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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 45365-2025

**Textiles - Determination of moisturizing effect - Measurement of
microclimate using sweating guarded hotplate**

纺织品保湿效果的测定蒸发热板测微气候法

(English Translation)

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Table of Contents

Foreword...	3
1 Scope...	5
2 Normative References...	5
3 Terms and Definitions...	5
4 Principle...	6
5 Equipment...	7
6 Test Steps...	9
7 Test Report...	10
Appendix A (normative) Evaluation of Hydration Value...	11
Appendix B (informative) Example of Test Results...	12

Foreword

This document was drafted in accordance with the rules provided in GB/T 1.1-2020 Directives

for Standardization - Part 1.Rules for the Structure and Drafting of Standardizing Documents.

This document modifies and adopts ISO 21232.2018 Textiles - Determination of Moisturizing

Effect of Textile Materials by Measurement of Microclimate between Textiles and Simulated Human Skin Using Sweating Guarded Hotplate.

In comparison with ISO 21232.2018, this document makes the following structural adjustments.

---6.2.2 corresponds to 6.3.2 of ISO 21232.2018;

---6.2.4 corresponds to 6.2.2 of ISO 21232.2018;

---6.3.2 corresponds to 6.3.3 of ISO 21232.2018;

---6.2.3 and 6.3.3 are added.

The technical differences between this document and ISO 21232.2018 and the causes for these

differences are as follows.

- The requirement that "the size of the frame shall be consistent with the size of the sweating guarded hotplate" is added (see 5.3), and meanwhile, the annotation of the frame side length in Figure 3 is deleted (see Figure 3 of ISO 21232.2018) to ensure that the frame size matches the sweating guarded hotplate;
- The normative reference GB/T 6529 is used to replace ISO 139 (see 6.1.2) to adapt to the technical conditions of China;
- The normative reference GB/T 11048-2018 is used to replace ISO 11092.2014 (see 5.1, 5.5, 6.2.3, 6.3.1, and A.3 of Appendix A) to adapt to the technical conditions of China;
- The allowable deviations of temperature, relative humidity and wind speed are added (see 6.2.2) to improve the operability of the test;
- The determination of instrument constants is added (see 6.2.3) to improve the operability of the test;
- The specimen installation requirements are added (see 6.2.4) to improve the accuracy of the test;
- The provisions on result calculation and value are added (see 6.3.3) to unify the result calculation and value requirements;
- The number of determinations of hydration value is modified (see A.3; A.3 in Appendix A of ISO 21232.2018) to improve the stability of the results.

Textiles - Determination of Moisturizing Effect -
Measurement of Microclimate Using Sweating Guarded
Hotplate

1 Scope

This document describes a test method for determining the moisturizing effect of textile materials by measuring the water-vapor resistance including air layer and relative humidity by

means of a sweating guarded hotplate under simulated microclimate conditions.

This document is applicable to all types of clothing fabrics. Films, leather and multi-layer composite materials may take this as a reference.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only

versions with a specified date are applicable to this document. In terms of references without a

specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 6529 Textiles - Standard Atmospheres for Conditioning and Testing (GB/T 6529-2008, ISO 139.2005, MOD)

GB/T 11048-2018 Textiles - Physiological Effects - Measurement of Thermal and Water-vapor

Resistance under Steady-state Conditions (sweating guarded-hotplate test) (ISO 11092.2014, MOD)

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1 water-vapor resistance

Ret

The ratio of the water vapor pressure difference on both sides of a specimen to the evaporation

heat flow per unit area passing vertically through the specimen.

NOTE 1: the evaporation heat flow may be formed by diffusion and convection.

NOTE 2: the unit of water-vapor resistance Ret is (m² - Pa/W).

[source. GB/T 11048-2018, 2.2]

3.2 microclimate

The environmental climate in a small air layer (between the skin and the fabric or between the

textile and the sweating guarded hotplate).

NOTE: this microclimate has certain temperature and humidity characteristics.

3.3 water-vapor resistance including air layer

Ret_{al}

The ratio of the water vapor pressure difference on both sides of a specimen (including a 5 mm

thick air layer) to the evaporation heat flow per unit area passing vertically through the specimen.

NOTE 1: the water-vapor resistance including air layer is determined under the simulated state that there is an air layer between the skin and the clothes.

NOTE 2: the unit of water-vapor resistance including air layer Ret_{al} is (m² - Pa/W).

3.4 hydration value

The difference in dielectric constant between water and other substances obtained by measuring

the capacitance of the dielectric.

NOTE 1: a dielectric constant tester or skin moisture tester measures the change in dielectric constant, which is caused by the change in capacitance due to the hydration of the skin surface.

NOTE 2: the dielectric constant of water is 81.

NOTE 3: hydration values are expressed as numbers from 0 ~ 130.

4 Principle

In order to simulate the microclimate, a device is designed to separate the specimen from the

hotplate, which contains a humidity sensor. The hotplate is covered with a breathable and water-

impermeable film to simulate the hydration of the skin. The moisturizing effect of the textiles is determined by measuring the water-vapor resistance including air layer (Ret_{al}) and the relative

humidity between the sweating guarded hotplate and the specimen.

NOTE: the wearing comfort of clothing usually depends on the microclimate environmental