BRITISH STANDARD

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12676-1:2000
Incorporating
Amendment No. 1

Anti-glare systems for roads —

Part 1: Performance and characteristics

The European Standard EN 12676-1:2000, with the incorporation of amendment A1:2003, has the status of a British Standard

ICS 93.080.30

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 12676-1:2000, including amendment A1:2003.

The start and finish of text introduced or altered by CEN amendment A1 is indicated in the text by tags ⟨A1⟩ ⟨A1⟩. Tags indicating changes to text carry the number of the amendment. For example, text altered by CEN amendment A1 is indicated by ⟨A1⟩ ⟨A1⟩.

In accordance with CEN amendment A1, the term "anti-glare systems" has been replaced by "anti-glare screens" throughout the document. These changes are not indicated in the text by tags.

The UK participation in its preparation was entrusted to Technical Committee B/509, Road equipment which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

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Anti-glare systems for roads - Part 1: Performance and characteristics
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Systèmes anti-éblouissement routiers - Partie 1: Performances et caractéristiques
(inclut l'amendement A1:2003)

Blendschutzsysteme für Straßen - Teil 1: Anforderungen und Eigenschaften
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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 226, Road equipment, 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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

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

This European Standard consists of the following Parts under the general title:

Anti-glare systems for roads:

- Part 1: Performance and characteristics;

- Part 2: Test methods.

NOTE This draft standard was submitted to the CEN Enquiry as prEN 12676:1999.

Annex A of this European Standard is informative.

Foreword to amendment A1:2003

This document EN 12676-1:2000/A1:2003 has been prepared by Technical Committee CEN/TC 226, Road equipment, the secretariat of which is held by AFNOR.

This amendment to the European Standard EN 12676-1:2000 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by January 2005.

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, which is an integral part of this standard.

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

Introduction

Anti-glare screens consist of manufactured equipment which reduces the glare of approaching headlights or of other external light sources.

Anti-glare screens are generally installed on public roads when it is considered beneficial to reduce the effect of glare. Common situations where anti-glare screens may be used are as follows:

a) in the central reservation of dual carriageway roads and motorways;

b) between parallel or converging roads where traffic is travelling in opposing directions;

c) glaring light sources reflecting on installations and buildings adjacent to the road;

d) glaring light from installations and buildings adjacent to the road.

The test methods for verification of conformity to the performance requirements of this standard are given in EN 12676-2.

1 Scope

This part of EN 12676 specifies the characteristics of an anti-glare screen in terms of its optical effectiveness and of the mechanical performance of its elements. It gives a method for the determination of the optical performance of anti-glare screen by calculation. Requirements and recommendations for the design of anti-glare screens to minimize maintenance are also given.

This part of EN 12676 does not apply to:

- types of anti-glare screens other than those attached to safety barriers;
- regulatory characteristics which might be required to ensure that anti-glare systems are compatible with road signs;
- specific requirements resulting from extreme environmental conditions experienced in some European countries.

2 Normative references

This part of EN 12676 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 part of EN 12676 only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 1317-2 Road restraint systems – Part 2: Performance classes, impact test acceptance criteria and test methods for safety barriers

ISO 1043-1	Plastics – Symbols and abbreviated – Part 1: Basic polymers with their special characteristics
ISO 1043-2	Plastics – Symbols – Part 2: Fillers and reinforcing materials
ISO 9227	Corrosion tests in artificial atmospheres – Salt spray tests
EN 12676-2	Anti-glare systems for roads – Part 2: Test methods

3 Definitions and symbols

For the purposes of this part of EN 12676, the following definitions apply:

3.1 occluding element: element of the anti-glare screen blocking out light which would be distracting to road users

3.2 support: element onto which occluding elements are mounted

3.3 base: structure (safety barrier) to which the support is attached

3.4 fixing element: component, e.g. screw and nut, which enables the fastening of the occluding elements onto the support, or the support onto its base

NOTE The fixing elements of the anti-glare screen are part of the system.

3.5 light transmission factor, C_{ti}: the proportion of incident light which passes through the anti-glare screen at a particular angle of incidence *i*

3.6 limiting angle, α_1: angle of incidence below which incident light is completely blocked out by the anti-glare screen ($C_{ti} = 0$)

4 Requirements

4.1 Design and fixation

The anti-glare screen design shall consist of occluding elements which are mounted on a support (Figure 1) or directly on the base. Anti-glare screens shall only be fixed in the lower part and shall be designed to be compatible with safety barriers fulfilling the requirements of EN 1317-2.

The complete fixed anti-glare screen, or parts of it, even fixing elements, may not project over the edge of the safety barrier. Nevertheless, it is allowed that the plastic parts of an anti-glare screen fixed on a concrete barrier may project up to 100 mm beyond the edge of the upper part of the barrier.

4.2 Maintenance

Hollow bodies shall be closed at the top in order to prevent any dirt, snow and water from penetrating into them and also to prevent birds from nesting inside.

Anti-glare screens shall be designed in such a way to enable the replacement of any section of the system without having to remove adjacent parts in any way.

> NOTE Anti-glare screens should only require attention if damaged by vehicle impact or by other unusually severe conditions. During its functional life time, it should resist minor impacts from stones.

4.3 Characteristics

If accessibility is required, it shall fall into one of the two following categories:

Category 1: designed to permit at any place the passage of personnel carrying stretchers from one side of the base to the other without the need to remove a section of the anti-glare screen.

Category 2: not designed to permit access at any place, but requiring a section of the anti-glare screen to be removed to permit access.

> NOTE This design may be appropriate in areas, such as urban areas, where it is desirable to prevent pedestrians climbing over the base. This category of anti-glare screens should permit sections to be removed by emergency service personnel.

4.4 Durability

4.4.1 Synthetic materials

The durability of the synthetic materials shall be verified by testing the impact strength of specimens before and after ageing in accordance with EN 12676-2. When new, the relative difference between the values of tensile impact strength obtained at temperatures of (23 $\pm$ 3) °C and (-30 $\pm$ 3) °C shall not exceed 15 %. After ageing, the tensile impact test values shall be more than 80 % of their initial values for each of the tested specimens at (23 $\pm$ 3) °C and at (-30 $\pm$ 3) °C.

Only ductile fractures are acceptable.

4.4.2 Metallic elements

Metallic elements of the anti-glare system shall be made of, or coated with, corrosion resistant materials. Durability shall be assessed in accordance with EN 12676-2. Parts which are made of, or coated with, synthetic materials shall be aged by the process described in EN 12676-2 before being tested. [A1] Hot dipped galvanized steel components shall conform to ISO 1459 and ISO 1461. [A1]

4.5 Effectiveness with respect to glare

4.5.1 General

The anti-glare screen shall reduce the level of light that would otherwise dazzle road users, as described below. It shall be effective over its full height, i.e. from the upper edge of the base on which it is mounted. However, a maximum gap of 20 mm is admissible between the upper edge of the base and the bottom edge of the support or of the occluding elements.

NOTE The height of the anti-glare screen depends on general conditions, such as the relative levels of vehicle headlights and the eyes of the drivers in the opposing traffic directions. The main factors to be considered are the height of these above the road and their distance to the anti-glare screens. However, it may not be possible in every situation to completely eliminate the effect of glare because of conflicting road geometry. Annex A provides examples of the heights of anti-glare screens needed to block out light for a number of typical cases.

〚A1〛 Two types of products are distinguished:

a) those designed in order "to block out all the incident rays" They have to comply with the geometrical condition $tan\ \alpha j \geq 0{,}33$. This condition is checked by calculation (**4.5.2**);

b) those which do not comply with the condition $tan\ \alpha j \geq 0{,}33$ designed in order to "block out partially the incident rays". They have to fulfil the threshold value indicated in **4.5.3**. This characteristic is determined by test (**4.5.3**). 〚A1〛

4.5.2 Verification by calculation

Because of the way they are constructed, some systems totally block out the incident rays up to a limit angle α_1. For elements perpendicular to the axis of installation, this angle may be found by calculating its tangent using the following equation:

$$\tan \alpha_1 = \frac{L}{D}$$

where:

D is the distance between two occluding elements;

L is the width of an occluding element.

If *L* is not constant it shall be obtained by dividing the surface area resulting from the projection of an occluding element on a vertical plane perpendicular to the direction of the axis of installation of the system, by the height of the occluding element (see Figure 2).

If $\tan \alpha_1 \geq 0{,}33$ verification in accordance with **4.5.3** is not necessary.

4.5.3 Verification by testing

This verification is necessary when $\tan \alpha_1 < 0{,}33$.

The level of screening produced by the anti-glare screen for an angle of incidence *i* is given by the transmission factor C_{ti} where *i* is the angle between the axis of the system and the direction of the incident ray.

C_{ti} shall be determined in accordance with EN 12676-2.

The maximum acceptable values of C_{ti} shall be as follows:

a) for angles of incidence $\leq 12°$, $C_{ti} \leq 0,05$;

b) either $C_{t15} \leq 0,05$, or $C_{t18} \leq 0,2$ and $C_{t15} \leq 0,15$.

4.6 Lateral visibility

There are two groups of anti-glare screens.

Group 1: Good lateral visibility through the occluding elements is ensured. For this purpose, any rectangle of length 1 m and of the same height as the occluding elements is selected in a vertical plane which contains the direction of the axis of installation of the system (see Figure 3). The surface area occupied by material (the solid area) shall not exceed 20 % of the total surface area of the rectangle.

Group 2: Other anti-glare screens.

4.7 Resistance to wind

A complete section of the anti-glare system shall be tested in a wind tunnel at an air speed of 40 m/s (144 km/h), as described in EN 12676-2. None of the recorded deformation values shall exceed 10 % in the transverse direction and 25 % in the longitudinal direction.

If the system is available in several heights only the highest shall be tested.

5 Marking

〚A1〛 Each anti-glare screen shall carry the following information, affixed in a readable way on a screen element at least every four meters over the length of the device. 〚/A1〛

a) name of the manufacturer;

b) year and quarter of manufacture;

c) abbreviation of the group of synthetic materials used in accordance with ISO 1043-1 and ISO 1043-2.

〚A1〛 6 Evaluation of conformity

6.0 General

The evaluation of conformity is based on:

- initial type testing;
- factory production control. 〚/A1〛

〈A1〉

6.1 Initial type testing

6.1.1 Controlled elements

The evaluation of conformity relates to the following elements:

a) harmonized characteristics, dependent on the strength of the horizontal loads and the capability of filtering of the light:

- resistance to wind, in accordance with the indications of **4.7**;
- light screening capability, in accordance with the indications of **4.5.2** and **4.5.3**;
- durability of light screening capability in screens with synthetics material in accordance with the indications of **4.4.1**;
- durability of light screening capability in screens with metallic elements in accordance with the indications of subclause **4.4.2**;
- durablility of resistance to wind in screens with synthetics material in accordance with the indications of **4.4.1**;
- durablility of resistance to wind in screens with metallic elements in accordance with the indications of **4.4.2**.

b) other characteristics (not harmonized according to the mandate):

- attachment unit, in accordance with the specifications of **4.1**;
- provisions with respect to maintenance in conformity with the indications of **4.2**;
- characteristics of accessibility in conformity with the indications of **4.3**;
- side visibility, in accordance with the specifications of **4.6**;

6.1.2 Nature of control

The manufacturer specifies the conditions that have guided the choice of the prototype, and that guaranty the representativeness of sample tested compared to the production.

He provides description of the product (nature of constituents including raw materials, geometrical dimensions), to allow the traceability of the product and its constituents.

A new test of the type is necessary for any modification of:

- form;
- nature of materials;
- method of manufacture, for synthetic materials;
- conditions of fixing on the support.

This new test relates to the characteristics or performances influenced by this modification: 〈A1〉

A1

Modification	Characteristics to be tested
Form	. Capability of filtering of the light
Nature of material	. Wind resistance
Method of manufacture (for synthetic materials)	. Wind resistance . Durability
Fixing on support	. Wind resistance . Durability

6.1.3 Report of test

The result of initial type testing is the subject of a detailed report, which includes:

- name and address of the manufacturer or his agent established in the Economic European area;
- place of production;
- detailed description of the product (identification, use, precise geometrical characteristics, material, protection against corrosion, conditions of affixing on the support,…);
- requirement with which the product shall be in conformity;
- results of the tests, observations or evaluations, relating to characteristics identified in **6.1**;
- possible conditions applicable to the use of the product;
- conditions and period of validity of the test report;
- name and responsibility of the person authorized to sign the report of test.

6.2 Factory production control

6.2.1 Aim of control

The manufacturer is responsible for the organization of the effective implementation of his system of control of production in factory. The aim of this control is to give confidence in the conformity of the product. It is appropriate, for this reason:

- to consign in writing the tasks and responsibilities for each person involved in the control of the production;
- to write and to keep the documents defining the control of production in factory.

A1

〈A1〉
6.2.2 Verifications and tests

The factory production control include:

- identification of the raw materials allowing the traceability;
- controls of:
  - geometrical dimensions;
  - process used to make the product;
  - systems used to affix occultation elements in the support.

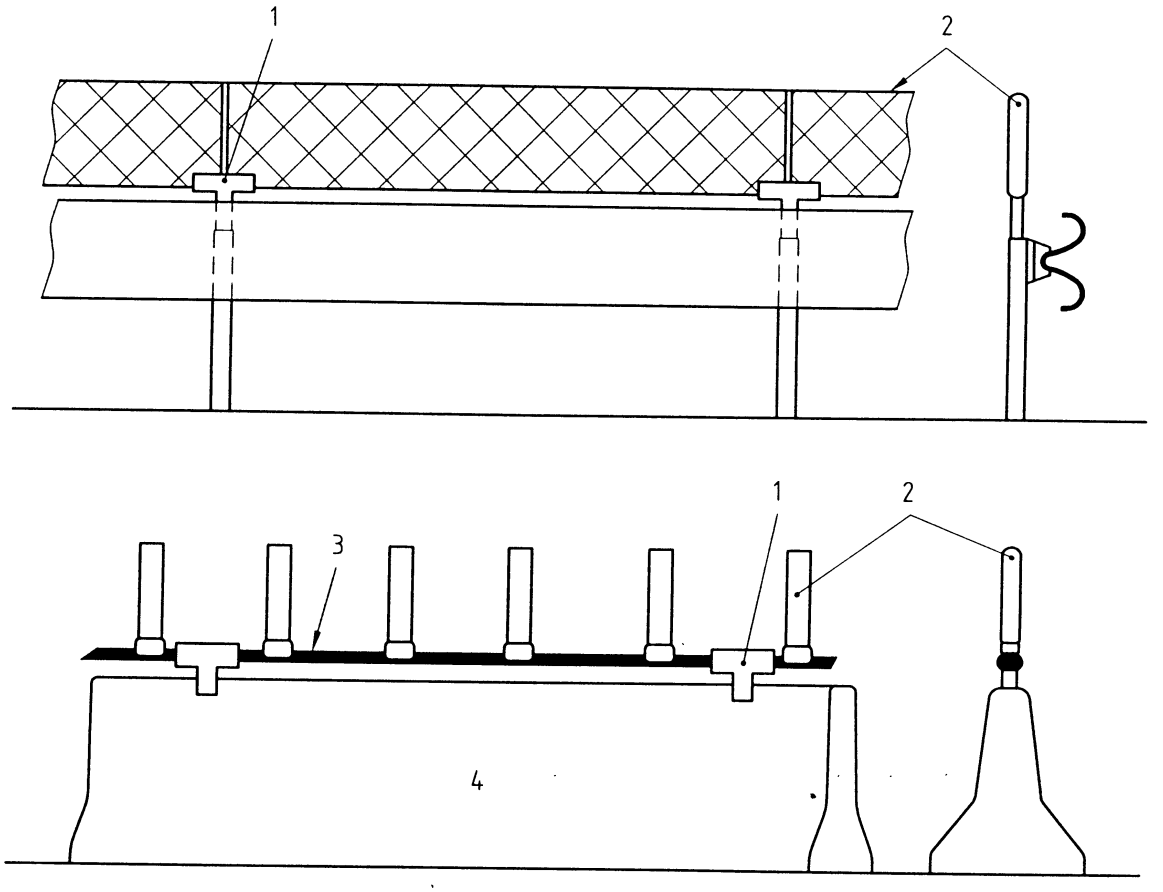
The tests are in conformity with the tests envisaged by the present standard, for the characteristics concerned.

The origin of the raw materials and the results of controls of the production in factory shall be recorded in the register of the manufacturer. The description of the product, the date of manufacture, the process used to make the product, the test results and the criteria of acceptance shall be consigned in the register aimed by the person responsible for the control.

6.2.3 Traceability

The manufacturer or his agent established in the EEA records the description of the product, including the details and characteristic of manufacture. The name of the customer who first sold the product is retained.

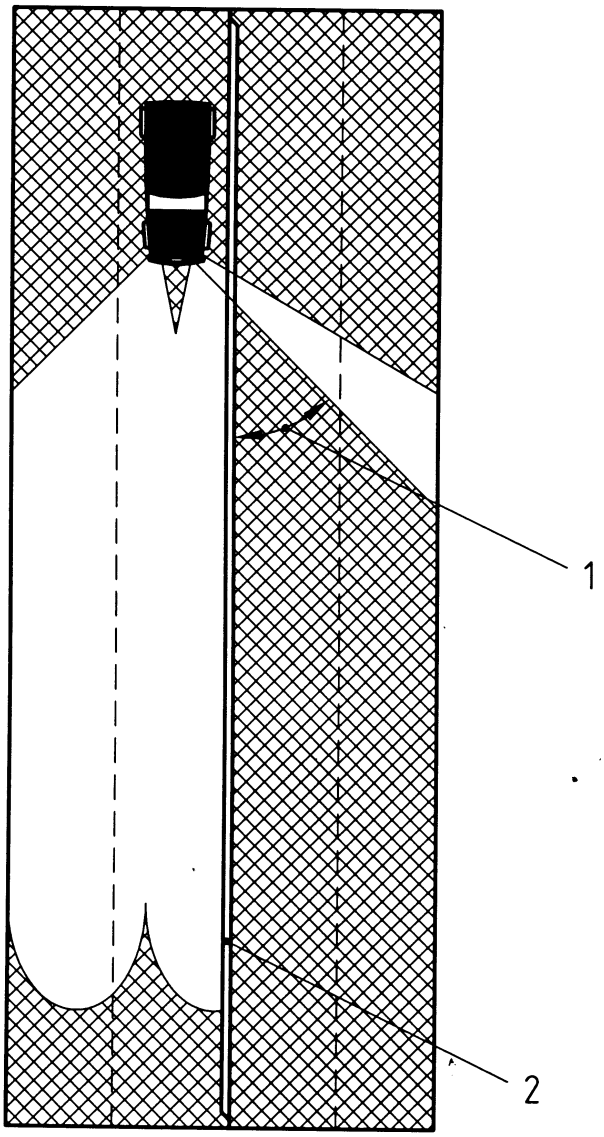
〈A1〉



Key

1 Fixing element
2 Occluding element
3 Support
4 Base

Figure 1 – Two types of anti-glare screens mounted onto different types of bases

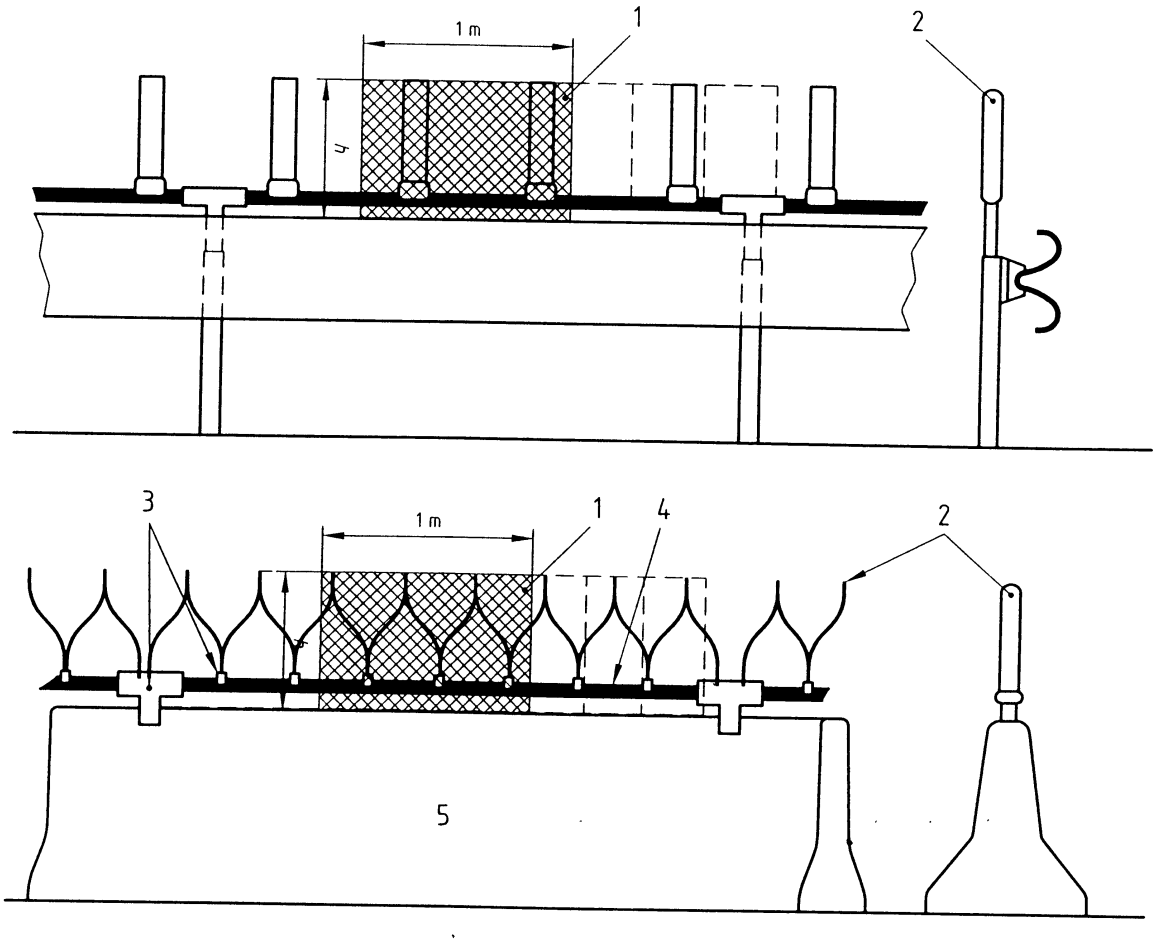


Key

1 Limiting angle α_1
2 Anti-glare screen

Figure 2 – Measurement of limiting angle α_1

Dimensions in metres



Key

1 Rectangle which serves as a basis for calculation of lateral visibility (height *h*, length 1 m)
2 Occluding element
3 Fixing element
4 Support
5 Base

NOTE The position of the rectangle corresponds to the maximum area occupied by the material.

Figure 3 – Example of calculation of lateral visibility for two types of anti-glare screen

Annex A (informative)

Method for the calculation of the effective height

A.1 General

This annex suggests parameters and a calculation method for determining the effective height of an anti-glare screens that is needed to block out the incident rays which may dazzle the driver of an oncoming vehicle.

The calculation given in clause **A.3** is based on the path of the light ray which just avoids being blocked out by the system.

The fact that such a ray may not be part of an incident light beam of a vehicle (excessive vertical beam angle, see clause **A.5**) is not considered.

The beam of vehicle headlamps generally illuminates up to approximately 15° above the road surface.

The minimum effective heights which are calculated may, because of this, be slightly greater than the true minimum effective heights.

In practice, the following calculation provides a good approximation in the case of pavements with a constant longitudinal gradient. In specific cases (sag or summit curves) it is necessary to perform a separate calculation.

A.2 Parameters

The parameters used in the calculation are given below. The numerical values which are suggested for these parameters are only indicative. They correspond to the averages for vehicles in Europe.

- H_e is the height of the driver's eyes above the carriageway (see Figure A.1):

For light vehicles, H_e = 1,20 m;
For heavy vehicles, H_e = 2,45 m.

- H_b is the height of the vehicle's headlamps above the carriageway (see Figure A.1)

For light vehicles H_b = 0,60 m;
For heavy vehicles H_b = 1,05 m.

- H_m is the minimum effective height above the ground of the anti-glare screen for the ray to be screened.

- D_b is the distance from the vehicle headlamp which is the source of the incident light ray to the anti-glare screen. The minimum distance $D_{b,min}$ corresponds to the distance between the edge of the carriageway and the axis of the anti-glare screen, i.e. 1,20 m (see Figure A.2).

The maximum distance $D_{b,max}$ has been set at 8,70 m for a vehicle on the outside lane of a three-lane carriageway. Higher values are possible in the case of wider carriageways.

- D_e is the distance from the eyes of the driver who may potentially be dazzled to the anti-glare screen (see Figure A.2).

D_e varies between 1,50 m (i.e. $D_{b,min}$ + 0,30 m) and 9 m (i.e. $D_{b,max}$ + 0,30 m) for a driver on the outside lane of a three-lane carriageway (the value of 0,30 m corresponds to the average offset between the headlamps of the vehicle and the eyes of the driver). Values may be higher in the case of wider carriageways.

A.3 Calculations

The equations A.1 and A.2 relate to the vertical plane which contains the light ray under consideration and which is at an angle α to the vertical plane which contains the axis of the anti-glare screen. This plane has coordinates (X , Y). The abscissa is perpendicular to the axis of the anti-glare screen and the origin of the ordinate is at the level of the carriageway (see Figure A.1).

The light beam considered therefore passes through the two points with the coordinates ($-D_b/\sin\alpha$, H_b) and ($D_e/\sin\alpha$, H_e). The minimum effective height H_m is given by equations A.1 and A.2:

$$Y = \frac{H_e - H_b}{D_b + D_e} X \sin\alpha + \frac{H_e D_b + H_b D_e}{D_b + D_e} \qquad \text{(A.1)}$$

H_m corresponds to the value of Y for $X = 0$, therefore

$$H_m = \frac{H_e D_b + H_b D_e}{D_b + D_e} \qquad \text{(A.2)}$$

A.4 Values of H_m for different levels of protection

Table A.1 (H_e = 1,20 m) gives the values of H_m (in metres) for the protection of light vehicles and Table A.2 (H_e = 2,45 m) for the protection of heavy vehicles.

Table A.1

D_b (m)	D_e (m)	H_b = 0,60 m	H_b = 1,05 m
1,20	1,50	0,87	1,12
1,20	9,00	0,67	1,07
8,70	1,50	1,11	1,18
8,70	9,00	0,89	1,12

Table A.2

D_b (m)	D_e (m)	H_b = 0,60 m	H_b = 1,05 m
1,20	1,50	1,42	1,67
1,20	9,00	0,82	1,21
8,70	1,50	2,18	2,24
8,70	9,00	1,51	1,74

A.5 Corrections for angles and summary of results

The values calculated in Tables A.3 and A.4 do not take into account the gradient of the incident ray which is represented by β in Figure A.1 such that:

$$\tan\beta = \frac{H_e - H_b}{D_b + D_e}\sin\alpha \qquad \text{(A.3)}$$

In the following calculation, α is taken as 30° and β as 15°.

NOTE An unscreened beam does not disturb oncoming drivers if it reaches them at a wide angle. In general, it is considered that the disturbance is negligible for α > 30°.

The physical limit of the value H_e - H_b / D_b + D_e is therefore tan 15°/sin 30° = 0,536.

Tables A.3 and A.4 give the theoretical values for H_e - H_b / D_b + D_e for the situations described in Tables A.1 and A.2 respectively.

These values are to be compared with the limiting value of 0,536.

Table A.3

D_b (m)	D_e (m)	H_b = 0,60 m	H_b = 1,05 m
1,20	1,50	0,222	0,056
1,20	9,00	0,059	0,015
8,70	1,50	0,059	0,015
8,70	9,00	0,034	0,008

Table A.4

D_b (m)	D_e (m)	H_b = 0,60 m	H_b = 1,05 m
1,20	1,50	0,685*	0,519
1,20	9,00	0,181	0,137
8,70	1,50	0,181	0,137
8,70	9,00	0,105	0,079
* unacceptable value			

The one unacceptable value corresponds to a minimum effective height of 1,42 m; this involves few constraints with respect to the other values in Table A.2. It is not necessary to make any correction for angle in order to determine the values of H_m in the different cases considered.

The hypotheses and parameters used have therefore led to the following conclusions:

- an anti-glare screen with a height of at least 1,18 m above the ground will protect light vehicles from all the incident rays likely to cause disturbance;

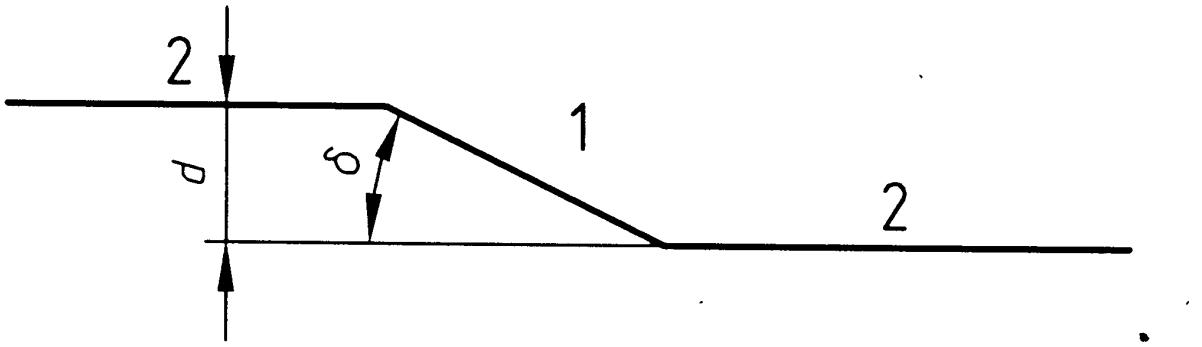
- an anti-glare screen with a height of at least 1,67 m above the ground will protect heavy vehicles from incident rays from all vehicles on the outside lane of the opposing carriageway;

- a height of more than 2 m is required in order to protect heavy vehicles from incident rays from vehicles travelling on the outside lane of a two-lane carriageway or on the two outside lanes of a three-lane carriageway.

These results are different if there is a change in the basic hypotheses and parameters.

A.6 Roads with carriageways at different levels

The type of profile as shown in Figure A.3 is occasionally to be found.



Key

1 Central reservation
2 Carriageway

Figure A.3

The difference in height between the two carriageways is *d*. This parameter affects H_m and a system of greater height may be necessary in order to block out the rays from the higher carriageway. The angle of slope of the central reservation is δ.

If the origin of the ordinate is at the level of the lower carriageway, equation A.1 becomes:

$$Y = \frac{H_e - (H_b + d)}{D_b + D_e} X \sin\alpha + \frac{H_e D_b + (H_b + d) D_e}{D_b + D_e} \qquad \text{(A.4)}$$

H_m corresponds to the value of $Y + (d/2)$ for $X = 0$, i.e.

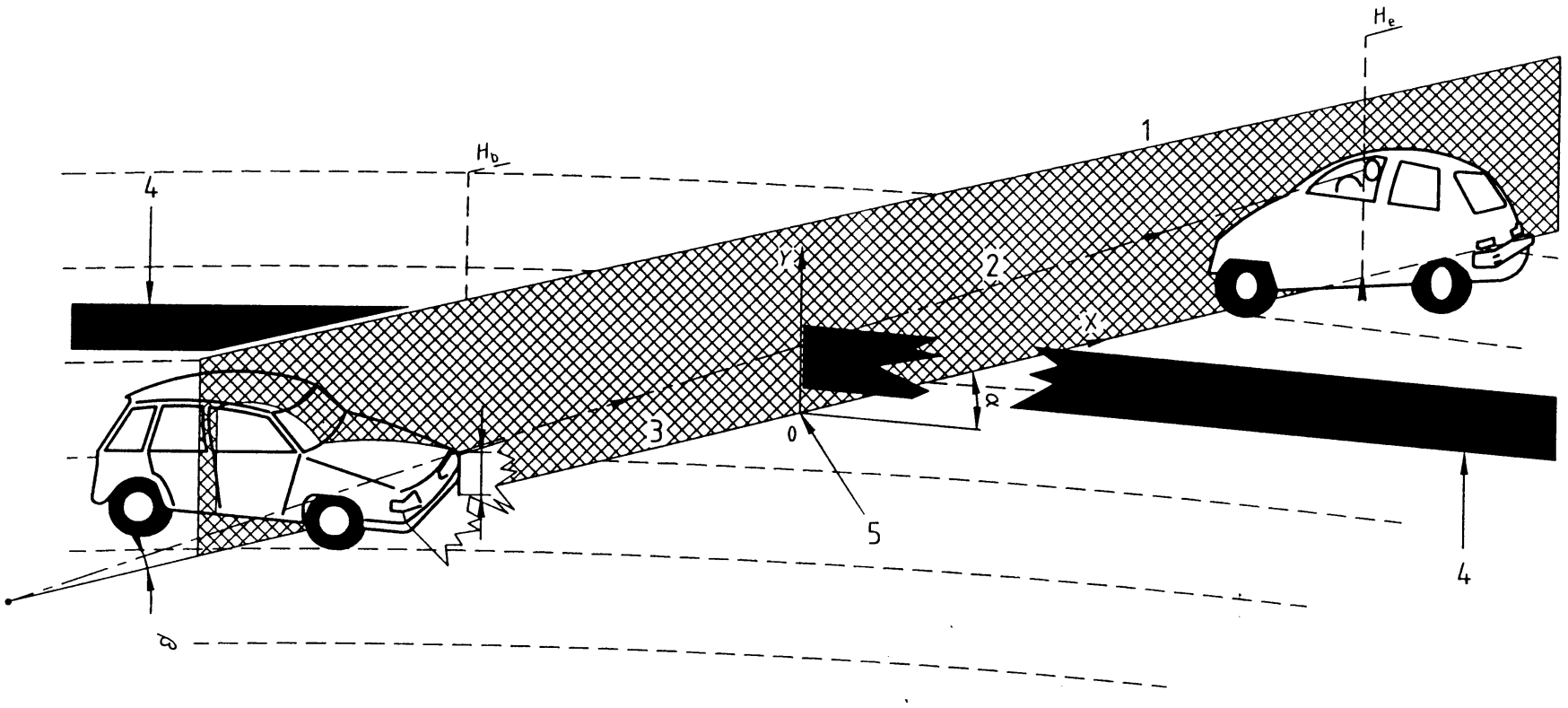
$$H_m = \frac{H_e D_b + H_b D_e}{D_b + D_e} + \frac{d}{2}\left(\frac{D_e - D_b}{D_e + D_b}\right) \qquad \text{(A.5)}$$

A corrective term $(d/2)$ $(D_e - D_b / D_e + D_b)$ appears, which is applied to the values calculated according to equations A.1 and A.2.

In the subsequent calculation a value of 0,25 m was used for *d* and the value of the slope of the central reservation was taken as 45°. All the values of D_b and D_e were increased by (d/2)cotan 45° = 0,125 m in order to take account of the additional width of the central reservation.

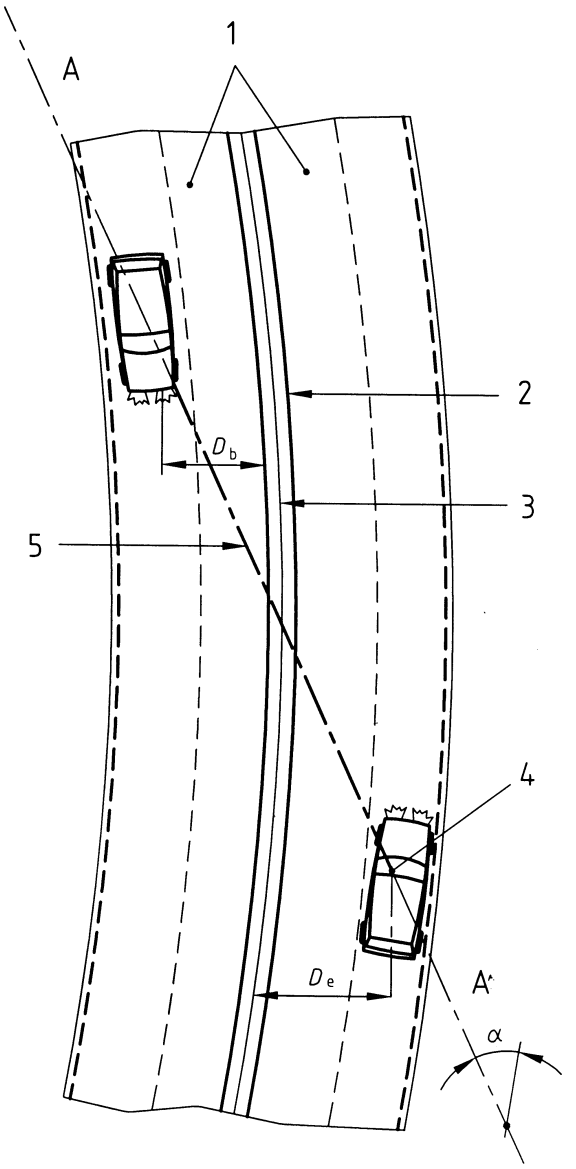
In the worst case, i.e. where D_b = 1,325 and D_e = 9,125, the height of the anti-glare screen needs to be increased by 0,10 m.

Equation A.5 is valid for all values of *d* and all slopes. It is only necessary to recalculate the values of D_e and D_b by increasing them by $(d/2)$ cotan δ.



Key
1 Vertical plan under consideration
2 Light ray under consideration
3 Level of the carriageway
4 Anti-glare screen
5 Corresponds to (0 , 0)

Figure A.1



Key

1 Carriageway
2 Edge of the carriageway
3 Axis of the anti-glare screen
4 Driver's eyes
5 Light ray under consideration

Figure A.2

A1 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/111 “Circulation Fixtures”, given to CEN by the European Commission and the European Free Trade Association.

The clauses of this, and where relevant another, European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the anti-glare screens for the intended uses indicated herein.

> **Warning**: Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the *anti-glare screens for roads* falling within the scope of this European Standard.
>
> In addition to any specific clauses relating to dangerous substances contained in this Standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.
>
> Note: an informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (CREATE, accessed through http/europa.eu.int).

This annex establishes the conditions for the CE marking, of the *anti-glare screens for roads* 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. A1

〚A1〛 Table ZA.1 — Relevant clauses for *anti-glare screens for roads*

Product: anti-glare screens for roads covered by the scope of this standard **Intended use(s): in circulation areas** (to restrict glare both from oncoming vehicles and from external light sources)			
Essential characteristics	**Requirement clauses in this standard**	**Mandated level(s) or class(es)**	**Notes**
Resistance to horizontal loads	Clause **4.7**: Resistance to wind	None	pass fail test, threshold values
Light screening capability	Clause **4.5.2**: Verification by calculation	None	pass fail verification threshold values
	Clause **4.5.3**: Verification by testing (*)	None	pass fail test threshold values
Durability (of resistance to horizontal loads)	Clause **4.4.1**: in screens with synthetic materials	None	pass fail test threshold values
	Clause **4.4.2**: in screens with metallic materials	None	pass fail conditions
Durability (of light screening capability)	Clause **4.4.1**: in screens with synthetic materials	None	pass fail test threshold values
	Clause **4.4.2**: in screens with metallic materials	None	pass fail conditions
Dangerous substances	See notes in this annex	—	—

(*) this verification is necessary only when $\alpha_1 < 0{,}33$

The requirement on a certain characteristic is not of application 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 to 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 attestation of conformity of anti-glare screens

ZA.2.1 System of attestation of conformity

The system of attestation of conformity for the *anti-glare screens* indicated in Table ZA-1, in accordance with the decision of the Commission (96/579/EC) of 1 July 1996 as given in Annex III of the mandate M/111 for “*Circulation fixtures*”, is shown in Table ZA-2 for the indicated intended use(s) and relevant level(s) or class(es): 〚A1〛

〈A1〉 Table ZA.2 — System of attestation of conformity for anti-glare screens

Product(s)	intended use(s)	Level(s) or class(es)	Attestation of conformity system(s)
Anti-glare screens	for circulation areas	—	3
System 3: see Directive 89/106/EEC (CPD), Annex III.2.(ii), second possibility			

The attestation of conformity of *anti-glare screens* in Table ZA.1 shall be based on the evaluation of conformity procedures indicated in Table ZA.3 resulting from application of those clauses of this or other European Standard indicated therein.

Table ZA.3 — Assignment of evaluation of conformity tasks for anti-glare screens

Tasks		Scope of the tasks	Clauses to apply
Tasks for the manufacturer	Factory production control	Parameters related to all characteristics quoted in Table ZA.1	**6.2**
Tasks for the notified body	Initial type testing	All relevant characteristics of Table ZA.1	**6.1**

NOTE The test concerning resistance to wind and calculation or testing of light screening capability can be performed by manufacturers and checked for endorsement by a notified laboratory.

ZA.2.2 EC declaration on conformity

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

- name and address of the manufacturer, or his authorized 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 conforms (e.g. annex ZA of this EN);
- possible conditions applicable to the use of the product;
- name and address of the notified laboratory(ies);
- name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorized representative.

The above mentioned declaration shall be presented in the official language or languages of the Member State in which the product is to be used. 〈A1〉

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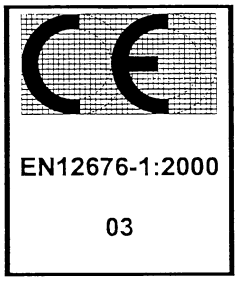
ZA.3 CE marking and labelling

The manufacturer or his authorized representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the anti-glare screens and on the accompanying commercial documents (e.g. a delivery note).

The following information on the product and its essential characteristics shall accompany the CE marking symbol, for any four meters length of the device in visible location (after implementation):

- On the product, in a box which have as minimal size: 3 cm × 3 cm:
  - CE symbol given in the directive 93/68/EEC;
  - reference to the European Standard (EN 12676-1:2000);
  - the last two digits of the year in which the CE marking was affixed.



- On the documents accompanying the marketing: A1

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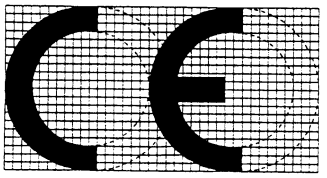
- CE symbol given in the directive 93/68/EEC;
- name or identifying mark of the producer;
- registered address of the producer;
- the last two digits of the year in which the marking is affixed;
- reference to this European Standard (EN 12676-1:2000);
- results of the tests and conformity of the product to the threshold values for the characteristics listed in the Table ZA.1.1.

Figure ZA.1 — Example of CE marking information

indications included in CE marking	explanation
	CE conformity marking consisting of the "CE" - symbol given in directive 93/68/EEC
Any Co Ltd, P.O. Box 21, B – 1050 **03**	name or identifying mark and registered address of the manufacturer last two digits of year in which the CE marking was affixed

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EN 12676-1:2000 Anti-glare screen ▪ **Resistance to horizontal loads….(conform)** ▪ **Light screening capability……..(conform)** ▪ **Durability……..(conform)** ▪ **Dangerous substances:X Decree nn/yy of yyyy/mm/dd**	Reference to the European standard Definition or designation of the product information on essential characteristics and performances

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 be mentioned.

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W4 4AL