SLOVENSKI STANDARD
SIST EN ISO 18640-2:2018

01-julij-2018

Varovalna obleka za gasilce - Fiziološki vpliv - 2. del: Določanje fiziološke toplotne obremenitve, ki jo povzroča varovalna obleka, ki jo nosijo gasilci (ISO 18640-2:2018)

Protective clothing for firefighters - Physiological impact - Part 2: Determination of physiological heat load caused by protective clothing worn by firefighters (ISO 18640-2:2018)

Schutzkleidung für die Feuerwehr - Physiologische Wärmebelastung - Teil 2: Bestimmung der physiologischen Wärmebelastung ausgelöst durch von Feuerwehrleuten getragene Schutzkleidung (ISO 18640-2:2018)

Vêtements de protection pour sapeurs-pompiers - Impact physiologique - Partie 2: Détermination de la déperdition de chaleur provoquée par les vêtements de protection portés par les sapeurs-pompiers (ISO 18640-2:2018)

Ta slovenski standard je istoveten z: **EN ISO 18640-2:2018**

ICS:

13.220.10	Gašenje požara	Fire-fighting
13.340.10	Varovalna obleka	Protective clothing

SIST EN ISO 18640-2:2018 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 18640-2

May 2018

ICS 13.340.10

English Version

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN ISO 18640-2:2018) has been prepared by Technical Committee ISO/TC 94 "Personal safety - Personal protective equipment" in collaboration with 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of an identical text or by endorsement, at the latest by November 2018, and conflicting national standards shall be withdrawn at the latest by November 2018.

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The text of ISO 18640-2:2018 has been approved by CEN as EN ISO 18640-2:2018 without any modification.

INTERNATIONAL STANDARD

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Protective clothing for firefighters — Physiological impact —

Part 2: Determination of physiological heat load caused by protective clothing worn by firefighters

Vêtements de protection pour sapeurs-pompiers — Impact physiologique —

Partie 2: Détermination de la déperdition de chaleur provoquée par les vêtements de protection portés par les sapeurs-pompiers

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 14, *Firefighters' personal equipment*.

A list of all parts in the ISO 18640 series can be found on the ISO website.

Introduction

Protective clothing for (structural) firefighting may have a serious physiological impact[1),2)]on the wearer and a serious effect on the acute physical condition of the wearer during activities with increased metabolic heat production[3][4]. Protective clothing impedes heat exchange by sweat evaporation and therefore maintenance of a constant core body temperature and thermal homeostasis is disturbed. This could increase the risk of heat strain and subsequently impact on the length and time that the firefighter is able to work safely. If this is identified in a risk assessment, it is important that (thermal) physiological parameters are obtained to ensure the suitability of the protective clothing chosen under the expected conditions of use. The assessment of the physiological impact of the protective clothing provides important information about the effect on individuals undertaking different tasks in various environmental conditions. In ISO 18640-1, relevant physical parameters of protective clothing are measured with a Sweating torso. Standard Sweating torso measurements provide physical parameters about combined and complex heat and moisture transfer (ISO 18640-1). By coupling the sweating torso to a mathematical model for thermo-physiological responses, the thermo-physiological impact of protective clothing is estimated and the maximum exposure time for defined environmental conditions and a defined activity protocol are predicted by Thermal Human Simulator (THS) measurements.

The purpose of this document is to consider aspects of protective clothing performance that cannot be determined by tests described in other standards. The aim of this document is to quantify the thermo-physiological impact of protective garments for (structural) firefighting under relevant exposures. This document provides the background for the specification of a minimum level of performance requirements during defined firefighting scenarios for the assessed firefighters' protective clothing by calculation of the maximum allowable work duration in order to avoid heat stroke.

NOTE The method allows to characterizing the thermo-physiological impact for different levels of complexity. This includes the characterisation of the single PPE ensembles (standard procedure) as well as the characterisation of protective clothing ensembles including under wear and protective clothing, including air layers or including design features of protective clothing ensembles (e.g. pockets, reflective strips) as optional procedures[3)].

1) Nunneley (1989) reported a significant physiological burden due to the protective clothing upon the wearer, both in the form of increased metabolic rate and reduced heat dissipation.

2) Taylor (2012) showed that the relative influence of the clothing on oxygen cost was at least three times that of the breathing apparatus.

3) This listing of standard and optional procedures is a first proposal for prioritization. The expressiveness of the different levels of complexity for the characterisation of the thermo-physiological impact needs to be further investigated. Results will be presented at the next ballot.