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Vervangt NEN-EN 471:1994; NEN-EN 471:2000 Ontw.

Nederlandse norm

# **NEN-EN 471** (en)

High-visibility warning clothing for professional use - Test methods and requirements

ICS 13.340.10  
oktober 2003

Als Nederlandse norm is aanvaard:  
- EN 471:2003, IDT

Normcommissie 302 094 "Persoonlijke beschermingsmiddelen"

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EN 340	NEN-EN 340	Beschermende kleding - Algemene eisen (en)
EN 530:1994	NEN-EN 530:1994	Schuurvastheid van materiaal voor beschermende kleding - Beproevingsmethoden (en)
EN 31092	NEN-ISO 11092	Textiel - Bepaling van de fysiologische eigenschappen - Meting van de weerstand tegen doordringen van warmte en waterdamp onder stationaire omstandigheden ("sweating guarded - hotplate test") (en)
EN ISO 3175-2:1998	NEN-EN-ISO 3175-2:1998	Textiel - Chemische reiniging en nabehandeling - Deel 2: Werkwijze voor tetrachlooretheen (en)
EN ISO 6330:2000	NEN-EN-ISO 6330:2001	Textiel - Huishoudelijke was- en droogprocedures voor de beproeving van textiel (en)
EN ISO 7854:1997	NEN-EN-ISO 7854:1997	Met rubber of kunststof bedekte weefsels - Bepaling van de weerstand tegen beschadiging door buigen (en)
EN ISO 13934-1	NEN-EN-ISO 13934-1	Textiel - Trekeigenschappen van weefsels - Deel 1: Bepaling van de maximale trekkracht en de rek bij de maximale kracht met gebruik van de stripmethode (en)
EN ISO 13938-1	NEN-EN-ISO 13938-1	Textiel - Bersteigenschappen van weefsels - Deel 1: Hydraulische methode voor de bepaling van de berststerkte en de berstuitzetting (en)
ISO 105-A02	NEN-ISO 105-A02	Textiel - Beproeving van de kleurechtheid - Deel A02: Grijsschaal voor de bepaling van de kleurverandering (en)
ISO 105-A03	NEN-ISO 105-A03	Textiel - Beproeving van de kleurechtheid - Deel A03: Grijsschaal voor de bepaling van het uitvloeien (en)
ISO 105-B02:1994	NEN-EN-ISO 105-B02:1999	Textiel - Beproeving van de kleurechtheid - Deel B02: Kleurechtheid bij kunstlicht: Proef met xenonbooglamp (en)
ISO 105-C06	NEN-EN-ISO 105-C06	Textiel - Beproeving van de kleurechtheid - Deel C06: Bepaling van de kleurechtheid bij huishoudelijk en industrieel wassen (en)
ISO 105-D01	NEN-EN-ISO 105-D01	Textiel - Beproeving van de kleurechtheid - Deel D01: Kleurechtheid bij chemisch reinigen (en)
ISO 105-E04	NEN-EN-ISO 105-E04	Textiel - Beproeving van de kleurechtheid - Deel E04: Kleurechtheid tegen zweet (en)
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ISO 105-X11	-	-
ISO 105-X12	NEN-EN-ISO 105-X11	Textiel - Beproeving van de kleurechtheid - Deel X11: Kleurechtheid tegen warmpersen (en)
ISO 4674:1977	-	-
ISO 4675	-	-
ISO 15797:2002	NEN-EN-ISO 15797:2003 Ontw.	Textiel - Industriële was- en nabehandelingsprocedures voor het beproeven van werkkleding (en)



English version

High-visibility warning clothing for professional use - Test  
methods and requirements

Vêtements de signalisation à haute visibilité - Méthode  
d'essai et exigences

Warnkleidung - Prüfverfahren und Anforderungen

This European Standard was approved by CEN on 1 August 2003.

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Preview

## Foreword

This document (EN 471:2003) 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 March 2004, and conflicting national standards shall be withdrawn at the latest by March 2004.

This document supersedes EN 471:1994.

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 document.

Annexes C and D are normative and Annexes A and B are informative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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

This European Standard provides a solution that enables the major issues to be resolved. The performance of the conspicuous materials to be used in "high visibility clothing" is specified together with minimum areas and placement of the materials.

Conspicuity is enhanced by high contrast between the clothing and the ambient background against which it is seen, and by larger areas of the conspicuous materials specified.

Three areas of background and combined performance material colours are defined in an appropriate manner for clothing material, all of which will confer conspicuity against most backgrounds found in urban and rural situations in daylight. However users should consider the prevailing ambient background in which protection is required and select the colour that provides the preferred contrast.

Two levels of separate performance retroreflective materials are included. Higher levels of retroreflection provide greater contrast and visibility of warning clothing when seen in headlights during darkness. When greater conspicuity is required the higher level of retroreflecting material should be used.

Design requirements illustrating the disposition of retroreflective materials are included within the standard. The ergonomics of the wearer should be considered when selecting the most appropriate configuration of retroreflective materials within the garment.

Three classes of warning clothing are specified in terms of the minimum areas of the materials to be incorporated. Whilst the area comprising clothing is obviously dictated by the type of clothing and also the size of the wearer, it should be noted that class 3 clothing offers greater conspicuity against most urban and rural backgrounds than class 2 garments which in turn are significantly superior to class 1 clothing.

Selection and use of high-visibility warning clothing can vary among European countries. It should be based on a risk assessment of the condition in which the warning clothing is to be used. This will involve consideration of the requirements necessary for an observer to understand that a wearer is present. The observer needs both to perceive and to recognise the wearer and then to decide to take appropriate avoidance action. The wearing of a high-visibility garment does not guarantee that the wearer will be visible under all conditions.

Test methods ensure that a minimum level of protection is maintained when the garments are subjected to care procedures. Test methods detailed in this standard are for new materials and not intended for products in use.

Attention is drawn to EN 1150, which specifies characteristics and properties for visibility clothing for non-professional use.

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