EESTI STANDARD EVS-EN ISO 11092:2014

Textiles - Physiological effects - Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test) (ISO 11092:2014)

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA | **NATIONAL FOREWORD**

See Eesti standard EVS-EN ISO 11092:2014 sisaldab Euroopa standardi EN ISO 11092:2014 inglisekeelset teksti.	This Estonian standard EVS-EN ISO 11092:2014 consists of the English text of the European standard EN ISO 11092:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 03.09.2014.	Date of Availability of the European standard is 03.09.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 59.080.01

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 11092

September 2014

ICS 59.080.01

Supersedes EN 31092:1993

English Version

Textiles - Physiological effects - Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test) (ISO 11092:2014)

Textiles - Effets physiologiques - Mesurage de la résistance thermique et de la résistance à la vapeur d'eau en régime stationnaire (essai de la plaque chaude gardée transpirante) (ISO 11092:2014)

Textilien - Physiologische Wirkungen - Messung des Wärme- und Wasserdampfdurchgangswiderstands unter stationären Bedingungen (sweating guarded-hotplate test) (ISO 11092:2014)

This European Standard was approved by CEN on 18 July 2014.

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COMITÉ EUROPÉEN DE NORMALISATION
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Ref. No. EN ISO 11092:2014 E

Foreword

This document (EN ISO 11092:2014) has been prepared by Technical Committee ISO/TC 38 "Textiles" in collaboration with Technical Committee CEN/TC 248 “Textiles and textile products” the secretariat of which is held by BSI.

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 2015, and conflicting national standards shall be withdrawn at the latest by March 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 31092:1993.

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Endorsement notice

The text of ISO 11092:2014 has been approved by CEN as EN ISO 11092:2014 without any modification.

Contents

Page

Introduction

This International Standard is the first of a number of standard test methods in the field of clothing comfort.

The physical properties of textile materials which contribute to physiological comfort involve a complex combination of heat and mass transfer. Each may occur separately or simultaneously. They are time-dependent, and may be considered in steady-state or transient conditions.

Thermal resistance is the net result of the combination of radiant, conductive and convective heat transfer, and its value depends on the contribution of each to the total heat transfer. Although it is an intrinsic property of the textile material, its measured value may change through the conditions of test due to the interaction of parameters such as radiant heat transfer with the surroundings.

Several methods exist which may be used to measure heat and moisture properties of textiles, each of which is specific to one or the other and relies on certain assumptions for its interpretation.

The sweating guarded-hotplate (often referred to as the "skin model") described in this International Standard is intended to simulate the heat and mass transfer processes which occur next to human skin. Measurements involving one or both processes may be carried out either separately or simultaneously using a variety of environmental conditions, involving combinations of temperature, relative humidity, air speed, and in the liquid or gaseous phase. Hence transport properties measured with this apparatus can be made to simulate different wear and environmental situations in both transient and steady-states. In this International Standard only steady-state conditions are selected.

Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)

1 Scope

This International Standard specifies methods for the measurement of the thermal resistance and water-vapour resistance, under steady-state conditions, of e.g. fabrics, films, coatings, foams and leather, including multilayer assemblies, for use in clothing, quilts, sleeping bags, upholstery and similar textile or textile-like products.

The application of this measurement technique is restricted to a maximum thermal resistance and water-vapour resistance which depend on the dimensions and construction of the apparatus used (e.g. 2 $m^2 \cdot K/W$ and 700 $m^2 \cdot Pa/W$ respectively, for the minimum specifications of the equipment referred to in this International Standard).

The test conditions used in this International Standard are not intended to represent specific comfort situations, and performance specifications in relation to physiological comfort are not stated.

2 Terms and definitions

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

2.1
thermal resistance
R_{ct}
temperature difference between the two faces of a material divided by the resultant heat flux per unit area in the direction of the gradient

Note 1 to entry: It is a quantity specific to textile materials or composites which determines the dry heat flux across a given area in response to a steady applied temperature gradient. The dry heat flux may consist of one or more conductive, convective and radiant components.

Note 2 to entry: Thermal resistance is expressed in square metres kelvin per watt.

2.2
water-vapour resistance
R_{et}
water-vapour pressure difference between the two faces of a material divided by the resultant evaporative heat flux per unit area in the direction of the gradient

Note 1 to entry: It is a quantity specific to textile materials or composites which determines the “latent” evaporative heat flux across a given area in response to a steady applied water-vapour pressure gradient. The evaporative heat flux may consist of both diffusive and convective components.

Note 2 to entry: Water-vapour resistance is expressed in square metres pascal per watt.

2.3
water-vapour permeability index
i_{mt}
ratio of thermal and water-vapour resistances in accordance with Formula (1):

$$i_{mt} = S \cdot \frac{R_{ct}}{R_{et}} \quad (1)$$

