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Protective clothing — Protection against flame — Method of test for limited flame spread

Vêtements de protection — Protection contre les flammes — Méthode d'essai pour la propagation de flamme limitée

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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 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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 13, *Protective clothing*.

This second edition cancels and replaces the first edition (ISO 15025:2000), of which all clauses, several figures and Annex C have been technically revised. A new Clause 8 on sampling and sample preparation has been added. A new Annex D on precision has been added.

To improve precision, the following major modifications have been made from the first edition:

a) the width of the specimen for Procedure B has been changed from 160 mm to 80 mm;

b) the gas used has been limited to commercial grade propane;

c) definitions of several reported observations have been added or revised;

d) more detailed instructions for preparing hemmed specimens, multilayer specimens and seamed specimens have been added.

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Introduction

The first edition of this document was initially prepared by ISO/TC 38/SC 19 as part of the revision of ISO 6940 and ISO 6941. This specific work item was transferred to Technical Committee ISO/TC 94/SC 13 in April 1997.

This method of test is closely related to the method of test specified in ISO 6941. It uses the same basic equipment but narrower specimen holders and templates for one procedure. Materials which do not burn to the upper or vertical edges of the test specimen used in this test may be classified as producing limited flame spread.

This method assesses the properties of textile fabrics in response to a short contact with a small igniting flame under controlled conditions.

The influence of seams on the behaviour of fabrics can be determined by this method, the seam being positioned within the test specimen so as to be subjected to the test flame.

Whenever practicable, trimmings should be tested as part of the fabric assembly on which they are or will be used.

A list of standards related to this document is given in the Bibliography.

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Protective clothing — Protection against flame — Method of test for limited flame spread

1 Scope

This document specifies two procedures (surface ignition and bottom-edge ignition) for determining flame spread properties of vertically oriented flexible materials in the form of single or multicomponent fabrics (coated, quilted, multilayered, sandwich constructions and similar combinations), when subjected to a small defined flame. This test standard does not apply to situations where there is restricted air supply or exposure to large sources of intense heat, for which other test methods are more appropriate.

This test method is not appropriate for materials that demonstrate extensive melting or shrinkage.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TR 11610 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
afterflame time
duration of flaming after removal of ignition source

Note 1 to entry: It is also defined as the length of time for which a *material* continues to flame under the specified test conditions, after the ignition source has been removed

Note 2 to entry: Afterflame time is measured and reported to the nearest second.

3.2
afterglow
persistence of glowing combustion of a *material* (3.10) under specified test conditions, after cessation of afterflaming or, if no afterflaming occurs, after removal of the ignition source

Note 1 to entry: Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion should not be recorded as afterglow.

3.3
afterglow time
duration of *afterglow* (3.2)

Note 1 to entry: It is also defined as the time for which a glowing combustion continues, under specified test conditions after cessation of afterflaming or, if no afterflaming occurs, after removal of the ignition source

Note 2 to entry: Afterglow time is measured and reported to the nearest second.

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3.4
char
formation of a carbonaceous brittle residue when *material* (3.10) is exposed to thermal energy

3.5
damaged length
length of the break in the tested *material* (3.10) after folding it lengthwise and creasing by hand along a line through the highest peak of the charred areas and subsequent tearing

3.6
debris
material (3.10) separating from the specimen during the test procedure and falling from the specimen without flaming

3.7
flame application time
time for which the ignition flame is applied to the test specimen

3.8
flaming debris
material (3.10) separating from the specimen during the test procedure and igniting the filter paper

3.9
hole
opening, break or discontinuity of any size not present in the original structure of the test specimen's fabric but caused by application of the test flame

Note 1 to entry: This document describes the reporting of holes in any separable layer of a multilayer specimen obtained during surface ignition testing [see 9.2.1.3 g) and Clause 10 i) 7)].

3.10
material
substances, excluding hardware, of which an item of clothing is made

3.11
multilayer assembly
combination of two or more fabrics as separate layers

EXAMPLE An outer shell, interlining and lining together form a multilayer assembly.

Note 1 to entry: A single multilayer material, such as a quilted, bonded or laminated fabric, does not constitute such an assembly.

3.12
multilayer material
material (3.10) consisting of different fabric layers intimately combined prior to the garment manufacturing stage, e.g., by weaving, quilting, coating or gluing

4 Principle

A defined flame from a specified burner is applied for 10 s to the surface or the bottom edge of textile specimens which are vertically oriented.

Information is recorded on melting, the spread of flame and afterglow and on the formation of debris, flaming debris or a hole. Afterflame time and afterglow time are recorded. Recording of damaged length is optional in the edge ignition procedure.

Surface exposure tests may be performed on both sides of multilayer fabric assemblies and in the case of a single layer fabric with different properties on each side.

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