

# JIS

JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

---

JIS T 8024 : 2020

(JSAA/JSA)

**Clothing for protection against heat and  
flame — Determination of heat  
transmission on exposure to both flame  
and radiant heat**

---

ICS 13.340.10

Reference number : JIS T 8024 : 2020 (E)

PROTECTED BY COPYRIGHT

22 S

T 8024 : 2020

Date of Establishment: 2009-07-25

Date of Revision: 2020-03-25

Date of Public Notice in Official Gazette: 2020-03-25

Investigated by: Japanese Industrial Standards Committee  
Standards Board for ISO area  
Technical Committee on Safety

---

JIS T 8024 : 2020, First English edition published in 2020-12

Translated and published by: Japanese Standards Association  
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

---

In the event of any doubts arising as to the contents,  
the original JIS is to be the final authority.

© JSA 2020

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

AH/AT

PROTECTED BY COPYRIGHT

## Contents

	Page
Introduction .....	1
1 Scope .....	2
2 Normative references .....	3
3 Terms and definitions .....	4
4 Principle .....	7
5 Apparatus .....	8
5.1 General .....	8
5.2 Heat source .....	9
5.3 Specimen holder assembly .....	9
5.4 Protective shutter .....	9
5.5 Specimen mounting plate .....	10
5.6 Specimen holding plate .....	10
5.7 Spacer .....	10
5.8 Sensor assembly .....	11
5.9 Data acquisition/analysis/equipment control system .....	12
5.10 Gas supply .....	12
5.11 Gas rotameter .....	13
5.12 Heat flux transducer .....	13
5.13 Solvent .....	13
6 Precautions .....	13
7 Sampling .....	13
7.1 Specimen dimensions .....	13
7.2 Number of specimens .....	14
8 Conditioning and testing atmospheres .....	14
8.1 Conditioning atmosphere .....	14
8.2 Testing atmosphere .....	14
9 Test procedure .....	14
9.1 Initial set up and calibration procedures .....	14
9.2 Sensor care .....	15
9.3 Specimen holder care .....	16
9.4 Computer processing of data .....	16
9.5 Test specimen mounting .....	16
9.6 Test specimen exposure when both TPI and HTI(DE) <sub>x</sub> are measured .....	17
9.7 Test specimen exposure when only HTI(DE) <sub>x</sub> is measured .....	17
10 Expression of results .....	18

10.1	Selection of analysis method	18
10.2	Thermal protection index (TPI) analysis method	18
10.3	Heat-transfer index-thermal analysis method	18
10.4	Response to convective and radiant heat exposure	19
11	Test report	19
Annex A (informative)	Information on availability of test equipment components	21
Annex B (informative)	Basis of sensor calibration	24
Annex C (informative)	Interlaboratory test data	25
Annex JA (informative)	Comparison table between JIS and corresponding International Standard	27

## Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry and the Minister of Health, Labour and Welfare through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Safety Appliances Association (JSAA)/ Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act. This edition replaces the previous edition (**JIS T 8024: 2009**), which has been technically revised.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Ministers and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, published patent application or utility model rights.

Blank

# Clothing for protection against heat and flame — Determination of heat transmission on exposure to both flame and radiant heat

## Introduction

This Japanese Industrial Standard has been prepared based on **ISO 17492** : 2019, Edition 2, with some modifications of the technical contents in consideration of convenience in usage.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

The measurement of the thermal energy transferred from the exterior of a material to the interior can be a significant factor in determining the level of protection or insulation provided by an assembly. While full-scale test methods are a better means of determining how an assembly performs, small scale tests such as those described in **JIS T 8020** and **JIS T 8021** can be used in establishing benchmarks of performance for the materials from which these assemblies are made. These tests specified in **JISs** enable the user of a material to anticipate how the properties of a particular material could affect the performance of the assembly when exposed to a high heat flux.

The purpose of an assembly for thermal protection is to prevent or reduce the potential for skin burn injury to the wearer. The performance of a product can be determined by comparing the total exposure energy to that which is transferred through the protective material to a known point where the thermal exposure would produce a burn injury in human tissue. The total exposure energy required to cause the onset of a second-degree burn in human tissue is identified as the thermal-protective index (TPI). In the TPI analysis of the data, the specimen is exposed to steady heat until the energy transferred through the specimen is equivalent to the energy that would cause the onset of a second-degree burn injury (e.g. a blister).

Other uses include comparison of the insulation from a high-temperature exposure in terms other than the TPI analysis of human tissue. For these uses, an alternate method of evaluating the heat transfer is provided. The total energy transferred that causes a temperature rise of the copper sensor by 12 °C and 24 °C is determined as the heat-transfer index-thermal (HTI-T<sub>x</sub>). In the HTI-T<sub>x</sub> analysis of the data, the specimen is exposed to heat until a specified amount of energy is transferred. This is a measure of the insulation performance and thermal capacity of the specimen.

Unlike what is specified in **JIS T 8020** and **JIS T 8021**, the heat source in this test method is adjusted so that the radiant heat becomes equivalent to the convective heat wherever possible, and this equalized radiant/convective output is set to a thermal en-