figure 3 — Diagram HPV for belt operation**
9 Misuse

9.1 Curtain and slats – General

9.1.1 General requirement

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 as defined in Tables 1 to 5.

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

9.1.2 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.

![Diagram of forced operations]

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 have to 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 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.

**9.1.3 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.

**9.2 Determination**

Shall be in accordance with the test methods specified in EN 12194.

**9.3 Performance requirement**

On completion of each of the tests, using rough, forced and reversed operations, with the values given in Table 10:

- there shall be no visible defects: no onset of tearing the fabric, no splitting of seams, no permanent damage to front profile or guiderails;

- and, for manual operation, the value of operating effort shall be maintained within the limit of the initial class.

Certain products are not designed to withstand obstruction of the curtain in situations a2, b1, c1 and c2 illustrated at Figure 4. They will not be subjected to the corresponding tests if the technical instructions of the manufacturer have a warning for the user of the risk of damage when the curtain is obstructed in these situations.

The manufacturer shall ensure his installation instructions emphasise that the operating procedures shall be provided to the end user.
### Table 10 — Misuse values relative to the type of operation

<table>
<thead>
<tr>
<th>Effort of misuse operation</th>
<th>Misuse operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force ( N )</td>
<td>Torque ( N \times m )</td>
</tr>
<tr>
<td>( P_B = 2 F_C )</td>
<td>( C_B )</td>
</tr>
<tr>
<td>Movement of curtain / Tilting of laths</td>
<td>rough</td>
</tr>
<tr>
<td>( P_F = 180 )</td>
<td>( C_F = 60 \times R^b )</td>
</tr>
<tr>
<td>( P_I \leq F_C )</td>
<td>( C_I \leq F_C \times R )</td>
</tr>
</tbody>
</table>

\( F_C = \) value of operating effort of class obtained

\( P = \) exerted misuse force

\( C = \) exerted misuse torque

\( R = \) maximum length of crank handle described in the technical instructions of the manufacturer with \( R \leq 0.20 \text{ m} \)

\(^a\) Operation by gear is never rough.

\(^b\) In the case of folding arm awning, \( C_F = 120 \times R \) in situations a1 and b2 of Figure 3.

\(^c\) If the operating mechanism is equipped with a system which limits the force or the torque (see clause 11), the values of \( P_F \) and \( C_F \) are those given by this system.

\(^d\) For power operated operations, the effort to be applied is that produced by the motor.

**NOTE** There are no performance classes.

### 10 Mechanical endurance (repeated operation cycles)

#### 10.1 General

Ability of the external blind to withstand a number of operating cycles corresponding to a given usage:

- the curtain: one cycle corresponds to a complete operation of extension and retraction including the rest times;
- the laths: one tilt cycle is defined as a complete movement of the pivoting mechanism, moving the slats or vanes from one extreme position to the other and then back again.

#### 10.2 Determination

Shall be in accordance with the test methods specified in EN 14201.

#### 10.3 Performance requirement

##### 10.3.1 General

After carrying out the cycles relating to the appropriate class, the following requirements shall be fulfilled.

##### 10.3.2 Manual operation

- The value of operating effort shall be maintained within the limit of the initial class. For folding arm awning with box, correct closing of box shall be ensured;
- Appearance criteria shall be fulfilled (no onset of tearing of fabric, no splitting of seams, no permanent damage to front profile or guiderails);
- Operating mechanisms shall not sustain significant damage.
10.3.3  Power operated operation

* Variation of the speed under load

The ratio \( \frac{|T_1 - T_2|}{T_1} \times 100 \) shall be less or equal to 20 %

\[ \text{(5)} \]

where

\( T_1 \) is the time taken for full retraction of the curtain, measured at the beginning of the endurance test, after five cycles of functioning.

\( T_2 \) is the time taken for full retraction of the curtain measured at the end of the endurance test.

* Accuracy of the positions of limit stops

The variation of the fully retraced and fully extended positions, measured in the two rotation directions and expressed as an angle in relation to the initial value, shall remain in the range of values given in Table 11.

<table>
<thead>
<tr>
<th>Motorization type</th>
<th>Limit stops drift</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 1</td>
</tr>
<tr>
<td>Tubular</td>
<td>± 15°</td>
</tr>
<tr>
<td>Square</td>
<td>± 10°</td>
</tr>
</tbody>
</table>

* Characteristics of the mechanical brake

- Stopping the movement of the curtain shall not lead to an angular displacement more than 20°.
- The displacement of the front profile, after applying an overload of 15% of the weight of the curtain, shall not exceed 5 mm, the measurement from the intermediate position carried out after 12 h.

NOTE  A mechanical brake is a brake applied mechanically by stored energy (spring force) until released with an external sustained electrical power supply under the control of the operator or automatically.

* Grease and oil traces

There shall be no visible traces of grease and oil.

10.4  Classes of endurance

Table 12 gives the endurance cycles corresponding to the three endurance classes specified.

<table>
<thead>
<tr>
<th>Number of cycles</th>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension / retraction</td>
<td>3 000</td>
<td>7 000</td>
<td>10 000</td>
</tr>
<tr>
<td>Tilting</td>
<td>6 000</td>
<td>14 000</td>
<td>20 000</td>
</tr>
</tbody>
</table>

NOTE  Class 2 corresponds to 10 years use with 2 cycles per day.
11 Operation in frosty conditions

The technical instructions of the manufacturer shall state whether or not the product can be operated in frosty conditions (in case of formation of ice) and if not, the product shall have a warning: "The operation in frosty conditions may damage the awning".

12 Safety in use

12.1 General

The significant machinery hazards dealt with are listed in annex B.

12.2 Falling of persons

12.2.1 General

In the case of multiple occupancy buildings with projecting awnings, an automatic activation (sun, clock, anemometer, etc.) shall not endanger and create the risk of persons falling if working on a facade.

12.2.2 Determination

The requirement in 12.2.3 shall be fulfilled.

12.2.3 Safety requirement

A supervised control priority locking device shall be capable of preventing all operation.

12.3 Protection against potentially harmful components

12.3.1 General

Contact between the user and the product and its parts shall not cause injury.

12.3.2 Determination

The requirements in 12.3.3 shall be fulfilled.

12.3.3 Safety requirement

Components likely to come into contact with passers-by and users, shall not present any sharp or projecting edges, likely to cause injury.

Any moving parts of the awning structure likely to be located at a height lower than 2,50 m above floor or any permanent access level, shall be rounded with a minimum radius of 0,5 mm. Front profile end plugs shall have a minimum of 0,5 mm radius, or be edged or protected by foam or rubber.

12.4 Guided power operated awnings — Injurious contacts in operation

12.4.1 General

Crushing and shearing hazards shall be eliminated or reduced.

12.4.2 Determination

The requirements in 12.4.3 shall be fulfilled, and where appropriate, in accordance with the test methods specified in EN 12045.
12.4.3 Safety requirement

12.4.3.1 Protection of shearing areas of conservatory awnings

The shearing areas in question are essentially those existing with conservatory awnings when the front profile passes over each guiding roller (see Figure 5).

![Figure 5 — Conservatory awning — Shearing area defined by the passage of the front profile at each guiding roller](image)

The requirement is met if, at least, one of the following conditions is present:

a) The front profile moves only by gravity with a mass less than 15 kg;

b) The transmitted force (operating force) of the front profile is less than 150 N and its speed is less than 0.20 m/s:

\[ F < 150 \text{ N and } V < 0.20 \text{ m/s}; \]

c) The distance between the front profile and a guiding roller or any associated fixed obstacle is equal or greater than 0.07 m:

\[ e \geq 0.07 \text{ m}; \]

d) The conservatory awning has a hold-to-run control and the switch is incorporated in the product or installed, in such a way that it allows the control in the direct view of the front profile. In that last case, it shall be mentioned in the installation instructions;

e) The shearing area is found at a distance Z more than or equal to 2.50 m from the floor or from any other permanent access level:
EN 13561:2004 (E)

\[ Z \geq 2.50 \text{ m}; \]

f) The conservatory awning is equipped with a safety device which:

- either prevents contact in the crushing area (guards);
- or limits the transmitted force to a value lower than 150 N and allows removal of the obstacle either by reversing the movement of the front profile or by stopping it. With that last solution, it shall be possible to lift up the front profile with a force less than 25 N.

Guards designed to protect from the mobile elements of transmission shall be fixed in such a way that they can be only dismounted with the use of a tool.

### 12.4.3.2 Protection in the crushing area of guided awnings

The requirement is fulfilled if, at least, one of the following conditions is present:

a) The front profile moves only by gravity with a mass less than 15 kg;

b) The transmitted force (operating force) of the front profile is less than 150 N and its speed is less than 0.20 m/s:

\[ F < 150 \text{ N and } V < 0.20 \text{ m/s}; \]

c) The front profile is at least 0.40 m from a fixed object;

d) The awning has a hold-to-run control and the switch is incorporated in the product or installed on site, in such a way that it allows the control in the direct view of the front profile. In that last case, it shall be mentioned in the installation instructions;

e) The front profile is found at a distance Z greater than or equal to 2.50 m from the floor or from any other permanent access level:

\[ Z \geq 2.50 \text{ m}; \]

f) The awning is equipped with a safety device which:

- either prevents contact in the crushing area (guards);
- or limits the transmitted force to a value lower than 150 N and allows removal of the obstacle either by reversing the movement of the front profile or by stopping it. With the last solution, it shall be possible to lift up the front profile with a force less than 25 N.

Guards designed to protect from the mobile elements of transmission shall be fixed in such a way that they can be only dismounted with the use of a tool.

### 12.5 Electric hazards

The electric drives shall conform to EN 60335-1 and EN 60335-2-97.

### 13 Hygiene, health and environment

#### 13.1 General

Under the action of external environmental conditions, the fabric shall not encourage the growth of micro-organisms.

#### 13.2 Determination

There is no test relating to this requirement.
13.3 Performance requirement

Textile fibres which are not naturally resistant to fungus/mildew shall be treated according to the latest scientific developments.

Materials in products shall not release any dangerous substances in excess of the maximum levels specified in the European material Standards and any national regulations. For more information, consult the Construction web site on EUROPA (CREATE, accessed through http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm).

14 Thermal resistance

14.1 General

The installation of a vertical awning in front of a glazing in the extended and closed position, produces an additional thermal resistance $\Delta R$ in [m$^2$K/W] which depends on the thickness and peripheral ventilation gaps of the air layer between the glazing and the external blind.

14.2 Determination

Shall be in accordance with the method of calculation as specified in EN ISO 10077-1.

14.3 Performance requirement

The allocation of a class of thermal resistance to an external blind is given according to the air permeability as specified in EN 13125.

15 Durability

15.1 General

Ability of constituent materials of the product to fulfil the following requirements during an economically reasonable service life:

- colour fastness;
- no degradation of appearance;
- resistance to breakage;
- resistance to corrosion;
- dimensional stability.

Table 13 states the requirements demanded of the different materials used:

<table>
<thead>
<tr>
<th>Requirements asked for each type of material</th>
</tr>
</thead>
<tbody>
<tr>
<td>material</td>
</tr>
<tr>
<td>fabric</td>
</tr>
<tr>
<td>metal</td>
</tr>
</tbody>
</table>

Only the requirements described by a ■ are covered by this standard.

The requirements with a □ will be the subject of further developments.
Selected criteria are linked to the test methods described in 15.2 and 15.3. They specify the minimum quality of characteristics to be fulfilled by the materials.

15.2 Fabric

15.2.1 General

With reference to the initial state, performances shall be estimated after 1 000 h exposure to weathering agents according to EN ISO 105-B04.

15.2.2 Colour fastness

The grey scale according to EN 20105-A02 shall be at least at level 4.

15.2.3 Tensile resistance

- The minimale tensile resistance carried out according to EN ISO 1421 (on strip of 5 cm wide) shall be:
  - warp  100 daN
  - weft  60 daN

- The reduction of resistance shall not be more than 20 % relative to the initial state.

15.2.4 Dimensional stability

- Stability under weathering agents : dimensional variations shall be between the following limits:
  - warp  [-3 % , +1 %]
  - weft  [-1 % , +1 %]

- Residual deformations after traction application : dimensional variations measured after 24 h loading 250 N on 100 mm, on sample 100 mm × 1 200 mm, warp way and weft according to annex A. shall be within the following limits:
  - Total change in length under load:
    - warp  \( \leq 12 \text{ mm} \)
    - weft  \( \leq 41 \text{ mm} \)
  - Residual length, load released:
    - warp  \( \leq 1 \text{ mm} \)
    - weft  \( \leq 16 \text{ mm} \)
  - Residual width, load released:
    - warp  0 mm
    - weft  0 mm

15.2.5 Resistance to water penetration:

Resistance to water penetration (Schopper test) shall be measured according to EN 20811. Stitches are not concerned.

A new measurement is taken after simulation of effect of repeated showers.
The sample is immersed during 24 h in demineralized water, changed completely every 3 h.

The reduction of the resistance to water penetration shall not be more than 15 %.

15.3 Metals

Requirements and classes for resistance to corrosion shall be in accordance with EN 1670, except that the salt spray test according to ISO 9227 shall be carried out:

– either on the different components and profiles used in the product, not assembled;

– or on a complete small scale sample of blind (minimum size 700 mm × 700 mm).

The classes of resistance to corrosion and the corresponding coatings shall be as specified in Table 14 according to the environmental destination of the product.

<table>
<thead>
<tr>
<th>Classes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor components</td>
<td>24 h</td>
<td>48 h</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Outdoor components</td>
<td>---</td>
<td>48 h</td>
<td>96 h</td>
<td>240 h</td>
</tr>
</tbody>
</table>

When outdoor components are required to be class 4, indoor components shall be at least class 2.

16 Appearance performances

16.1 Form tolerances

Not applicable.

16.2 Dimensional tolerances

16.2.1 General

Tolerances relative to the overall dimensions (height and width) of the product delivered compared to the ordered dimensions.

16.2.2 Determination

The delivered dimensions shall take into account the geometry of the opening (where the product is to be installed) and the customer specifications.

The covered surface area of the fabric will be given in the technical instructions of the manufacturer.

16.2.3 Performance requirement

The finished width L and height H shall fall within the tolerances listed in Tables 15 and 16, taken at the temperature of 23 °C ± 5 °C.

<table>
<thead>
<tr>
<th>Width L (m)</th>
<th>Tolerances (mm)</th>
<th>Height H (m)</th>
<th>Tolerances (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L ≤ 2</td>
<td>+0</td>
<td>H ≤ 1,5</td>
<td>+2</td>
</tr>
<tr>
<td></td>
<td>−3</td>
<td></td>
<td>−2</td>
</tr>
<tr>
<td>2 &lt; L ≤ 4</td>
<td>+0</td>
<td>1,5 &lt; H ≤ 2,5</td>
<td>+3</td>
</tr>
<tr>
<td></td>
<td>−4</td>
<td></td>
<td>−3</td>
</tr>
<tr>
<td>L &gt; 4</td>
<td>+0</td>
<td>H &gt; 2,5</td>
<td>+4</td>
</tr>
<tr>
<td></td>
<td>−5</td>
<td></td>
<td>−4</td>
</tr>
</tbody>
</table>
Table 16 — Projecting awning — Dimensional tolerances

<table>
<thead>
<tr>
<th>Width L (m)</th>
<th>Tolerances (mm)</th>
<th>Sloping projection H (m)</th>
<th>Tolerances (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L ≤ 6</td>
<td>± 10</td>
<td>All H</td>
<td>± 40</td>
</tr>
<tr>
<td>6 &lt; L ≤ 12</td>
<td>± 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 &lt; L ≤ 18</td>
<td>± 30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17 Handling and storage

17.1 General

Requirements concerning, storage, packaging, handling and delivery of products.

17.2 Determination

The requirements in 17.3 shall be fulfilled.

17.3 Performance requirement

The blind or each of its components shall be:

− able to be handled in a safe manner;

NOTE Whenever possible, in case of manual handling, the mass per person should be not more than 25 kg.

− wrapped or designed to ensure safe storage without deterioration.

Any special equipment for assembly, fixing and setting e.g. appropriate fixing brackets shall be provided.

Particular precautions shall be taken for all devices having potential energy stored capable to free violently when positioning. Thus, in the case of folding arm awnings, the arms and frameworks delivered without fabric, shall be so packaged that they cannot extend suddenly when unpacking, while the installer shall be warned of the danger by appropriate means (see 18.2).

18 Information for use

18.1 General

Information for use has to be provided according to EN ISO 12100-2:2003, clause 5 with the additional requirements formulated in the present clause.

18.2 Signal and warning devices

A warning device consisting for example, of the general danger warning pictogram according to EN 61310-1, with the supplementary label giving text information in the following sense “The operator’s instruction shall be read before the use of the product”, shall be attached to the arms of folding arm awning.

Likewise, a general danger warning pictogram, with a supplementary label “The operator’s instruction shall be read before the use of the product”, shall be attached to the technical instructions, illustrating very clearly the situations where forced operation can damage the product.

18.3 Accompanying documents (in particular the instruction handbook)

18.3.1 General

Written instructions shall be provided in accordance with EN ISO 12100-2:2003, clause 5. The following specific informations shall be included in these instructions.
18.3.2 Instructions for handling, unpacking and installation

18.3.2.1 General instructions

The instructions shall include a repeat of the instructions with which the product is marked.

The instructions shall clearly state when the procedure specified can be completed by non-professionals.

The instructions shall include step by step, guidance on the correct sequence of operations to achieve a proper good and safe installation:

- Instructions for assembly, installation and fixing;
- the assembly phases;
- any special requirements for storage;
- the methods for safe handling of the blind and its components, in particular for products delivered in items with high unit mass.

18.3.2.2 Additional instructions for power operated products

The instructions shall include diagrams, drawings, etc., wherever necessary to give clarity to the instructions (specially when a wrong connection can be the cause of risks).

The information on the operations to be carried out to programme an electronic switch or a clock shall be given in a clear manner.

The instruction handbook shall draw the attention of the installer to the fact that modification of the design or configuration of the equipment shall not be made without consulting the manufacturer or his authorized representative.

The instructions for external blinds controlled by an hold-to-run switch shall state that the switch is to be installed within sight of movement of the front profile but away from moving parts at a height in accordance with the national regulations concerning disabled people (preferably less than 1,30 m where possible).

If a manual release is provided, the instructions shall state that the actuating member is to be accessible from a height less than 1,80 m.

In the case of installation in a windy area and with frequent power failures, the supplier will recommend a manual override device or a substitute power supply.

When use of the product can result in a dangerous situation the necessary information concerning the operation shall be stated without ambiguity and detailed in the operating instructions.

18.3.3 Instructions for use and maintenance

18.3.3.1 General instructions

The instructions for use shall include the duties and conditions under which the awning has to be used, in particular with regard to:

- correct methods for operating the awning;
- explanation of the warning signs.

When use of the product can result in a dangerous situation the necessary information concerning the operation shall be stated without ambiguity and detailed in the operating instructions.

The manufacturer shall inform the installer of the need to arrange a servicing of the product to ensure maintenance of the product itself or neighbouring elements.
The manufacturer shall clearly indicate the items needing replacement, maintenance or verification and the frequency.

18.3.3.2 Additional specifications for power operated products

The instructions for use and maintenance shall state the substance of the followings:

**IMPORTANT SAFETY INSTRUCTIONS**

**WARNING – IT IS IMPORTANT FOR SAFETY OF PERSONS TO FOLLOW THESE INSTRUCTIONS**

**SAVE THESE INSTRUCTIONS**

The instructions shall include the substance of the following:

- Do not allow children to play with the control device of the blind. Keep remote control away from children;
- Frequently examine the installation for signs of wear or damage to cables. Do not use if repair is necessary.

The information on the operations to be carried out to programme an electronic switch or a clock shall be given in a clear manner.

The instructions shall give details on how to use the manual release, if applicable, and the substance of the following:

- Take care when operating the manual release with the external blind retracted since it may fall rapidly due to weak or broken springs.

For external blinds, which can be operated from a position without view on the blind, the user shall take appropriate organisational measures for preventing operation of the blind when maintenance, such as window or wall cleaning, is being carried out in the vicinity.

For an inspection or maintenance of the electrical parts, the external blind shall be disconnected from the energy supply in a reliable way.

If the awning is equipped with a safety device, the instruction handbook shall draw the attention of the user on the fact that modification of the design or configuration of the equipment without consulting the manufacturer or his authorized representative may create a dangerous situation.

The instructions for use and the technical documentation describing power operated external blinds shall give information on the A-weighted emission sound pressure level at the operator’s position as required by 1.7.4 f) in annex A of EN ISO 12100-2:2003.

**NOTE** Noise emission of power operated external blinds is not considered to be a significant hazard and is definitively a comfort aspect. However 1.7.4 f) of annex A of EN ISO 12100-2:2003 requires that the emission sound pressure level be given when this level is more than 70 dB(A) or, which will be generally the case, to indicate that this level is less than or equal to 70 dB(A).

18.4 Marking

The minimum marking shall include:

- name and address of the manufacturer;
- mandatory marking\(^1\);
- year of construction;

\(^1\) For power operated awnings and their related products intended to be put on the market in EEA, CE marking as defined in the European applicable directive(s).
— designation of series or type, if any;
— serial or identification number, if any;
— rating information (mandatory for electrical products voltage, frequency, power, etc.).

19 Evaluation of conformity

19.1 General

The compliance of an external blind with the requirements of this European Standard (the declared value of technical class of wind resistance) shall be demonstrated by:

– Initial type test according to 19.2;
– Factory Production Control (FPC) according to 19.3.

The specific safety requirements for power operated guided awnings contain self-evident methods and criteria for verification.

19.2 Initial type testing

An initial type test on wind resistance shall be carried out by the manufacturer at the beginning of a new awning type or at the beginning of a new method of production or when raw materials or components are changed (when this may affect the wind resistance properties).

Sampling: as the choice of sample(s) shall conform to the requirements specified in EN 1932.

The results of all tests shall be recorded and held by the manufacturer for at least 5 years.

19.3 Factory Production Control (FPC)

19.3.1 General

The manufacturer shall establish document and maintain an FPC system to ensure that the products placed on the market conform with the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and the use of the results to control raw and other incoming materials or components, equipments, the production process and the product.

NOTE An FPC system conforming with the requirements of the relevant part(s) or EN ISO 9000, and specific to the requirements of this standard, may be considered to satisfy the above requirements.

The results of inspections, tests, requiring action, shall be recorded, as well any action taken. The action to be taken when control values or criteria are not met shall be recorded.

19.3.2 Equipment

All weighing, measuring and testing equipments shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

19.3.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as well as the inspection scheme for insuring their conformity.

19.3.4 Design process

The Factory Production Control system shall document the various stages in the design of products, identify the checking procedure and those individuals responsible for all stages of design.
During the design process itself, a record shall be kept of all checks, their results, and any corrections actions taken. This record shall be sufficiently detailed and accurate to demonstrate that all stages of the design phase, and all checks, have been carried out satisfactorily.

19.3.5 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the characteristic of resistance to wind is maintained. The characteristic is the class of wind resistance.

19.3.6 FPC system documentation

The FPC system documentation shall address at least the following:

- definition of tasks and authorities;
- definition of the structure of the system documentation;
- specification and verification of raw materials and components;
- identification and traceability of products;
- documented procedures and instructions related to FPC;
- control of FPC related records;
- design control;
- identification of inspections and tests to be carried out;
- identification of necessary equipment for inspections and tests;
- treatment of non conforming products;
- carrying out corrective actions.
Annex A
(normative)

Fabrics — Determination of the elongation of awnings fabrics under a static load – Test method

A.1 Scope

This measuring method is to establish the behaviour of awnings fabrics during and after a static load. The measurement results permit statements to be made concerning the behaviour of awnings fabrics with respect to sagging and bagging during use.

During the determination of the test conditions, it was taken into account that even a slight elongation of the awnings fabric can lead significant problems during use.

A.2 Terms and definitions

For the purposes of this annex, the following terms and definitions apply.

A.2.1 measurement marks
marks made at defined intervals on the unstressed measure sample. The changes in distance between these marks are measured during testing

A.2.2 initial length $l_0$
distance $l_0$ between the two outer measuring marks and equal to $(1\ 000 \pm 1)$ mm

A.2.3 overall length $l_G$
distance $l_G$ between the measuring marks after $(24 \pm 0,25)$ h exposure to a force of $25\text{N/cm}$ sample width

A.2.4 residual length $l_R$
distance $l_R$ between the two outer measuring marks after sample loading and $(24 \pm 0,25)$ h recovery time in an unstressed state

A.2.5 total change in length $\Delta l_G$
difference $\Delta l_G$ between the overall length $l_G$ and the initial length $l_0$

$$\Delta l_G = l_G - l_0$$

A.2.6 change in residual length $\Delta l_R$
difference $\Delta l_R$ between the residual length $l_R$ and the initial length $l_0$

$$\Delta l_R = l_R - l_0$$

A.2.7 initial width $b_0$
sample width $b_0$ measured in the middle of the sample at the middle measuring mark and equal to $(100 \pm 0,05)$ mm

A.2.8 width under load $b_G$
sample width $b_G$ measured in the middle of the loaded sample at the middle measuring mark after $(24 \pm 0,25)$ h loading
A.2.9  
**residual width** $b_R$  
sample width $b_R$ measured in the middle of the unstressed sample at the middle measuring mark after $(24 \pm 0,25)$ h recovery time

A.2.10  
**change in width under load** $\Delta b_G$  
difference $\Delta b_G$ in between the width under load $b_G$ and the initial width $b_0$  
\[
\Delta b_G = b_G - b_0 \quad \text{The value is 0 or negative}
\]

A.2.11  
**change in residual width** $\Delta b_R$  
difference $\Delta b_R$ between the residual sample width $b_R$ and the initial width $b_0$  
\[
\Delta b_R = b_R - b_0 \quad \text{The value is 0 or negative}
\]

NOTE  
On account of the small changes in length recorded with this test method the stretch rate is not calculated so as to avoid misinterpretations of the very small stretch rates.

A.3  **Brief description**

Three measuring marks are made at fixed intervals across the width in the longitudinal direction of the sample and the initial length and initial width are then measured. The sample is then hung in a frame and stressed with a defined force by affixing a weight corresponding to the prescribed force at the lower end of the vertically suspended sample which is left to take effect on the sample for a specified period of time. At the end of the prescribed loading time, the overall length and the width under load are measured. The sample is relieved. At the end of the prescribed time, the residual length and residual width are measured.

A.4  **Equipment**

A.4.1  **Sample holder**

A frame to hold one or more samples shall be designed so that it is suitable for a load of 250 N or a multiple of 250 N. We recommend arranging spikes of around 120 mm in length as upper fixtures on which the samples can be suspended with a loop. The frame shall be at least 1 500 mm in height. The frame shall be placed on the ground to guarantee safety during testing.

A.4.2  **Weights**

A weight for the sample including clamping device of $(25 \pm 0,3)$ kg is required to achieve a force of 25 N/cm of sample width.

A.4.3  **Meter rule**

In order to determine the distance between two marks and the sample width, a meter rule with an accuracy of reading of 0,5 mm is required.

A.4.4  **Stop-watch**

The watch shall enable a reading of ± 10 s throughout the entire test period.

A.5  **Laboratory conditions**

The laboratory conditions for comparisons and testing shall be in accordance with EN 20139.

NOTE  
If measurements are carried out in unclimatised rooms the repeatability and comparability (between two different test centres) cannot be guaranteed. In such cases the temperature and relative humidity are to be recorded and noted in the test results.
A.6 Sampling

The samples are taken from the laboratory samples so that each sample has different warp yarns in the warp direction and different weft yarns in the weft direction. The long side of the samples shall be parallel to the warp yarns during testing in the warp direction and parallel to the weft yarns during testing in the weft direction. The minimum distance of the samples from the edges of the laboratory samples shall be 150 mm and from the top and bottom of the piece of fabric 300 mm.

A.7 Samples preparation

A.7.1 General comments

The measurements are performed on samples from both warp and weft directions.

A.7.2 Samples size

The size of the samples shall be as follows:

- Width: \((100 \pm 1)\) mm;
- Length: \((1200 \pm 1)\) mm.

The samples are to be cut from the laboratory samples along straight yarns.

A.7.3 Marking the samples

Three measuring marks are to be made at right angles to the length side across the entire width of the sample on the unstressed, relaxed and climatised sample, these being in the middle of the sample:

- \((500 \pm 0.5)\) mm to the right of the centre measuring mark;
- \((500 \pm 0.5)\) mm to the left of the centre measuring mark (see Figure A1).

The line for the measuring marks shall be of 1.0 mm wide.

A.7.4 Preparing the samples for testing

The clamping line for the samples shall be at least \((30 \pm 1)\) mm outside the outer measuring marks.

If using a sample holding frame we recommend sewing a loop at the top and bottom ends of the sample, whereby the distance between the seam and outer measuring mark shall be, in each case \((30 \pm 1)\) mm, i.e. from the centre measuring mark \((630 \pm 1)\) mm. The sample can then be hung by the loop on the spike of the sample holding frame. The load weight can be suspended from the second loop at the bottom.
A.8 Execution of testing

The initial length and initial width shall be measured to within 0,5 mm on the marked samples in an unstressed, relaxed and climatised condition.

The sample is then hung by one end with a loop on the spike of the sample holding frame. The load weight is then affixed to the lower end of the sample in such a way that no force is initially exerted on the sample.

The weight is then released quickly so that the sample is subjected to the full load within 5 s (avoiding any jerky loading).

The stop-watch is started at the same time as the loading. At the end of the loading time \((24 \pm 0,25)\) h, the distance between the two measuring marks is measured to within 0,5 mm (measurement of overall length). Immediately after this, the width is measured to within 0,5 mm at the centre measuring mark (width under loading).

The sample is then relieved, the loading weight removed and the sample left unstressed in the upper holder or removed from the frame and laid out unstressed on a table or similar.

At the end of the recovery time \((24 \pm 0,25)\) h, the residual length is measured by measuring the distance between the two outer measuring marks and immediately after this, the residual width is measured at the centre measuring mark. Both measured values are to be quoted to the nearest 0,5 mm.

NOTE The length measurement should be taken in the middle of both measuring marks.
During series measurements we recommend the simultaneous testing of a number of samples, whereby the stressing and relief of the samples shall be organised in succession so that an exact measurement of the samples under load and after recovery is guaranteed by the temporal offset.

Safety instruction: When working with loading weights take special precautions (e.g. wearing of safety gloves, not letting the loading weight fall from the sample) so as to avoid accidents.

A.9 Number of samples

At least three samples each are to be tested in the warp and weft directions. If statistical data other than the mean value are needed, the number of samples in each series of tests shall be at least five.

A.10 Evaluation of the measurement results

The initial length, overall length, residual length, total change in length, change in residual length, initial width, width under load, residual width, change in width under load and change in residual width are to be determined for each sample to the nearest 0.5 mm.

The mean value is calculated to the nearest 0.5 mm from the individual values for total change in length, change in residual length, change in width under load and change in residual width.

If other statistical data is required, the standard deviation to the nearest 0.5 mm, the confidence range for the mean value to the nearest 0.5 mm and the coefficient of variation to the nearest 0.1 % are determined for five individual values.

A.11 Test report

The test report shall include the following data:

11.1 General data
11.1.1 Reference to this test method and test date;
11.1.2 Identification of the sample and if necessary, description of the sampling;
11.1.3 Number of samples;
11.1.4 Laboratory conditions;
11.1.5 Any eventual deviation from the prescribed test method;
11.2 Test results
11.2.1 Mean value for the total change in length;
11.2.2 Mean value for the change in residual length;
11.2.3 Mean value for the change in width under load;
11.2.4 Mean value for the change in residual width;
11.2.5 If requested, standard deviation, confidence range for the mean value and coefficient for the parameters listed under 11.2.1 to 11.2.4.
Annex B  
(normative)

List of significant machine hazards

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this standard, identified by risk assessment as significant for powered operated awnings and which require action to eliminate or reduce the risk.

Table B.1 — Significant hazards

<table>
<thead>
<tr>
<th>N° from EN 1050:1996, annex A</th>
<th>Hazards</th>
<th>Relevant clause in this standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mechanical hazard due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) shape</td>
<td></td>
<td>12.3</td>
</tr>
<tr>
<td>e) inadequacy of mechanical strength</td>
<td></td>
<td>4, 5, 6, 9</td>
</tr>
<tr>
<td>f) accumulation of energy inside the machinery in elastic elements (springs)</td>
<td></td>
<td>17, 18</td>
</tr>
<tr>
<td>1.1 Hazardous situations of shearing</td>
<td></td>
<td>12.4.3.1, 18</td>
</tr>
<tr>
<td>1.2 Hazardous situations of crushing</td>
<td></td>
<td>12.4.3.2, 18</td>
</tr>
<tr>
<td>1.3 Cutting or severing hazard</td>
<td></td>
<td>12.3</td>
</tr>
<tr>
<td>2 Electric hazards due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Contact of persons with live parts (direct contact)</td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td>2.2 Contact of persons with live parts (indirect contact)</td>
<td></td>
<td>12.5, 18</td>
</tr>
<tr>
<td>7 Hazards generated by materials and products:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 Hazards resulting from contact or inhalation of fluids, gaz, etc.</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>8.1 Unhealthy postures or excessive effort</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>19 Slip, trip and fall of persons hazard</td>
<td></td>
<td>12.2, 18</td>
</tr>
</tbody>
</table>
Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of EU Construction Products Directive

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/101 “Doors windows, shutters, gates and building hardware” as amended by M/126 and M/130, given to CEN by the European Commission and the European Free Trade Association.

The relevant clauses of this European Standard shown in this Table ZA.1 meet the requirements of the Mandate given under the EU Construction Products Directive (89/106/CEE).

Compliance with these clauses confers a presumption of fitness of the construction products covered by this annex for their intended use indicated herein; reference shall be made to the information accompanying the CE marking.

**Warning:** Other requirements and other EU Directives, not affecting the fitness for intended use may be applicable to the construction products falling within the scope of this European Standard.

<table>
<thead>
<tr>
<th>Essential Characteristics</th>
<th>Requirement Clauses in this European Standard</th>
<th>Mandated levels and/or classes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance to wind load</td>
<td>4 – wind resistance</td>
<td>–</td>
<td>declared technical class(^a)</td>
</tr>
</tbody>
</table>

\(^a\) Declared class: pass/fail criteria in accordance with declared class.

This annex establishes the conditions for the CE marking of the external blinds intended for the uses indicated in Table ZA.1. and the relevant clauses applicable.

The scope of this annex is defined by Table ZA.1.

Table ZA.1 — Scope and relevant clauses

The requirement on the resistance to wind is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “no performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.
ZA.2 Procedure for the attestation of conformity

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of the external blinds indicated in Table Z.A.1, in accordance with the decision 1999/93/EC of 25 January 1999 of the Commission as given in the mandate for M/101 as amended by M/126 and M/130 is shown in Table Z.A.2 for the intended use and relevant level.

<table>
<thead>
<tr>
<th>Products</th>
<th>Intended use</th>
<th>Level/s or Class/es</th>
<th>Attestation of conformity system</th>
</tr>
</thead>
<tbody>
<tr>
<td>External blinds (with or without related hardware)</td>
<td>External use</td>
<td>—</td>
<td>4</td>
</tr>
</tbody>
</table>

System 4: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility (a) initial type-testing by the manufacturer, (b) factory production control.

The attestation of conformity of external blinds in Table Z.A.2 shall be according to the evaluation of conformity procedures indicated in Table Z.A.3 resulting from the application of the clauses of this European Standard indicated therein.

<table>
<thead>
<tr>
<th>Task for the manufacturer</th>
<th>Content of the task</th>
<th>Evaluation of conformity clauses to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory control production</td>
<td>Parameters related to all relevant characteristics of Table Z.A.1</td>
<td>19.3</td>
</tr>
<tr>
<td>Initial type testing</td>
<td>all relevant characteristics of Table Z.A.1</td>
<td>19.2</td>
</tr>
</tbody>
</table>

ZA.2.2 EC Declaration of Conformity

When compliance with this annex is achieved, the manufacturer or his agent established in the EEA, shall prepare and retain a declaration of conformity, which authorises the affixing of the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;

— description of the product (type, identification, use, etc.), and a copy of the information accompanying the CE marking;

— provisions to which the product conform (e.g. Annex Z.A.1 of this European Standard);

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);

— Name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

This above mentioned declaration and certificate shall be presented in the official language or languages of the Member State in which the product is to be used.
ZA.3 CE Marking and labelling

The manufacturer or his authorised representative established within the EU or EFTA is responsible for the affixing of the CE marking.

The CE conformity symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the product (see Figure ZA.1) together with the following information:

- name or identifying mark of the producer;
- registered address of the producer;
- reference to this European Standard.

In addition, the CE marking symbol shall also appear on the accompanying commercial documents (installation instructions or maintenance instructions or delivery ticket) (see Figure ZA.2), together with the following information:

- name or identifying mark of the producer;
- the last two digits of the year in which the marking is affixed;
- registered address of the producer;
- reference to this European Standard;
- product type- information on the relevant essential characteristics in Table ZA.1:
  - values and, where relevant, level or class to declare for each essential characteristic as indicated in "NOTES" in Table ZA.1;
  - characteristics against which the "No performance determined" (NPD) option is relevant.

The ‘No performance determined’ (NPD) option may not be used where the performance characteristic is subject to a threshold value. Otherwise, the NPD option may be used when and where the performance characteristic, for a given intended use, is not subject to regulatory requirements in the intended member state of destination.

Figures Z.A.1 and Z.A.2 give examples on the information to be given on the product and on the accompanying commercial documents.
Figure ZA.2 – Example of the information to be given on the commercial documents

| CE conformity marking, consisting of the CE symbol given in Directive 93/68/EEC |
| Name or identifying mark and registered address of the producer |
| Last two digits of year in which the marking was affixed |
| EN 13561 blind for external use |
| Description of product and information on regulated characteristics |

Any Co Ltd, PO Box 21, B-1050
01

Wind resistance: Technical class 2

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.
Annex ZB
(informative)

Relationship of this document with EC Directives

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 the following EU Directive(s):


All power operated external blinds fall in the scope of this European Directive.

Compliance to clauses 4, 5, 6, 9, 12, 13, 17 and 18 of this European Standard provides one means of conforming with the specific essential requirements of the Machinery Directive and associated EFTA regulations.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this document.
Bibliography


