भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDRADS

Draft For Comments Only

(*Not to be reproduced without permission of BIS or used as Standard*)

भारतीय मानक मसौदा

वस्त्रादि – सुरक्षा वस्त्र
भाग 2 विकरण ऊष्मा के स्त्रोत के संपर्क पर वस्त्रादि एवं वस्त्रादि सामिग्री का आंकलन
(आई एस 15758 (Part 2) *का पहेला पुनरीक्षण)*

Draft Indian Standard

Textiles — Protective Clothing
Part 2 Evaluation of Materials and Material Assemblies when Exposed to a Source of Radiant Heat
[First Revision of IS 15758 (Part 2)*]*

ICS : 13.340.10

Textiles Protective Clothing Sectional Committee, TXD 32	Last date for receipt of comments is 03 September 2025

NATIONAL FOREWORD
(*Formal clauses will be added later*)

This Indian Standard intended to be adopted is identical with ISO 6942 : 2022 'Protective clothing — Protection against heat and fire — Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat' issued by the International Organization for Standardization (ISO).

This standard was originally published in 2007. The present revision has been undertaken to align it with the latest version of ISO 6942 : 2022.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

The technical committee has reviewed the provisions of the following International Standard referred in this standard intended to be adopted and has decided that these are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO/TR 11610	Protective clothing — Vocabulary

In this standard intended to be adopted, reference appears to certain International Standards where the standard atmospheric conditions to be observed are stipulated which are not applicable to tropical/subtropical countries. The applicable standard atmospheric conditions for Indian conditions are 27 ± 2 °C and 65 ± 5 percent relative humidity and shall be observed while using this standard.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.

Extract of ISO 6942 : 2022 'Protective clothing — Protection against heat and fire — Method of test: Evaluation of materials and material assemblies when exposed to a source of radiant heat'

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 94, *Personal safety — Personal protective equipment*, Subcommittee SC 13, *Protective clothing*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 6942:2002), which has been technically revised.

The main changes are as follows:

— normative references have been updated (see Clause 2);
— the specified relative humidity range for the conditioning atmosphere has been changed (see 7.1);
— an example product for the optically black paint has been provided (see 5.4);
— the annex on ILT has been revised (Annex A).

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

Protective clothing against radiant heat is worn at different occasions and accordingly the radiation intensity (characterised by the heat flux density) acting on the clothing material extends over a wide range. This document describes two test methods which can be applied to all sorts of materials, but, according to the intended use of the material, the heat flux density has to be chosen properly and the results have to be interpreted correctly,

Industrial workers or fire fighters may be exposed to a relatively low radiation intensity over a long period of time. On the other hand, industrial workers or fire fighters may be exposed to medium radiation intensities for relatively short periods of time or to high radiation intensities for very short periods of time. In the latter case, the clothing material may be changed or even destroyed.

The materials for protective clothing are usually tested at medium and high heat flux densities. The response of materials to method A and the times t_{12} and t_{24} and transmission factor measured with method B characterise the material. For information on the precision of method B, see Annex A.

1 Scope

This document specifies two complementary methods (method A and method B) for determining the behaviour of materials for heat protective clothing subjected to heat radiation.
These tests are carried out on representative single or multi-layer textiles or other materials intended for clothing for protection against heat. They are also applicable to assemblies, which correspond to the overall build up of a heat protective clothing assembly with or without underclothing,
Method A serves for visual assessment of any changes in the material after the action of heat radiation. With method B the protective effect of the materials is determined. The materials may be tested either by both methods or only by one of them.
The tests according to these two methods serve to classify materials; however, to be able to make a statement or prediction as to the suitability of a material for protective clothing additional criteria must be taken into account.
Since the tests are carried out at room temperature the results do not necessarily correspond to the behaviour of the materials at higher ambient temperatures and therefore are only to a limited extent suitable for predicting the performance of the protective clothing made from the materials under test.

2 Normative reference

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/TR 11610, Protective clothing — Vocabulary

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 11610 and the following apply.
ISO and IEC maintain terminology 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
Heat transfer levels

3.1.1
time t_{12}
time in seconds expressed to one decimal place, to achieve a calorimeter temperature rise of (12 ± 0,1) °C when tested according to method B

3.1.2
time t_{24}
time in seconds expressed to one decimal place, to achieve a calorimeter temperature rise of (24 ± 0,2) °C when tested according to method B

3.2
heat transmission factor
TF
measure of the fraction of heat transmitted through a specimen exposed to a source of radiant heat. It is numerically equal to the ratio of the transmitted to the incident heat flux density

3.3
test specimen
all layers of fabric or other material arranged in the order and orientation as used in practice and including undergarments if appropriate

3.4
incident heat flux density
amount of energy incident per unit time on the exposed face of the calorimeter
Note 1 to entry: The incident heat flux density is expressed in kW/m^2.

3.5
radiant heat transfer index
RHTI
number, calculated from the mean time (measured in seconds, to one decimal place) to achieve a specified temperature rise in the calorimeter when testing by this method with a specified *incident heat flux density* (3.4)

3.6
change in appearance of the specimen
all changes in appearance of the material (shrinkage, formation of char, discoloration, scorching, glowing melting, etc.).

3.7
multi-layer clothing assembly
series of layers in garments arranged in the order as worn
Note 1 to entry: It may contain multi-layer materials, material combinations or separate layers of clothing material in single layers.

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should include

reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

Please e-mail your comments to txd@bis.gov.in

NAME OF THE COMMENTATOR/ORGANIZATION:

DOCUMENT NO: TXD 32 (28463) WC

BIS LETTER REFERENCE NO. : TXD 32 (28463)

Item, Clause Sub-Clause No. Commented upon (Use Separate Box afresh)	**Comments**	**Specific Proposal (Draft clause to be add/amended)**	**Remarks**	**Technical References and justification on which (2), (3), (4) are based**
(1)	**(2)**	**(3)**	**(4)**	**(5)**