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

GB/T 38302-2025

Replacing GB/T 23467-2009, GB/T 38302-2019

**Protective clothing - Thermal protective performance test
method and flash fire protective performance manikin test
method**

防护服装 热防护和假人火焰轰燃防护性能测试方法
(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document supersedes GB/T 38302-2019 "Test Methods for Thermal Protection Performance of Protective Clothing" and GB/T 23467-2009 "Evaluation Using Dummies" "Test Method for Flame Retardant Properties of Clothing under Flashover Conditions". This document is based on GB/T 38302-2019 and integrates GB/T 23467-2009.

Compared with GB/T 38302-2019, the main technical changes, apart from structural adjustments and editorial modifications, are as follows.

---Added heat transfer response curves, burn data, absorbed energy, relevant surface area, data acquisition time, data computation time, energy, and exposure data.

Heat flux, heat flux, absorbed heat flux, incident heat flux, incident energy, total incident energy, bare burning, maximum absorbed heat flux, heat transfer Energy, total transferred energy, dummy thermal protection factor, flame distribution, instrumented dummy, thermal sensor, copper calorimeter, dummy heat Sensors, standard heat flow meters, thermal protection, estimated total burn area, first-degree burns, first-degree burn area, second-degree burns, second-degree burns Terminology and definitions for area, third-degree burn, area of third-degree burn, ohm value, and predicted duration of pain (see 3.1, 3.11-3.43);

---The angle between the centerline of the burner and the horizontal direction has been changed (see 4.3.4.1, 6.4.1 in the 2019 version);

---Added traceability calibration for standard radiative heat flow meters (see 4.5.1.1.1);

---Added verification and calibration of the copper calorimeter sensor (see 4.5.1.3);

---Added requirements for drying and calibration of repaired copper calorimeter sensors (see 4.5.2.2, 4.5.2.3);

---Changed the cumulative thermal exposure during any exposure period, the cumulative thermal energy of the sensor, and the copper calorimeter incident heat flux at any time interval.

Calculation formulas (see 4.7.2.2.2, 4.7.2.2.3, 4.7.2.2.4, and 10.2.2.2, 10.2.2.3, and 10.2.2.4 in the 2019 version);

---Added "Test Method for Evaluating the Protective Performance of Clothing under Flame Flashover Conditions Using Dummy Mannequins" (see Chapter 5);

---Added "Requirements for skin burn prediction calculations and test cases in dummy flashover tests (see Appendix G)";

---Added calibration and verification methods for dummy sensors (see Appendix H).

This document is modified to adopt ISO 13506-1:2024 "Flame and heat protective clothing - Part 1: Test methods for complete protective clothing using instruments".

"Energy Transfer Tested Using Artificialized Dummies" and ISO 13506-2:2024 "Flame and Heat Protective Clothing - Part 2: Calculation of Predictive Effects on Skin Burns" Summation test cases.

Compared with ISO 13506-1:2024 and ISO 13506-2:2024, this document has undergone significant structural adjustments, and the organizational structure between documents has

also been improved.

See Appendix A for a list of changes in the numbering system.

This document differs significantly from ISO 13506-1:2024 and ISO 13506-2:2024 in several technical aspects, and further details are provided in the relevant clauses.

The blank spaces in the side margins are marked with a vertical single line (|). A summary of these technical differences and their reasons can be found in Appendix B.

The following editorial changes have been made to this document.

---To align with existing standards, the standard title has been changed to "Test Method for Thermal Protection Performance of Protective Clothing and Flame Flashover Protection of Dummies";

---The descriptions from the ISO and IEC terminology databases have been removed from the terms and definitions;

---Added informative Appendix J, "Obtaining Good Exposure Heat Flux and Fire Scene Through Burner Position Adjustment in Dummy Flashover Tests" distributed".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Emergency Management of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee on Standardization of Personal Protective Equipment (SAC/TC112).

1 Scope

This document describes the testing methods (including thermal protection performance values and thermal protection performance evaluation) for the thermal protection performance of protective clothing materials, and the use of dummies.

Test methods for evaluating the flame retardant properties of clothing under flashover conditions.

In this document, the Thermal Protection Performance Value (TPP) and Thermal Protection Performance Assessment (TPE) tests are applicable to the thermal protection of single-layer or multi-layer materials.

It can be used to test and evaluate thermal protective materials for workers exposed to convective and radiative heat hazards; and to evaluate clothing under flashover conditions using dummies.

The test method for flame retardant properties is applicable to the testing and evaluation of

the flame retardant properties of finished protective clothing.

This document does not apply to the testing of non-flame-retardant materials and clothing that are prone to melting or dripping at high temperatures.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

GB/T 3291.1 Textiles - Properties and testing terminology of textile materials - Part 1: Fibers and yarns
GB/T 3291.2 Textiles - Properties and Test Terminology of Textile Materials - Part 2: Fabrics
GB/T 3291.3 Textiles - Properties and Test Terminology of Textile Materials - Part 3: General
GB/T 6529 Standard Atmosphere for Conditioning and Testing of Textiles
GB/T 8629 Home washing and drying procedures for testing textiles
GB/T 12903 Terminology for Personal Protective Equipment
JJF1572-2016 Calibration Specification for Radiation Calorimeters

3 Terms and Definitions

The terms and definitions defined in GB/T 3291.1, GB/T 3291.2, GB/T 3291.3 and GB/T 12903, as well as the following terms and definitions, apply to this standard.

document.

It describes the trajectory of data points that describe the temperature change of a material over time under the action of a specific heat source.

Note: This curve reflects the material's response characteristics to heat transfer.

During the testing of thermal protection materials, the intersection of the material's heat transfer response curve and the Stol curve over cumulative time is used to determine...

Determined cumulative energy.

Note 1: The unit is kilowatt-seconds per square meter (kW·s/m²) or calories per square centimeter (cal/cm²).

Note 2: Stol is a personal name.

During the testing of thermal protection materials, the tangency of the material's heat transfer response curve over a certain time period with the Stol curve was measured.