INTERNATIONAL STANDARD

ISO 18782

Second edition
2023-05

Textiles — Determination of dynamic hygroscopic heat generation

Textiles — Détermination de la production de chaleur dynamique hygroscopique

Reference number
ISO 18782:2023(E)

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Published in Switzerland

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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 document 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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This document was prepared by Technical Committee ISO/TC 38, *Textiles*.

This second edition cancels and replaces the first edition (ISO 18782:2015), which has been technically revised.

The main changes are as follows:

— in Clause 3, temperature definitions have been added;

— in Clause 7, Figure 1 has been changed from one testing position to 4 testing positions;

— in 7.2.5.5, rectifying plate was introduced for more stable testing;

— in Clause 10.2, the pretreatment process has been added;

— in Annex A, the pretreatment process has been added to the testing method for the determination of air flow rate for high humidity.

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Introduction

In the apparel and clothing market, warm heat-comfort textile material is attracting consumers' attention. It offers comfortable warmth through the combined technology of the hygroscopic heat generation and heat insulation.

The phenomenon of the hygroscopic heat generation is known as a common function of natural fibres especially, but not so much for synthetic fibres. Therefore, the synthetic fibre producers have been developing fibres and textiles with an appropriate warm-feeling property.

This document provides a test method to obtain the practical heat generation of textiles under wearing conditions.

The apparatus used in this test method has multiple test positions. So, this method is practical and economical with high accuracy.

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Textiles — Determination of dynamic hygroscopic heat generation

1 Scope

This document specifies a test method for the determination of hygroscopic heat generated by flowing low to high humidity air on one side of a surface. It is applicable to all kinds of sheet-shaped textile materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 105-F02, *Textiles — Tests for colour fastness — Part F02: Specification for cotton and viscose adjacent fabrics*

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

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 https://www.electropedia.org/

3.1
generated hygroscopic heat
hygroscopic heat generated by the loss of kinetic energy when gaseous water molecules are adsorbed on a surface of textile material

3.2
temperature at low humidity
$T_{initial}$
initial equilibrium temperature at measurement side of a specimen when the low humidity air is supplied

3.3
generated hygroscopic heat temperature
ΔT
temperature difference between the initial equilibrium temperature and the temperature when the high humidity air is supplied on measurement side of a specimen

3.4
maximum temperature at high humidity
T_{max}
maximum temperature at measurement side of a specimen when high humidity air is supplied

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