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Textiles and textile products - Smart (Intelligent) textiles - Definitions, categorisation, applications and standardization needs (ISO/TR 23383:2020)

Textiles et produits textiles - Textiles intelligents - Définitions, catégorisation, applications et besoins de normalisation (ISO/TR 23383:2020)

Textilien und textile Produkte - Intelligente Textilien - Definitionen, Klassifizierung, Anwendungen und Normungsbedarf (ISO/TR 23383:2020)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (CEN ISO/TR 23383:2020) 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.

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.

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Endorsement notice

The text of ISO/TR 23383:2020 has been approved by CEN as CEN ISO/TR 23383:2020 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38, *Textiles*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Terms like "smart textile" and "intelligent textile" mean different things to different people. However, there is a common agreement that these are textiles or textile products that possess additional intrinsic and functional properties not normally associated with traditional textiles.

Although adjectives such as "smart" or "intelligent" are mainly intended for marketing purposes, more technically correct definitions will not prevent the use of this terminology by textile manufacturers or by the general public. Nor will the unintended inclusion of "non-smart" products make products any less safe or fit for purpose.

The standardization of smart textiles or smart textile products or systems is not straightforward because it involves an overlap between the standardization of the "traditional" textile product, e.g. a fire fighter's jacket, and the standardization of the additional intrinsic functional properties of the "smart product". This overlap can manifest itself in a number of areas, possibly including:

— Expertise: the knowledge and experience of standardization for the textile properties and for the additional properties (temperature sensing, variable thermal insulation properties) can come from different unrelated standardization groups. To take the above example, there should be input from standardization groups working in the areas of textiles, medical devices and electric or electronic devices.

— Testing: there is a need to test the additional functional properties to specific textile test standards and vice versa. Again, with the same example, the electronic elements should be assessed for their resistance to cleaning and the textile elements need to be tested for electrical safety.

— Unexpected and/or unintended synergies: these might result from the combination of technologies in smart textiles and need be recognized and addressed by standardization, wherever possible. For example, the presence of conductive fibres to incorporate a personal stereo into a smart raincoat might increase the risk of the wearer suffering a lightning-strike in a thunderstorm. This is despite the fact that neither rainwear nor personal stereos, when separate, need to be assessed against this risk.

— Legislation: Certain textile product groups, e.g. protective clothing, geotextiles or textile floor coverings, are in addition subject to specific national and/ or regional legislation. It can be necessary to simultaneously address the requirements of legislation covering more than one product category. For example, a "classic" fire fighter's suit needs comply with the requirements for personal protective equipment, whereas a "smart" fire fighter's suit with built-in electronic and ICT features should also comply with the applicable provisions for electronic equipment and ICT. Conformity assessment will therefore need to follow the conformity assessment schemes for all applicable legal provisions.

The purpose of this document is to identify the considerations that need to be addressed when writing standards for smart textiles or applying existing standards to them. This information can be of use to:

— end-users, in determining whether a product has indeed been fully assessed;

— conformity assessment bodies, as a guide towards assessing products according to the appropriate standards;

— specification writers, as a guide to writing new specific standards for smart textiles;

— manufacturers of smart textiles, to advise them on appropriate product testing and on suitable ways to substantiate product claims;

— market surveillance authorities, to help in the assessment of product claims, product safety and fitness for purpose.

The factual information in this document is available elsewhere in a more comprehensive form and each individual item will inevitably be common knowledge to at least one group of readers. The aim of this document is to guide readers through those areas, with which they are not familiar, and to direct them

towards further, more specialized reading. In accordance with ISO rules, this document is intended to be reviewed regularly to keep it in line with technical and market evolutions.

Textiles and textile products — Smart (Intelligent) textiles— Definitions, categorisation, applications and standardization needs

1   Scope

This document provides definitions in the field of "smart" textiles and textile products as well as a categorization of different types of smart textiles. It describes briefly the current stage of development of these products and their application potential and gives indications on preferential standardization needs.

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 terminological databases for use in standardization at the following addresses:

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

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

3.1
textile fibre
unit of matter characterised by its flexibility, fineness and high ratio of length to maximum transverse dimension, which render it suitable for textile applications

[SOURCE: Regulation EU 1007/2011, Article 3, 1. (b), (i)]

3.2
textile product
product made of *textile fibres* (3.1), yarns and/ or fabrics and intended to be used, as such or in conjunction with other textile or non-textile elements

3.3
functional textile product
textile product to which a specific function is added by means of material, composition, construction and/or finishing (applying additives, etc.)

3.4
smart textile product
intelligent textile product
interactive textile product
functional textile product (3.3) which interacts reversibly with its environment, or responds or adapts to changes in the environment

Note 1 to entry: The term "smart textile" can refer to either a "smart textile product" or a "smart textile system". Only the context, in which the term is used, determines which one of the two is intended.