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Protective clothing - Protection against chemicals - Measurement of cumulative permeation of chemicals with low vapour pressure through materials (ISO 19918:2017)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/18

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NORME EUROPÉENNE

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EN ISO 19918

November 2017

ICS 13.340.10

English Version

Protective clothing - Protection against chemicals - Measurement of cumulative permeation of chemicals with low vapour pressure through materials (ISO 19918:2017)

Habillement de protection - Protection contre les produits chimiques - Mesure de la perméation cumulée à travers des matériaux des produits chimiques ayant une faible pression de vapeur (ISO 19918:2017)

Schutzkleidung - Schutz gegen Chemikalien - Messung der kumulativen Permeation von Chemikalien mit niedrigem Dampfdruck durch Materialien (ISO 19918:2017)

This European Standard was approved by CEN on 15 September 2017.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN ISO 19918:2017 (E)

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European foreword

This document (EN ISO 19918:2017) has been prepared by Technical Committee ISO/TC 94 “Personal safety - Protective clothing and equipment” in collaboration with Technical Committee CEN/TC 162 “Protective clothing including hand and arm protection and lifejackets” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 19918:2017 has been approved by CEN as EN ISO 19918:2017 without any modification.

Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of EU Directive 89/686/EEC aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/031 to provide one voluntary means of conforming to essential requirements of Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment [1989 L399].

Once this document is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this International Standard and Annex II of the Directive 89/686/EEC Personal Protective Equipment

Essential Requirements of Directive 89/686/EEC	Clause(s)/subclause(s) of this International Standard	Remarks/Notes
3.10.2, Protection against cutaneous and ocular contact	Complete Standard	Together with the requirements in the product standard

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

INTERNATIONAL STANDARD

ISO 19918

First edition
2017-09

Protective clothing — Protection against chemicals — Measurement of cumulative permeation of chemicals with low vapour pressure through materials

Habillement de protection — Protection contre les produits chimiques — Mesure de la perméation cumulée à travers des matériaux des produits chimiques ayant une faible pression de vapeur

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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 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 13, *Protective clothing*.

Introduction

When assessing the performance of personal protective equipment (PPE) against chemical risks, it is clearly important to determine the ability of PPE materials to resist chemical ingress. The term "ingress" is used here specifically so as not to distinguish between penetration and permeation. Penetration is ingress through physical holes in the fabric such as pores, stitch-holes, and gaps in a protective coating. Penetration is usually quite a rapid process, leading to the ingress of chemical within a matter of minutes, whereas permeation is usually a slower process with molecular diffusion through a polymer or elastomer. However, from the perspective of the wearer of PPE (gloves, footwear, protective clothing) the mechanism of ingress is far less relevant than the fact that a quantity of chemical may at some point migrate through the fabric of the personal protective equipment.

Standards to measure permeation are designed to measure the performance of materials that include a polymer or elastomer as the movement in these materials is at the molecular level. However, although they are intended to measure movement of chemicals at a molecular level, it may be difficult to differentiate between penetration and permeation in materials with small pores, pinholes, and gaps in coating.

A number of standards, including ISO 6529, EN 16523-1 and ASTM F739, measure permeation of chemicals that are volatile and/or soluble in water or other liquid or gaseous collection media. In the above-mentioned standards, volatility or solubility in water or other liquid that does not interact with the material allows use of gaseous or liquid collection medium. However, based on the scopes of ISO 6529, EN 16523-1 and ASTM F739, these standards are not well-suited for quantifying the ingress of chemicals and mixtures that are involatile and/or insoluble in water and other liquids that do not interact with the material being tested. This document complements the above-mentioned standards as it is suitable for measuring chemicals that cannot be measured by other standards and vice versa.

This document is intended to be used to evaluate the barrier effectiveness materials used in personal protective equipment against permeation by solid and liquid chemicals with low vapour pressure and/or low solubility in commonly used liquid and gaseous collection media. This test method is not suitable for measurement of volatile chemicals that may evaporate before the chemical analysis is complete.

INTERNATIONAL STANDARD **ISO 19918:2017(E)**

Protective clothing — Protection against chemicals — Measurement of cumulative permeation of chemicals with low vapour pressure through materials

1 Scope

This document describes laboratory test methods to determine the resistance of materials, closures, and seams used in personal protective equipment (PPE) to permeation by solid or liquid chemicals with low vapour pressure (less than 133,322 Pa at 25 °C) and/or insolubility in water or other liquids commonly used as collection media. These chemicals that are often part of pesticide formulations and other mixtures cannot be measured using other standards for measuring permeation. This test method is suitable for field strength and concentrated pesticide formulations as well as other mixtures in which the active ingredient is a chemical with low vapour pressure and/or low solubility in commonly used liquid and gaseous collection media.

This test method is not intended to be used in place of standards such as ISO 6529, EN 16523-1 and ASTM F739, which measure permeation of chemicals that are either volatile or soluble in water or other liquids that do not interact with the material being tested. This document is not suitable for measurement of volatile chemicals that may evaporate before the chemical analysis is complete.

The degree of contamination depends on numerous factors, such as type of exposure, application technique, and chemical formulation. As the level of exposure can vary considerably, this method is designed to rate relative performance of PPE materials for different durations.

This method is designed to measure cumulative permeation. Breakthrough time cannot be measured by this method. This test method does not measure resistance to penetration or degradation.

The test method standard may be used for the evaluation of PPE materials that are new or those for which the product standard requires treatment, such as laundering or simulated abrasion. Details of the treatment shall be reported.

2 Normative references

No normative references are required for this document.

