SLOVENSKI STANDARD
SIST EN 16422:2025

01-junij-2025

Oblačila - Fiziološki učinki - Klasifikacija termoregulacijskih lastnosti

Clothing - Physiological effects - Classification of thermoregulatory properties

Bekleidung - Klassifizierung von thermoregulierenden Eigenschaften

Habillement - Effets physiologiques - Classification des propriétés thermorégulantes

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English Version

Clothing - Physiological effects - Classification of thermoregulatory properties

Habillement - Effets physiologiques - Classification des propriétés thermorégulantes

Bekleidung - Klassifizierung von thermoregulierenden Eigenschaften

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16422:2025) has been prepared by 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of an identical text or by endorsement, at the latest by October 2025, and conflicting national standards shall be withdrawn at the latest by October 2025.

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

This document supersedes CEN/TR 16422:2012.

EN 16422:2025 includes the following significant technical changes with respect to CEN/TR 16422:2012:

— updated normative references and move of all normative references into the Bibliography;

— informative Annex A becomes normative;

— informative Annex B has been replaced by an informative reference to EN 17534;

— informative references to manikin standards EN ISO 15831 and EN 17528 added;

— editorial changes were made throughout the document to bring it up-to-date.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document has been developed to help retailers, manufacturers, and consumers with the evaluation of thermoregulatory properties of textiles, and selection of the most appropriate methods to define their individual material performance requirements.

In order to encourage the use of the widest possible selection of materials and technologies, this document takes the form of advice and guidance on the tests or groups of tests which would verify the defined performance characteristics of a material or a product composite. It summarizes the scope and application of the test described and provides an indication of suggested range of results for the referred test methods to allow the user to grade performance of the material under evaluation. Where a choice of test methods is available for measuring the same parameter on a material, each is described to allow the user of this document to select the most appropriate method for their requirements.

This document also introduces a system of three performance levels for the different thermoregulatory properties:

— thermal insulation;

— water vapour transmission (breathability);

— air permeability;

— water penetration resistance and repellence;

— liquid sweat management.

The large differences in the conditions of use necessitate a flexible use of the properties and performance levels. This allows a choice of the appropriate level for each property and so to compose a 'product profile', adapted to each specific type of use. There is for example, a significant difference between thermoregulatory properties required for outerwear clothing for cool, windy, and rainy weather during low activity, and socks for warm indoor use during intense physical or sport activity. In addition, the work garments for a shop assistant requires different properties of thermoregulation than the underwear intended for skiing, or home wear for the elderly. The ambient temperature, ambient moisture, wind and level of activity, the contact to skin or other layers of garment(s) influence the requirements.

At the point of issue, it is recognized that the industry is in a constant state of development with regard to new technology for innovative fibres and performance applications, and that methods required to evaluate these new technologies can in the future be different to those in this document. Subsequent revisions will consider the addition of any new test methods required to keep advice current to the industry and its changing needs.

This document includes an Annex A. In this Annex A, there is consideration for product design and use situations, as material performance is not the sole contributory factor to the thermoregulatory performance of the final product or ensemble in use. This Annex A also has examples of marking products.

1 Scope

This document specifies test methods available for the measurement of thermoregulatory properties of textile materials for use in garments and gives guidance on the most suitable methods for selection where choices are available to the user.

This document also establishes classification of the thermoregulatory properties in three performance levels.

This document does not apply to garments or clothing intended to be worn by babies, infants and children whose thermoregulation within the body has not yet been fully developed.

This document does not apply to the thermoregulatory properties of personal protective equipment (PPE) and clothing items or textile products for which a standard already specifies a particular requirement.

This document does not apply also to heated textiles, phase change materials (PCM) and similar smart materials for thermoregulation, for which CEN ISO/TR 23383 can give better guidance.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

3.1
thermoregulatory property
property of textiles which influence the thermoregulation of the human body to maintain the core body temperature at a stable and comfortable state

Note 1 to entry: The properties are thermal insulation, water vapour transmission (breathability), air permeability, water penetration resistance and repellence and liquid sweat management.

3.2
thermal insulation
thermal resistance
R_{ct}
quantity specific to textile materials or composites which determines the dry heat flux between the two faces of a material related to area and temperature gradient, expressed in square metres Kelvin per watt (m^2 K/W)

Note 1 to entry: The dry heat flux consists of one or more conductive, convective, and radiant components.