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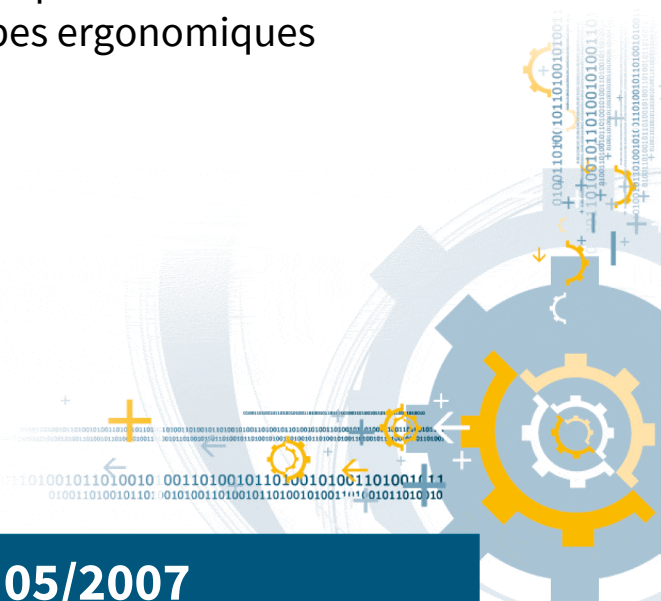
**ILNAS-EN 13921:2007**

**Personal protective equipment -  
Ergonomic principles**

Persönliche Schutzausrüstung -  
Ergonomische Grundsätze

Equipements de protection individuelle -  
Principes ergonomiques

**05/2007**



## National Foreword

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EUROPÄISCHE NORM  
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English Version

## Personal protective equipment - Ergonomic principles

Equipements de protection individuelle - Principes  
ergonomiques

Persönliche Schutzausrüstung - Ergonomische Grundsätze

This European Standard was approved by CEN on 15 March 2007.

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## Foreword

This document (EN 13921:2007) has been prepared by Technical Committee CEN/TC 122 “Ergonomics”, 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of an identical text or by endorsement, at the latest by November 2007, and conflicting national standards shall be withdrawn at the latest by November 2007.

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.

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 provides guidance for the writers of personal protective equipment (PPE) product standards on the specification of ergonomic requirements.

Ergonomics involves the application of scientific methods and appropriate data to the design and specification of machines, equipment, environments and systems that people use. The successful use of ergonomics in designing PPE will enhance the acceptability of the PPE and through this improve the safety, health, performance and effectiveness of the user.

PPE is used in situations where a risk to health or safety has been identified. The preferred solution is to reduce the risk to zero and thereby to remove the need for PPE. If this is not possible, the threat should be reduced so that practical PPE can minimise the risk to people exposed to that hazard. In some working conditions some PPE may be more comfortable than none and not to be considered as an additional weight (shoes etc.). Side effects of using PPE can range from discomfort to severe constraint and physical load. The application of ergonomic principles to PPE allows optimisation of the balance between protection and usability.

Some aspects of the design and specification of PPE require specialist knowledge of the particular job the PPE is used for; the particular hazard against which the PPE is to be effective or particular ergonomics issues. Although this European Standard covers many aspects, the writers of product standards should be aware that it cannot be expected to identify all the possible future problem points for which ergonomic requirements and test methods will be required in product standards. It will remain the responsibility of the relevant experts, to identify and quantify the hazards in the work and to foresee the potential ergonomic problems, and thus to ensure that the PPE specified and manufactured is fit for the purposes intended in all respects.

For practical reasons, this European Standard presents ergonomics factors separately. However, it should be recognised that the overall acceptability of an item of PPE will be determined by a combination of these and other factors by the individual user.

## 1 Scope

This European Standard provides guidance on the generic ergonomic characteristics related to personal protective equipment (PPE).

It presents for the writers of PPE product standards, principles relating to:

- anthropometric characteristics related to PPE;
- the biomechanical interaction between PPE and the human body;
- the thermal interaction between PPE and the human body;
- the interaction between PPE and the human senses: vision; hearing; smell and taste; and skin contact.

This European Standard does not cover requirements related to the specific hazard for which PPE is designed.

## 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 ISO 12894, *Ergonomics of the thermal environment — Medical supervision of individuals exposed to extreme hot or cold environments (ISO 12894:2001)*

## 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

### 3.1

#### **anthropometrics of PPE**

application of human body measurements to the design of PPE including variation in dimensions within the user group

### 3.2

#### **auditory aspects**

qualities which interfere with the users ability to hear

### 3.3

#### **biomechanics of PPE**

application of principles and methods from physics and engineering to describe the effect undergone by the human body and various body segments and the forces acting on these body segments including physical loading which may be caused by PPE

### 3.4

#### **body heat balance**

increase or decrease in the heat content of the body caused by an imbalance between heat production and heat loss, usually expressed in terms of unit area of total body surfaces