



SLOVENSKI STANDARD
SIST EN 13356:2001
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Visibility accessories for non-professional use - Test methods and requirements

Warn-Zubehör für den nichtprofessionellen Bereich - Prüfverfahren und Anforderungen

Accessoires de visualisation pour usage non-professionnel - Méthodes d'essai et exigences

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Ta slovenski standard je istoveten z: EN 13356:2001

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ICS:

13.340.01	Varovalna oprema na splošno	Protective equipment in general
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en

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ICS 13.340.01

English version

Visibility accessories for non-professional use - Test methods and requirements

Accessoires de visualisation pour usage non-professionnel
- Méthodes d'essai et exigences

Warn-Zubehör für den nichtprofessionellen Bereich -
Prüfverfahren und Anforderungen

This European Standard was approved by CEN on 4 June 2001.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 162, "Protective clothing including hand and arm protection and lifejackets", 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of an identical text or by endorsement, at the latest by January 2002, and conflicting national standards shall be withdrawn at the latest by January 2002.

This European Standard 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).

Annex A is normative and contains test method for brushing according to 5.3.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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.

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0 Introduction

This European Standard relates to products primarily intended to be worn or carried by individuals to make them more conspicuous to other road users under low light levels. The products rely upon retro-reflection for their performance. The products can be regarded as aids to conspicuity that perform best in circumstances of very low ambient lighting. On lit urban roads, products conforming to EN 471 : 1994 or EN 1150 are necessary to provide conspicuity. In any circumstance in which the failure of a vehicle driver to become aware of another road user could result in the serious injury or death of that road user, only high conspicuity garments can be recommended for use. Products conforming to this European Standard have a utility when their movement and retro-reflection attract observers' attention.

1 Scope

This standard specifies the optical performance requirements for accessories which are to be worn, attached to or carried by people and designed for non-professional use. Visibility accessories complying with this standard are intended to signal the user's presence visually when illuminated by vehicle headlight on dark roads. This standard is not applicable to garments.

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 471 : 1994

High-visibility warning clothing

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EN 1150

Protective clothing - Visibility clothing for non-professional use - Test methods and requirements

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EN ISO 3175 : 1995

Textiles - Evaluation of stability to machine dry-cleaning (ISO 3175:1995)

EN ISO 6330 : 2000

Textiles - Domestic washing and drying procedures for textile testing (ISO 6330:2000)

CIE 17.4 :1987

International lighting vocabulary – Chapter 845: Lighting

CIE 18.2 : 1983

The basis of physical photometry

CIE 54 :1982

Retroreflection: Definition and measurement

IEC 60068-2-32

Basic environmental testing procedures – Part 2: Tests – Test Ed: Free fall

ISO 4675

Rubber- or plastics-coated fabrics - Low-temperature bend test

3 Terms and definitions

For the purposes of this standard the definitions for photometric terms according to CIE 17.4 : 1987, CIE 18.2 : 1983 and CIE 54 : 1982 and the following definitions apply:

3.1

accessory

retroreflector to be used as an aid to enhance conspicuity and is a product other than a garment

3.2

type 1 - free hanging accessory

an item suspended from a garment or part of the body which is capable of hanging freely and of being removed by a conscious action

NOTE Type 1 fasteners should be produced so that if subject to undue force they separate from the garment or body from which they are suspended.

3.3

type 2 - removable accessory

an item which is temporarily attached to a garment or on to part of the body and is removable without the aid of tools. Requirements of type 2 reflectors should be specified by Table 2

3.4

type 3 - mounted accessory

an item manufactured to be permanently affixed

3.5

flexible accessory

accessory capable of being wound around a 25 mm mandrel in all orientations without any visible deformation

3.6

rigid accessory

accessory not capable of being wound around a 25 mm mandrel in all orientations without any visible deformation

3.7

orientation sensitive material

material having coefficients of retroreflection that differ by more than 15 % when measured at the two rotation angles $\varepsilon_1 = 0^\circ$ and $\varepsilon_2 = 90^\circ$

4 Requirements for accessories

4.1 General requirements

The accessories shall meet requirements of area as well as retroreflection. When mounting the retroreflector on a garment, the area of the accessory shall be such so that the requirements for the retroreflective value are met. The area of a type 1 - accessory shall be between 15 cm² and 50 cm² per side. If the type 1 - accessory is only retroreflective from two sides the thickness shall be maximum 10 mm. Each type 2- and type 3 - accessory shall exceed the area of 15 cm².

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4.2 Specific requirements for different types of accessories

4.2.1 General

Depending on the type of accessories, the requirements below supplement the general requirements in 4.1.

4.2.2 Photometric requirements

The accessories shall achieve the minimum retroreflective values given either in Table 1 or Table 2.

Table 1 - Minimum coefficient of luminous intensity R (CIL) for free hanging type 1- accessories

coefficient of luminous intensity R in mcd/lx

Observation angle α	Entrance angle β		
	$\beta_1 = 0^\circ$ $\beta_2 = \pm 5^\circ$	$\beta_1 = \pm 10^\circ$ $\beta_2 = 0^\circ$	$\beta_1 = 0^\circ$ $\beta_2 = \pm 20^\circ$
0,2° (12')	560	350	280
0,33° (20')	400	250	200
1,5° (1°30')	20	10	10

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Table 2 - Minimum coefficients of specific retroreflection value R' for type 2 and type 3 - accessories

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retroreflecrive value R' in cd/lx m²

Observation angle α	Entrance angle β (Measurement only + entrance angle β_1)	
	$\beta_1 = + 5^\circ$ $\beta_2 = 0^\circ$	$\beta_1 = + 20^\circ$ $\beta_2 = 0^\circ$
0,2° (12')	110	80
0,33° (20')	80	60
1,5° (1°30')	4	3

The minimum area for type 2 and type 3 accessories shall meet the minimum CIL value R = 400 mcd/lx in all directions around the person at $\alpha = 0,33^\circ$, $\beta_1 = + 5^\circ$.

4.2.3 Abrasion resistance (brushing resistance)

After testing in accordance with 5.3, the photometric requirements given in Table 1 or Table 2 shall be met.

4.2.4 Washing and dry cleaning requirements

After testing in accordance with 5.4.2 or 5.4.3, the photometric requirements given in Table 1 or Table 2 shall be met.

4.2.5 Durability against heat

After testing in accordance with 5.6, the photometric requirements given in Table 1 or Table 2 shall be met.

4.2.6 Low temperature requirements (folding)

After testing in accordance with 5.5.1, the photometric requirements given in Table 1 or Table 2 shall be met.

4.2.7 Exposure to water

After testing in accordance with 5.7.1, the photometric requirements given in Table 1 or Table 2 shall be met and no visible water penetration is allowed.

4.2.8 Influence of rainfall

During the test in accordance with 5.7.2, the photometric requirements given in Table 1 or 2 shall be met at the entrance angle $\beta_1 = +5^\circ$ and $\beta_2 = 0^\circ$ and the observation angle α is $0,2^\circ$.

If material is orientation sensitive when dry, measurements shall be made at the rotation angle which gave the lowest measured performance when dry.

5 Testing

5.1 General

The samples tested in accordance with 5.2 shall be exposed as specified in Table 3 and Table 4 depending on the types of accessories. After exposure each test specimen shall fulfil the photometric requirements given in Table 1 for type 1 accessories or Table 2 for type 2 and type 3 accessories (at the entrance angle $\beta_1 = +5^\circ$ and $\beta_2 = 0^\circ$ and observations angle $\alpha = 0,2^\circ$).

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Preconditioning in accordance with EN 471:1994.

Table 3 - Test exposure for rigid accessories

Exposure	Test sample									
	1		2		3		4			
5.3 Abrasion test (brushing)	x									
5.5.2 Free fall test (according to IEC 60068-2-32)			x							
5.6 High temperature test	x		x		x		x			
5.7.1 Influence of water (water immersion)			X ^a		x					
5.7.2 Influence of rainfall (Type 3)							x			
5.2 Photometric testing	x		x		x		x			
^a for type 1 only										