

ICS 93.080.30

English Version

## Fixed, vertical road traffic signs - Part 2: Transilluminated traffic bollards (TTB)

Signaux fixes de signalisation routière verticale - Partie 2 :  
Bornes lumineuses

Ortsfeste, vertikale Straßenverkehrszeichen - Teil 2:  
Innenbeleuchtete Verkehrsleitsäulen (TTB)

This European Standard was approved by CEN on 4 February 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 12899-2:2007) has been prepared by the 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of an identical text or by endorsement, at the latest by May 2008, and conflicting national standards shall be withdrawn at the latest by August 2012.

No existing European Standard is superseded.

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 Directives.

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

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

*Fixed, vertical road traffic signs —*

Part 1: *Fixed signs*

**Part 2: (this part) *Transilluminated traffic bollards (TTB)***

Part 3: *Delineator posts and retroreflectors*

Part 4: *Factory production control*

Part 5: *Initial type testing*

It is based on performance requirements and test methods published in CEN, CENELEC, CIE (International Commission on Illumination) and ISO documents together with standards of the CEN member organizations.

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

## **Introduction**

This European Standard is designed for use by road authorities. It can also be used by private developers who wish to use signs on their own land similar to those used on public highways.

It can be used to implement type approval and certification testing.

It derives from performance requirements and test methods published in CEN, CENELEC, CIE and ISO documents together with standards of the CEN member organizations.

## 1 Scope

This Part 2 of EN 12899 specifies requirements for new transilluminated traffic bollards (TTBs) including their fixing, which may incorporate traffic signs (type 1 TTB) or may support traffic signs (type 2 TTB) to be used in traffic circulation areas.

It covers performance requirements and test methods.

Colorimetric and retroreflective properties as well as luminance of transilluminated illuminated portions are specified taking into account CIE recommendations.

Structural requirements for TTBs include performance under static and dynamic loading.

Provision is made for safety in use, including vehicle impact.

Devices of similar function, but without transillumination or less than 600 mm in height, are not covered.

NOTE Foundations are not specified in this standard but should be adequate to support the loads to be carried.

Unless otherwise stated, clauses in this standard apply to both type 1 and type 2 TTBs.

## 2 Normative references

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

EN 12899-1:2007, *Fixed vertical road traffic signs — Part 1: Fixed signs*

EN 12899-4, *Fixed vertical road traffic signs — Part 4: Factory production control*

EN 12899-5, *Fixed vertical road traffic signs — Part 5: Initial type testing*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN ISO 139 *Textiles — Standard atmospheres for conditioning and testing (ISO 139:2005)*

EN ISO 877:1996, *Plastics — Methods of exposure to direct weathering, to weathering using glass-filtered daylight, and to intensified weathering by daylight using Fresnel mirrors (ISO 877:1994)*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:1999)*

EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

ISO 4:1997, *Information and documentation — Rules for the abbreviation of title words and titles of publications*

### 3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in ISO 4:1997, the terms and definitions given in EN 12899-1:2007 and the following apply.

#### 3.1

##### **transilluminated traffic bollard (TTB)**

totally or partially transilluminated device placed to warn drivers of obstructions in the road

#### 3.2

##### **type 1 TTB**

TTB which incorporates one or more traffic signs or plain surfaces as alternatives (see Annex A for illustrations)

#### 3.3

##### **type 2 TTB**

TTB which supports one or more traffic signs, (see Annex A for illustrations)

#### 3.4

##### **base**

part of a TTB which is used to secure the body to the foundation

#### 3.5

##### **body**

part of a type 1 TTB below the head and attached to the base, or the whole of a type 2 TTB above the base

#### 3.6

##### **depth**

maximum horizontal dimension parallel to the direction of the traffic flow on the road in which the TTB is located

#### 3.7

##### **head**

top part of a type 1 TTB measured from the upper extremity to not more than 50 mm below any sign or plain surface in which the traffic sign(s) are incorporated

#### 3.8

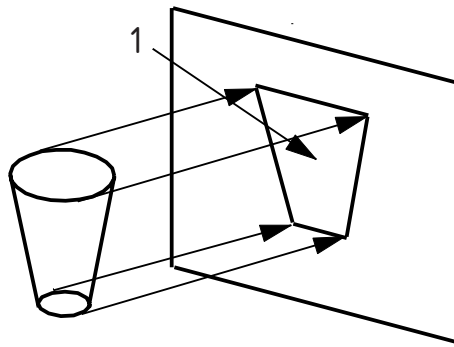
##### **overall height**

vertical dimension measured from the ground line to the upper extremity of the TTB

#### 3.9

##### **projected area**

area of a three dimensional object when projected on to a plane surface at right angles to the direction of viewing (see Figure 1)

**Key**

1 Projected area

**Figure 1 — Projected area****3.10  
ground line**

horizontal line marked on the TTB which, when the TTB has been installed in accordance with the manufacturer's instructions, is level with the surface of the obstruction on which it is installed

**3.11  
width**

maximum horizontal dimension at right angles to the direction of traffic flow

**4 General****4.1 Design****4.1.1 Overall height****4.1.1.1 Type 1 TTBs**

The minimum overall height of type 1 TTBs shall conform to Table 1.

**Table 1 — Overall height**

<b>Class</b>	<b>Minimum overall height mm</b>
OH1	900
OH2	1100

The projected distance between the upper extremity of the head and the top of any sign or plain surface shall be not more than 70 mm.

NOTE OH1 TTBs are suitable to support signs or plain surfaces less than 350 mm in diameter. OH2 TTBs are suitable to contain signs or plain surfaces 350 mm in diameter and greater.

**4.1.1.2 Type 2 TTBs**

Type 2 TTBs shall have a minimum overall height of 750 mm.

## 4.1.2 Head

### 4.1.2.1 General

A head not incorporating one or more traffic signs shall incorporate plain areas as alternatives. When the top surface of the head is a separate part it shall be fixed to the body. Any curvature in the plane of a sign or plain surface shall be not less than 2000 mm radius in any direction.

### 4.1.2.2 Width of head (type 1 TTB)

When a sign or plain surface is incorporated into the front side of the head, the width of the head shall be not less than the diameter of the sign or dimension of the plain surface. The minimum width shall be not less than 230 mm.

### 4.1.2.3 Depth of head (type 1 TTB)

When a sign or plain surface is incorporated into either side of the head, the depth of the head shall be not less than the diameter of the sign or the dimension of the plain surface and in any case not less than 125 mm.

## 4.1.3 Body

### 4.1.3.1 Width of body

The width of the body, at heights greater than 100 mm above the ground line, shall be not less than 150 mm.

### 4.1.3.2 Depth of body

The depth of the body, for types 1 and 2 TTB at heights greater than 100 mm above the ground line, shall be not less than 150 mm.

### 4.1.3.3 Projected area

#### 4.1.3.3.1 Type 1 TTBs

The projected area of the body, 100 mm above the ground line, shall be not less than the values in Table 2.

**Table 2 — Projected area of bodies of type 1 TTB**

Class	Area mm <sup>2</sup>	
	Side containing a sign or plain area	Other side
PA1	60 000	60 000
PA2	120 000	90 000
PA3	180 000	120 000
PA4	240 000	50 000



#### 4.1.3.3.2 Type 2 TTB

The projected area of the body, from any direction, 100 mm above the ground line, shall be not less than 97500 mm<sup>2</sup>.

#### 4.1.3.4 Classification of impact resistance

The classification for impact resistance shall be:

IR0 TTB secured directly to the ground which has no breakaway design features, nor any of the design features of IR2 or IR3 TTB and which is designed to remain fixed to the foundation under vehicle impact (rigid);

IR1 TTB designed to break away under vehicle impact (breakaway);

IR2 TTB mounted so as to deflect and return to original position after vehicle impact (spring-back);

IR3 TTB made from materials that regain their original shape following deformation caused by vehicle impact (deformable).

#### 4.1.3.5 Body components of external surface

Any components of the external surface, not integral with that surface, shall be securely fixed so that they perform as if they were an integral part of the external surface.

### 4.1.4 Base

#### 4.1.4.1 Dimensions

The dimensions of the base shall be appropriate to the body to which it is attached so far as it provides the required fixing stability for the bollard to comply with 4.3.1 and 4.3.2

#### 4.1.4.2 Holding down bolts

Unless otherwise indicated in the manufacturer's installation instructions, the design shall provide for holding down bolts which shall be corrosion resistant to SP1 or SP2 in accordance with 7.1.7 of EN 12899-1:2007.

The manufacturer shall indicate in the installation instructions whether holding down bolts are required if the base incorporates horizontal flanges not less than 100 mm below the ground line.

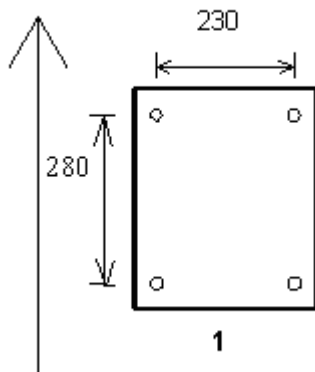
The manufacturer shall provide information with the product specifying that its fitness for use is based upon foundations of adequate size, strength and durability to withstand the effects of salt, impact, frost and weathering. The foundations shall also be of sufficient size to retain any holding down bolts.

The spacing of holding down bolts, if provided, in the base shall conform to one of the following classes:

HD1 280 mm × 230 mm (see Figure 2);

HD2 as declared by the manufacturer.

Dimensions in millimetres



**Key**

1 Direction of traffic on the road where the TTB is located

**Figure 2 — Spacing of holding down bolts**

**4.1.5 Safety**

Access to the interior shall be gained only by the use of a special tool or key.

**4.1.6 Electrical**

Electrical components, circuitry and installation shall conform to 7.1.13 of EN 12899-1:2007. Electricity supply cables shall enter the base below the ground line.

**4.2 Visual performance**

**4.2.1 General**

When the head and/or body are part opaque, 85 % of the projected areas facing oncoming traffic and more than 100 mm above the ground line shall be transilluminated and/or retroreflective.

**4.2.2 Daylight chromaticity and luminance factor**

The daylight chromaticity and luminance factor shall conform to the requirements of Table 3.

**Table 3 — Chromaticity coordinates and luminance factor**

Location	Clause of EN 12899-1:2007
Opaque areas	7.3.1.3
Retroreflective areas	4.1.1.3
Transilluminated areas	7.3.1.3

### 4.2.3 Transillumination

#### 4.2.3.1 General

The head of type 1 TTBs may be totally transilluminated or partially transilluminated except that any traffic sign or plain surface shall be transilluminated in accordance with 4.2.2.

Any head surface of type 1 or 2 TTB, not facing traffic, may be opaque.

#### 4.2.3.2 Mean luminance $L$ and uniformity of luminance

##### 4.2.3.2.1 Type 1 TTB

The mean luminance  $L$  of all transilluminated surfaces in the head shall conform to EN 12899-1:2007, Table 19 and the uniformity of luminance shall conform to EN 12899-1:2007, Table 21, class U2.

The mean luminance  $L$  of all transilluminated surfaces in the body shall conform to EN 12899-1:2007, Table 19 and the uniformity of luminance shall conform to EN 12899-1:2007, Table 21, class U1.

The luminance contrast of both body and head shall conform to EN 12899-1:2007, Table 20..

##### 4.2.3.2.2 Type 2 TTB

The mean luminance  $L$  of all transilluminated surfaces shall conform EN 12899-1:2007, Table 19 and the uniformity of luminance shall conform to EN 12899-1:2007, Table 21, class U1.

The luminance contrast of both body and head shall conform to EN 12899-1:2007, Table 20.

### 4.2.4 Retroreflective material

Retroreflective material conforming to EN 12899-1:2007, Table 4 with a minimum projected area of 5000 mm<sup>2</sup>, shall be provided on the upper half of the body of a TTB which faces oncoming traffic.

## 4.3 Physical performance

### 4.3.1 Static loading

#### 4.3.1.1 Deflection of IR0 and IR1 TTB

When tested in accordance with 5.6.1, the permanent deflection of the upper extremity, measured after each test, shall not exceed 5 % of the height above the ground line. The signs, plain surfaces, or components of the external surface shall not be damaged or dislodged from their mountings.

#### 4.3.1.2 Deflection of IR2 TTB

When tested in accordance with 5.6.2, the permanent deflection of the upper extremity, measured after each test, shall not exceed 5 % of the height above the ground line. The signs, plain surfaces, or components of the external surface shall not be damaged or dislodged from their mountings.

#### 4.3.1.3 Deflection of IR3 TTB

When tested in accordance with 5.6.3, the permanent deflection of the upper extremity shall not exceed 10 % of the height above the ground line. The signs, plain surfaces or components of the external surface shall not be damaged or dislodged from their mountings.

### **4.3.2 Resistance to impact**

#### **4.3.2.1 Low impact test**

When tested in accordance with 5.6.5.1, the permanent (residual) deflection of the upper extremity, measured after each test, shall not exceed 5 % of the height above the ground line. There shall be no damage to the TTB at the point of impact nor shall the signs, plain surfaces or components of the external surface be damaged or dislodged from their mountings.

#### **4.3.2.2 High impact test (simulated vehicle impact)**

##### **4.3.2.2.1 Type IR1 TTB**

When tested in accordance with 5.6.5.2, the TTB shall shear from the base and the base shall not suffer any damage. Any damage suffered by the TTB shall not prevent it being remounted on the base without requiring repairs other than replacement of screws, clamps, shear pins or other mechanical means of fixing designed to break on impact. After the test any remaining parts of the TTB which are still attached to the horizontal surface shall not project more than 100 mm above the ground line.

##### **4.3.2.2.2 Type IR2 TTB**

When tested in accordance with 5.6.5.2, the TTB shall return to the original position, or have a permanent (residual) deflection of no more than 10 % of its height, measured at the upper extremity, within not less than 10 min or more than 15 min after the time of impact.

##### **4.3.2.2.3 Type IR3 TTB**

When tested in accordance with 5.6.5.2, the TTB shall return to the original position, or have a permanent (residual) deflection at the upper extremity of no more than 10 % of its height, measured, within not less than 10 min or more than 15 min after the time of impact.

#### **4.3.2.3 Torsion of IR0, IR1 and IR2 TTB**

When tested in accordance with 5.6.4, the TTB mounting shall remain intact and the permanent (residual) angular deflection shall not exceed 5°. The signs, plain surfaces or components of the external surface shall not be damaged or dislodged from their mountings.

### **4.3.3 Corrosion resistance**

The classes of corrosion shall conform to EN 12899-1:2007, 7.1.7 and Table 15.

Hot-dipped steel components shall conform to the corrosion class in EN ISO 1461 specified by the purchaser. Any aluminium component which is to be placed underground shall conform to EN 12899-1:2007.

### **4.3.4 Durability of visual performance**

When tested in accordance with 5.6.7, there shall be no apparent change in the colorimetric properties of the sample or cracking or other damage to the surface outside a circle with the point of impact as centre and with a radius of 6 mm.

### **4.3.5 Protection against foreign bodies, dust and water**

The head and body of TTBs shall resist penetration in accordance with the index of penetration code (IP) in EN 60529 to minimum level 2 for solid particles and minimum level 3 for water.

The base of all TTBs shall resist penetration in accordance with the index of penetration code (IP) given in EN 60529 to minimum level 5 for solid particles and minimum level 6 for water.

NOTE The purchaser can specify requirements, within the range of EN 60529, in excess of these minima.

## 5 Test methods

### 5.1 Test conditions

Test conditions for all tests, unless otherwise specified, shall conform to EN 12899-1:2007, 4.1.1.1.

### 5.2 Test samples

Test samples shall be conducted on finished signs or on prepared samples representative of finished products and suitable for the test equipment.

### 5.3 Preparation of test samples and test panels

Test panels shall, unless otherwise specified, be prepared by cutting a piece 150 mm × 100 mm from samples selected in accordance with 5.2. Test samples shall be conditioned in accordance with EN ISO 139 and shall be identified on the back to demonstrate this.

### 5.4 Daylight chromaticity and luminance factor – Non-retroreflective material

Measurements shall be made in accordance with EN 12899-1:2007, 7.3.1.3.

### 5.5 Daylight chromaticity and luminance factor – Retroreflective material

Measurements shall be made in accordance with EN 12899-1:2007, 4.1.1.3.

### 5.6 Deflection test

#### 5.6.1 Resistance to deflection – class IR0 (rigid) and IR1 (breakaway)

**5.6.1.1** Mount the complete TTB under test with its base fixed to a rigid surface, using the appropriate holding down bolts, so that the normal vertical axis is horizontal.

**5.6.1.2** For type 1 TTBs, gradually load the head with a mass of 150 kg uniformly distributed over a circular area of 270 mm diameter centred on the traffic sign or plain surface.

For type 2 TTBs, gradually load the body with a mass of 150 kg uniformly distributed over a circular area of 270 mm diameter centred 185 mm below the upper extremity and midway between the sides.

**5.6.1.3** For all TTBs, maintain the load for not less than 30 s then measure the permanent (residual) deflection of the upper extremity within not less than 30 s or more than 60 s after removal of the load.

**5.6.1.4** Repeat the test on the other sides in turn.

#### 5.6.2 Resistance to deflection class IR2 (spring-back)

**5.6.2.1** Mount the complete TTB under test with its base fixed to a rigid surface, using the appropriate holding down bolts, so that it stands vertically.

**5.6.2.2** Apply sufficient force to the top of the TTB to pull it to an angle of 45° from the vertical and retain for 30 s. Allow the TTB to return to rest after removal of the load. Reapply and remove the test load two more times in the same direction. Measure the permanent (residual) deflection of the upper extremity within not less than 30 s or more than 60 s after removal of the final test load.

**5.6.2.3** Rotate the TTB through 180° and repeat the test, applying and removing the load three times, as before. Measure the permanent (residual) deflection of the upper extremity within not less than 30 s or more than 60 s after removal of the final test load.

### **5.6.3 Resistance to deflection - class IR3 (deformable)**

**5.6.3.1** Condition the test TTB to  $(0 \begin{smallmatrix} +3 \\ -0 \end{smallmatrix})$  °C for 4 h.

**5.6.3.2** Mount the complete TTB under test with its base fixed to a rigid surface, using the appropriate holding down bolts, so that it stands vertical.

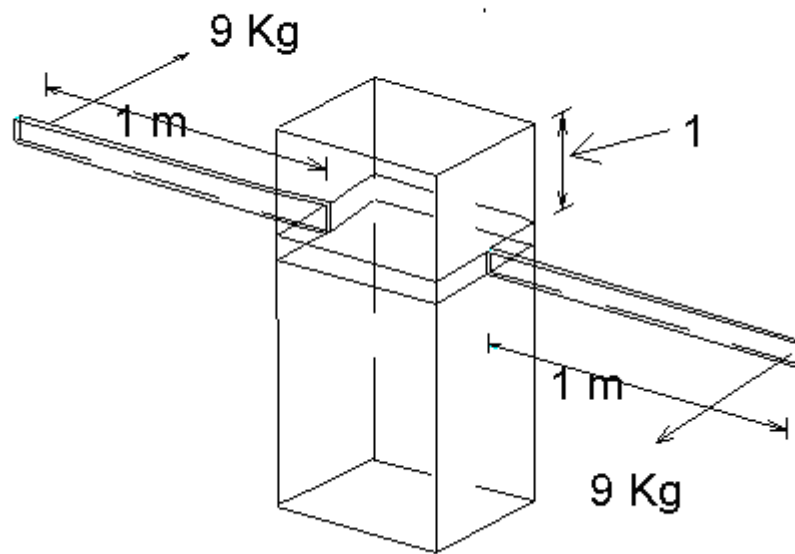
**5.6.3.3** Apply a load to the TTB at a height of 400 mm above the ground line in a horizontal direction at a rate of  $0,2 \text{ m}\cdot\text{s}^{-1}$  using a bar of  $(50 \pm 5)$  mm diameter pulled in a plane at 90° to the vertical axis of the TTB. The bar shall pass completely over the TTB allowing it to return to its original position. Repeat this procedure two more times. Measure the permanent (residual) deflection of the upper extremity within not less than 10 min or more than 15 min after removal of the final test load.

**5.6.3.4** Rotate the same test TTB through 180° and repeat the procedure defined in 5.6.3.3.

### **5.6.4 Torsion test**

**5.6.4.1** Mount the complete TTB under test with its base fixed to a rigid surface, using the appropriate holding down bolts, so that it stands vertically.

**5.6.4.2** Clamp a frame, 25 mm deep, over the top of the TTB so that the torsion load can be applied without bending in the vertical plane (see Figure 3).



### Key

- 1 Half height of head or 150 mm whichever is the lesser

**Figure 3 — Torsion test equipment**

**5.6.4.3** Apply a torsion load of 90 Nm in the horizontal plane with the frame centred on the vertical axis and not more than half the height of the head or 150 mm from the upper extremity whichever is the lesser. Remove the load and measure the permanent angular deflection at the point of application of the test load.

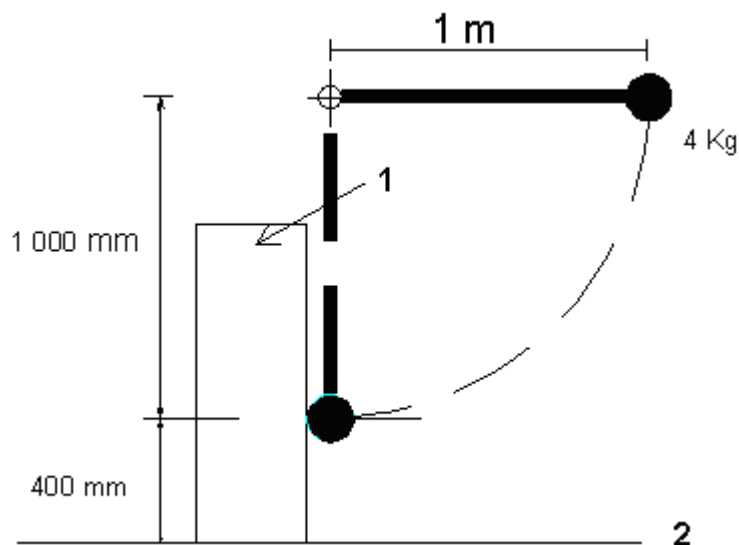
### 5.6.5 Impact

#### 5.6.5.1 Low impact

**5.6.5.1.1** Condition the test TTB to  $(0 \begin{smallmatrix} +3 \\ -0 \end{smallmatrix})$  °C for 4 h.

**5.6.5.1.2** Mount the test TTB with its base fixed to a rigid surface, using the appropriate holding down bolts, so that the TTB stands vertical.

**5.6.5.1.3** Using the equipment shown in Figure 4 with the arm of the apparatus horizontal before release, apply an impact with a mass of 4 kg to the front face of the test TTB centred on a point 400 mm above the ground line and midway between the sides. Measure the permanent (residual) deflection of the upper extremity within not less than 30 s or more than 60 s after impact.



**Key**

- 1 TTB under test
- 2 Ground line

**Figure 4 — Impact test**

**5.6.5.1.4** Repeat the test at similar points on the other sides in turn.

**5.6.5.1.5** For TTBs with a non-rectangular horizontal cross-section, apply the impact to four points so that the centre line of the impact passes through the centre line of the TTB, 400 mm above the ground line and 90° apart in plan. Determine the mean permanent deflection.

**5.6.5.2 High impact**

**5.6.5.2.1** Condition the test TTB to  $(0 \begin{smallmatrix} +3 \\ -0 \end{smallmatrix})$  °C for 4 h.

**5.6.5.2.2** Using a simulated vehicle bumper made from 106 mm × 51 mm steel channel aligned horizontally and centred on a point 400 mm above the ground line, apply an impact with a mass of 1 000 kg at 5 m·s<sup>-1</sup> to the front face of the TTB. Arrange the test so that the simulated bumper makes contact across the full width of the TTB.

**5.6.6 Scratch resistance**

**5.6.6.1** Condition a sample of the sign face at  $(23 \begin{smallmatrix} +3 \\ -0 \end{smallmatrix})$  °C for 4 h.

**5.6.6.2** Draw a mild steel bar, of cross-section 10 mm × 2 mm with radius of 0,25 mm on its edges and corners. Hold the bar so that its longitudinal axis is at 30° to the face of the test sample. With the 2 mm side in contact with the sample and the 10 mm side vertical, draw the bar across the face of the test sample with a pressure of 10 N. Examine visually.



### 5.6.7 Natural weathering

Test samples, 150 mm × 150 mm shall be exposed for two years, inclined at an angle of 45° to the horizontal and facing the equator, in accordance with EN ISO 877:1996, Method A. The samples shall be representative of the material and production process used for the TTB.

After two years, condition the test sample at (0 ± 5) °C for 24 h and carry out the following tests.

Measure the chromaticity coordinates and luminance factor of the sample and compare them with the same values measured on an untreated sample.

Place the sample over spacers at 100 mm spacing and drop a solid steel ball of mass 0,45 kg vertically on to the centre of the sample, from a height of 250 mm. Examine the sample for signs of damage.

## 6 Marking, labelling and product information

### 6.1 Marking and labelling

Voluntary marking shall be affixed in such a way as to avoid obscuring or causing confusion with regulatory marking.

NOTE Regulatory marking requirements are given in ZA.3.

### 6.2 Product information

The manufacturer or supplier shall make available the following information:

- a) instructions for assembly and installation, including whether holding down bolts are required if the base incorporates horizontal flanges not less than 100 mm below the ground line;
- b) details of any limitations on location or use;
- c) instructions on the operation, maintenance and cleaning of the sign, including lamp replacement procedures
- d) information with the product specifying that its fitness for use is based upon foundations of adequate size, strength and durability to withstand the effects of salt, impact, frost and weathering. The foundations should also be of sufficient size to retain any holding down bolts.

## 7 Evaluation of conformity

7.1 The conformity of a transilluminated traffic bollard with the requirements of this standard and with the stated values (including classes) shall be demonstrated by:

- a) initial type testing in accordance with EN 12899-5;
- b) factory production control by the manufacturer in accordance with EN 12899-4.

7.2 For the purposes of testing, the transilluminated traffic bollards may be grouped into families, where it is considered that the selected characteristics are common to all the transilluminated traffic bollards in that family.

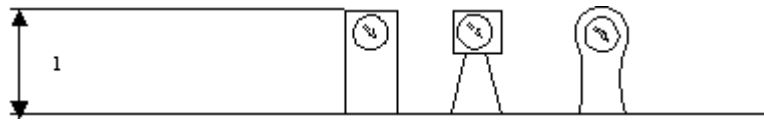
7.3 A FPC system conforming to the requirements of EN ISO 9001, and made product specific to the requirements of this standard, shall be considered to satisfy the FPC requirements.

## **8 Dangerous substances**

Materials used in products shall not release any dangerous substances in excess of the maximum permitted levels specified in a relevant European Standard for the material or permitted in the national regulations of the member state of destination.

**Annex A**  
(informative)

**Illustration of TTB types**



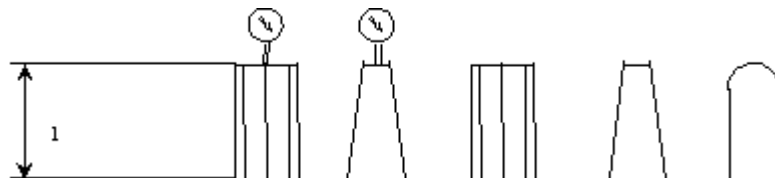
**Key**

1 Overall height

**Figure A.1a — Front elevation – type 1 TTB containing traffic signs**



**Figure A.1b — Plan – type 1 TTB containing traffic signs**



**Key**

1 Overall height

**Figure A.2a — Front elevation – type 2 TTB supporting signs and without signs**



**Figure A.2b — Plan – type 2 TTB supporting signs and without signs**

**Annex ZA**  
(informative)

**Clauses of this European Standard addressing the provisions of  
the 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 European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Conformity to these clauses confers a presumption of fitness of transilluminated bollards, covered by this annex for the intended uses 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 uses, can be applicable to the transilluminated bollards falling within the scope of this European Standard.

NOTE 1 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 conformed to, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (accessed through <http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm>).

This annex establishes the conditions for the CE marking of construction products intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable:

This annex has the same scope as Clause 1 of this standard and is defined by Table ZA.1.

**Table ZA.1 — Relevant clauses for transilluminated bollards, installed permanently for the information, guidance, warning and direction of road users**

Product: transilluminated traffic bollards			
Intended use: traffic bollards installed permanently for the information, guidance, warning and direction of road users			
<b>Essential characteristics</b>	<b>Requirement clauses in this and other European Standards</b>	<b>Mandated levels and/or classes</b>	<b>Notes including methods of evaluation and units of measurement</b>
<b>Resistance to horizontal loads</b> (static resistance to deflection)	4.3.1	None	Pass/fail (separate test for each type of bollard)
<b>Performance under vehicle impact</b> (passive safety)	4.3.2	None	Pass/fail (low and high impact specified)
<b>Visibility characteristics</b>			
Chromaticity coordinates and luminance factor	4.2.2	None	Pass/fail (separate values for opaque, retroreflective and transilluminated areas)
Retroreflectivity (if needed)	4.2.4	None	Pass/fail
Luminance (mean luminance and uniformity of luminance)	4.2.3.2	None	Pass/fail ( $\text{cd/m}^2$ ) 3 classes of mean luminance and 3 classes of uniformity of luminance
<b>Durability</b>			
Resistance to corrosion Metals	(EN 12899-1:2007) 4.3.3	None	
Resistance to UV radiation (accelerated natural weathering test)	5.6.7	None	Pass/fail
Resistance to penetration of dust and water	4.3.5	None	Declared value (class minimum value of 2.3 or as required by purchaser)
<b>Dangerous substances</b>	8	None	

The requirement for a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements for 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.

**ZA.2 Procedure for attestation of conformity of transilluminated bollards**

The system of attestation of conformity of transilluminated traffic bollards indicated in Table ZA.1, in accordance with the decision of the commission [96/579/EC] of 1996-06-24 as given in Annex III of the mandate for circulation fixtures, is shown in Table ZA.2 for the indicated intended use.

**Table ZA.2 — System of attestation of conformity**

Product	Intended use	Levels or classes	Attestation of conformity system(s)
Transilluminated traffic bollards	For the information, guidance, warning and direction of road users		1
System 1: See Directive 89/106/EEC (CPD) Annex III.2(i), without audit testing of samples			

The attestation of conformity of the transilluminated traffic bollards in Table ZA.1 shall be based on the evaluation of conformity procedure indicated in Table ZA.3 resulting from application of the clauses of EN 12899-5 and EN 12899-4 indicated therein.

**Table ZA.3 — Assignment of evaluation of conformity tasks**

Tasks	Content of the task	Evaluation of conformity clauses to apply
Responsibility of the manufacturer	Factory production control (FPC)	Parameters related to all relevant characteristics of Table ZA.1
	Testing of samples taken at factory	All characteristics of Table ZA.1
Responsibility of the product certification body	Initial type testing	All characteristics of Table ZA.1
	Initial inspection of factory and of FPC	Parameters related to all relevant characteristics of Table ZA.1
	Continuous surveillance, assessment and approval of FPC	Parameters related to all relevant characteristics of Table ZA.1

**ZA.2.1 EC Certificate and declaration of conformity**

When compliance with the conditions of this annex is achieved, the certification body shall draw up a certificate of conformity (EC Certificate of conformity), which entitles the manufacturer to affix the CE marking. The certificate shall include:

- a) name, address and identification number of the certification body;
- b) name and address of the manufacturer, or an authorized representative established in the EEA, and place of production;

- c) description of the product (type, identification, use);
- d) provisions to which the product conforms (i.e. Annex ZA of this standard);
- e) particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);
- f) number of the certificate;
- g) conditions and period of validity of the certificate, where applicable;
- h) name of and position held by the person empowered to sign the certificate.

In addition, the manufacturer shall draw up a declaration of conformity (EC Declaration of conformity) including the following:

- i) name and address of the manufacturer, or an authorized representative established in the EEA;
- j) name and address of the certification body;
- k) description of the product (type, identification, use) and a copy of the information accompanying the CE marking;
- l) provisions to which the product conforms (i.e. Annex ZA of this standard);
- m) particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions);
- n) number of the accompanying EC Certificate of conformity;
- o) name of and position held by the person empowered to sign the declaration on behalf of the manufacturer or of the authorized representative.

The above mentioned declaration and certificate shall be presented in the official language or languages accepted by the Member State in which the product is to be used.

### **ZA.3 CE marking and labelling**

The manufacturer or an 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/EEC and shall be shown on the transilluminated traffic bollard as indicated below. The following information shall accompany the CE marking symbol:

- a) identification number of the certification body;
- b) name or identifying mark and registered address of the producer;
- c) last two digits of the year in which the marking is affixed;
- d) number of the EC Certificate of conformity;
- e) reference to this European Standard [EN 12899-2:2007];
- f) description of the product: generic name, material, dimensions and intended use;
- g) information about those relevant essential characteristics listed in Table ZA.1 which are to be declared;

- h) declared values and, where relevant, the level or class (including "pass" for pass/fail requirements, where necessary) to declare for each essential characteristic as indicated in "Notes" in Table ZA.1;
- i) "No performance determined" for characteristics where this is relevant.

The NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

The information to be supplied and its location shall be:

**On the product**


1. "CE" symbol
2. name or identifying mark of the manufacturer
3. number and year of this European Standard

**In the accompanying commercial documents**

1. all information on the product
2. identification of the type of product in accordance with this standard, e.g. spring-back
3. registered address of the producer
4. last two digits of the year in which the product was manufactured
5. reference of the notified body and the number of EC certificate of conformity
6. identification of the characteristics of the product.

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.



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<p style="text-align: center;"><b>EN 12899-2:2007</b></p> <p>Transilluminated traffic bollards installed permanently for the information, guidance, warning and direction of road users</p> <p><b>Resistance to horizontal loads</b> – pass</p> <p><b>Performance under vehicle impact</b> (passive safety) – pass</p> <p><b>High impact</b> – pass</p> <p><b>Visual performance</b></p> <p>Chromaticity coordinates – NR 1 – pass</p> <p>Coefficient of retroreflection – RA2 – pass</p> <p>Luminance – L2/U2 – pass</p> <p><b>Durability</b></p> <p>Resistance to corrosion – SP1</p> <p>Resistance to UV (accelerated natural weathering test) – pass</p> <p>Resistance to penetration of dust and water (IP rating as class) – declared value – IP56</p> <p><b>Dangerous substances</b> – NPD</p>

*CE conformity marking, consisting of the “CE”-symbol given in Directive 93/68/EEC.*

*Last two digits of the year in which the marking was affixed*

*Identification number of the certification body (where relevant)*

*Name or identifying mark and registered address of the producer*

*Certificate number (where relevant)*

*No. of European Standard*

*Description of product*

*and*

*information on regulated characteristics*

Figure ZA.1 — Example of CE marking information

## **EN 12899-2:2007 (E)**

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

NOTE European legislation without national derogations need not be mentioned.