

# SVENSK STANDARD

## SS-EN 16276:2013



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### Utrymningsbelysning i vägtrafiktunnlar

### Evacuation Lighting in Road Tunnels

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EUROPEAN STANDARD

**EN 16276**

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2013

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ICS 93.080.40

English Version

## Evacuation Lighting in Road Tunnels

Éclairage des itinéraires d'évacuation dans les tunnels  
routiers

Evakuierungsbeleuchtung in Straßentunneln

This European Standard was approved by CEN on 1 December 2012.

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-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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## **Foreword**

This document (EN 16276:2013) has been prepared by Technical Committee CEN/TC 169 “Light and lighting”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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## **Introduction**

The Directive 2004/54/EC of the European Parliament of 29 April 2004 aims at ensuring a minimum level of safety for road users in tunnels in the Trans-European Network by the prevention of critical events that may endanger human life. With regard to lighting, there are two main cases: normal lighting and safety lighting.

Normal lighting is provided to ensure appropriate visibility during the day and night for drivers in the entrance zone as well as in the interior zone.

Safety lighting is divided into two parts: standby lighting and evacuation lighting.

Standby lighting is provided to ensure a minimum visibility for tunnel users to evacuate the tunnel in their vehicles in the event of a breakdown of the power supply.

Evacuation lighting is provided to guide tunnel users during evacuation of the tunnel on foot in emergency circumstances such as fire. Evacuation lighting includes evacuation route marker lights, emergency exit lighting, emergency exit marker lights and evacuation route lighting.



## 1 Scope

This European Standard specifies evacuation lighting in road tunnels longer than 500 m and with an AADT (Annual Average Daily Traffic) higher than 500 vehicles to facilitate the safe evacuation of vehicle occupants in evacuation situations such as fire. It addresses the fundamental issues of evacuation lighting for evacuation routes, emergency exits and cross connections, as well as giving some practical advice regarding aspects of installation and maintenance in road tunnels. It is intended to be used in conjunction with CEN/CR 14380:2003 or relevant national standards for road tunnel lighting.

The recommendations may be applied to tunnels up to 500 m in length, especially where conditions such as high traffic volume, or severe curvature or gradient apply.

It specifies lighting levels and general provisions for evacuation lighting installations that, based on experience, are considered to be necessary for the safety of people driving through road tunnels in case of an incident and particularly in case of fire. However, as there are different types of road tunnels, both in construction and traffic conditions, various types of incident may occur. This standard should be considered as a list of minimum prescriptions for evacuation lighting in tunnels, to be completed by means of specific risk analysis for the particular tunnel.

The design of marking and safety signs is not part of this standard.

## 2 Normative references

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

EN 1838:1999, *Lighting applications — Emergency lighting*

EN 12665:2011, *Light and lighting — Basic terms and criteria for specifying lighting requirements*

EN 50172:2004, *Emergency escape lighting systems*

CEN/CR 14380:2003, *Lighting applications — Tunnel Lighting*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12665:2011, EN 1838:1999 and the following apply.

### 3.1 Tunnel construction aspects

#### 3.1.1

##### **main tunnel**

part of a tunnel which contains the carriageway

#### 3.1.2

##### **carriageway**

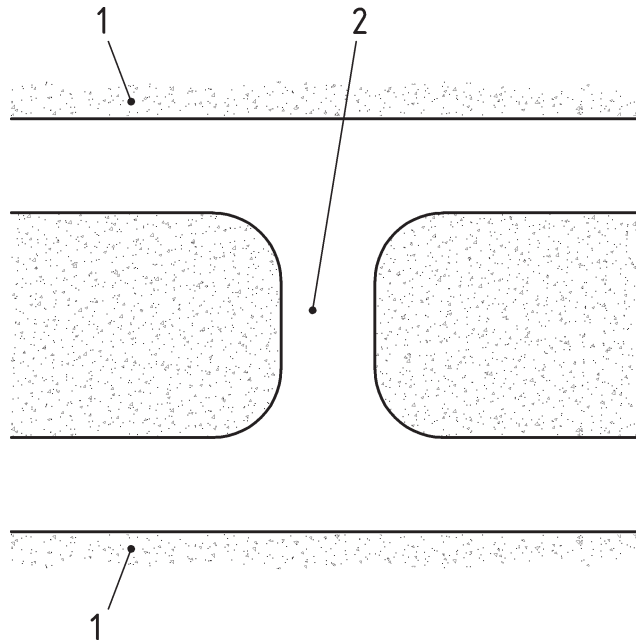
part of the road used by vehicular traffic, normally divided into lanes

#### 3.1.3

##### **vehicular cross connections (between tunnel tubes)**

vehicular carriageway connecting adjacent tubes

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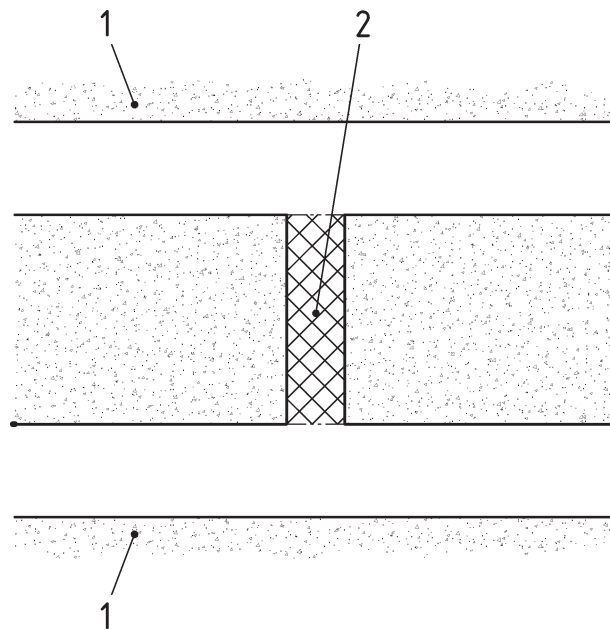


**Key**

- 1 main tunnel
- 2 vehicular cross connection

**Figure 1 — Vehicular cross connection**

**3.1.4 pedestrian cross connections (between tunnel tubes)**  
pedestrian route connecting adjacent tubes



**Key**

- 1 main tunnel
- 2 pedestrian cross connection

**Figure 2 — Pedestrian cross connection**

**3.1.5**

**evacuation route within the main tunnel**

pedestrian route from a stationary vehicle to an emergency exit

**3.1.6**

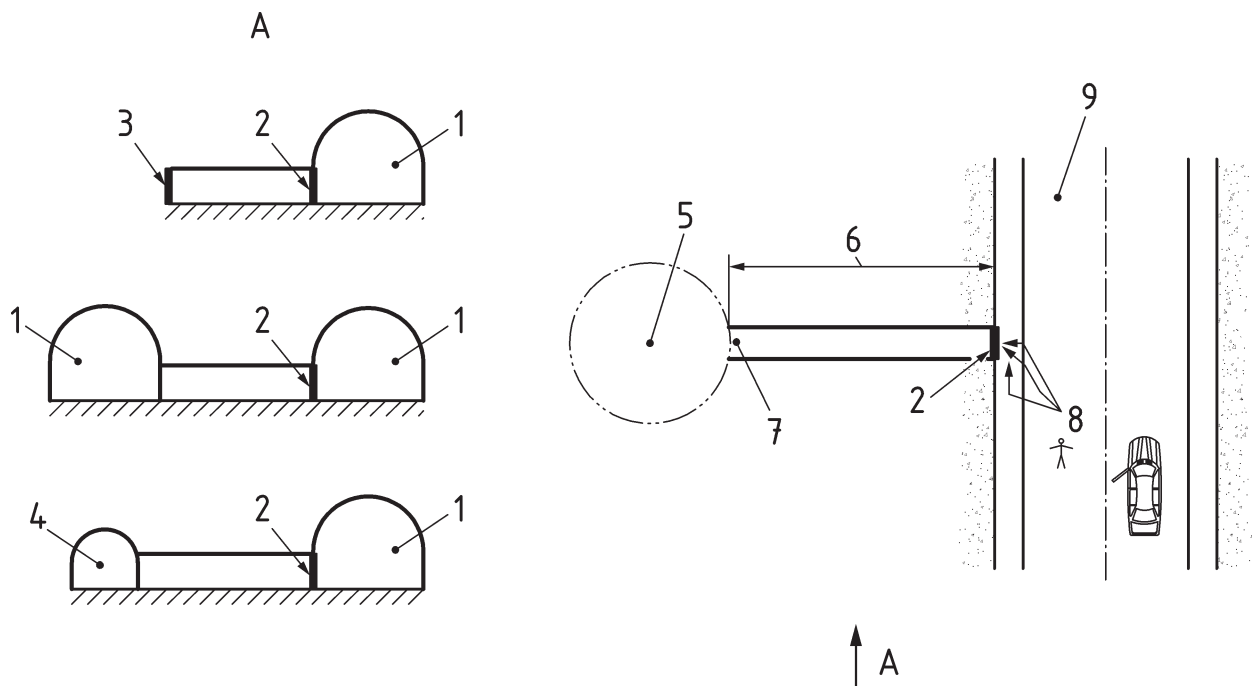
**emergency exit**

exit intended to be used by pedestrians to escape from the main tunnel to a safe area (directly or via an evacuation route)

**3.1.7**

**evacuation route outside the main tunnel**

pedestrian route after an emergency exit



**Key**

- 1 main tunnel
- 2 emergency exit
- 3 outdoor
- 4 safety gallery
- 5 safe area
- 6 evacuation route outside the main tunnel
- 7 final exit
- 8 evacuation route within the main tunnel
- 9 carriageway

**Figure 3 — Tunnel construction examples**

**3.2 Road tunnel evacuation lighting terms**

**3.2.1**

**standby lighting**

part of the normal lighting that maintains the tunnel lighting at a specific level in the event of a breakdown of the power supply

Note 1 to entry: Standby lighting is called emergency lighting in CEN/CR 14380:2003.