SLOVENSKI STANDARD
oSIST prEN ISO 6529 :2011

01-oktober-2011

Varovalna obleka - Zaščita pred kemikalijami - Ugotavljanje odpornosti materialov za varovalne obleke proti prepustnosti tekočin in plinov

Protective clothing -- Protection against chemicals -- Determination of resistance of protective clothing materials to permeation by liquids and gases

Schutzkleidung - Schutz gegen Chemikalien - Bestimmung des Widerstands von Schutzkleidungsmaterialien gegen die Permeation von Flüssigkeiten und Gasen

Vêtements de protection - Protection contre les produits chimiques - Détermination de la résistance des matériaux utilisés pour la confection des vêtements de protection à la perméation par des liquides et des gaz

Ta slovenski standard je istoveten z: **prEN ISO 6529 rev**

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13.340.10	Varovalna obleka	Protective clothing

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EUROPEAN STANDARD

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Will supersede EN ISO 6529:2001

English Version

Protective clothing - Protection against chemicals - Determination of resistance of protective clothing materials to permeation by liquids and gases (ISO/DIS 6529:2011)

Vêtements de protection - Protection contre les produits chimiques - Détermination de la résistance des matériaux utilisés pour la confection des vêtements de protection à la perméation par des liquides et des gaz (ISO/DIS 6529:2011)

Schutzkleidung - Schutz gegen Chemikalien - Bestimmung des Widerstands von Schutzkleidungsmaterialien gegen die Permeation von Flüssigkeiten und Gasen (ISO/DIS 6529:2011)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 162.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN ISO 6529:2011) 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 document is currently submitted to the parallel Enquiry.

This document will supersede EN ISO 6529:2001.

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.

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

Endorsement notice

The text of ISO/DIS 6529:2011 has been approved by CEN as a prEN ISO 6529:2011 without any modification.

DRAFT INTERNATIONAL STANDARD ISO/DIS 6529

ISO/TC **94**/SC **13** Secretariat: **SNV**

Voting begins on **2011-07-14** Voting terminates on **2011-12-14**

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Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases

Vêtements de protection — Protection contre les produits chimiques — Détermination de la résistance des matériaux utilisés pour la confection des vêtements de protection à la perméation par des liquides et des gaz

[Revision of second edition (ISO 6529:2001)]

ICS 13.340.10

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6529 was prepared by Technical Committee ISO/TC 94, *Personal safety - Protective clothing and equipment*, Subcommittee SC 13 and by Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets* in collaboration.

This third edition cancels and replaces the second edition (EN ISO 6529:2001), which has been technically revised.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, to support Essential Requirements of EU Directive 89/686/EEC

For relationship with the EU directive, see informative Annex ZA which is an integral part of this document.

Introduction

Workers involved in the production, use, transportation, and emergency response with liquid and gaseous chemicals can be exposed to numerous compounds capable of causing harm upon contact with the human body. The deleterious effects of these chemicals can range from acute trauma such as skin irritation and burn to chronic degenerative disease, such as cancer. Since engineering controls may not eliminate all possible exposures, attention is often placed on reducing the potential for direct skin contact through the use of protective clothing that resists permeation, penetration and degradation.

The test methods described in this standard are intended to be used to evaluate the barrier effectiveness of materials used for protective clothing (see Note) against ingress by liquid or gaseous chemicals. Options are provided for conducting this testing under both conditions of continuous or intermittent contact with the chemicals.

These test methods provide various options for reporting test results in terms of breakthrough time, permeation rate and cumulative permeation to allow a comparison of protective clothing material permeation resistance. These parameters are key measures of the effectiveness of a clothing material to act as a barrier to the test chemical. Such information is used in the comparison of clothing materials during the process of selecting clothing for protection from hazardous chemicals. Long breakthrough times, low permeation rates and low cumulative permeation mass are characteristic of high level barrier materials.

Resistance to penetration by liquid chemicals should be determined by using ISO 6530 while resistance to penetration by liquid chemicals under pressure should be determined by using ISO 13994. These International Standards are listed in the Bibliography.

It has been assumed in the drafting of this International Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people with a sound understanding of analytical chemistry. Appropriate precautions should be taken when carrying out this type of testing in order to avoid injury to health and contamination of the environment.

NOTE Finished items of protective clothing include gloves, arm shields, aprons, suits, hoods, boots, etc. The phrase “specimens from finished items” encompasses seamed and other discontinuous regions as well as the usual continuous regions of protective clothing items.

Protective clothing — Protection against chemicals — Determination of resistance of protective clothing materials to permeation by liquids and gases

1 Scope

This International Standard describes laboratory test methods to determine the resistance of materials used in protective clothing to permeation by liquid or gaseous chemicals under the conditions of either continuous or intermittent contact.

Method A is applicable to the testing of liquid chemicals, either volatile or soluble in water, expected to be in continuous contact with the protective clothing material.

Method B is applicable to the testing of gaseous chemicals expected to be in continuous contact with the protective clothing material.

Method C is applicable to the testing of liquid chemicals, either volatile or soluble in water, expected to be in intermittent contact with the protective clothing material.

These test methods are only suitable for the testing of air-impermeable protective clothing materials (see Note 1). They assess the permeation resistance of the protective clothing material under laboratory conditions in terms of breakthrough time, permeation rate, and cumulative permeation. These test methods also enable observations to be made of the effects of the test liquid on the protective clothing material under test.

NOTE 1 In many cases the manufacturer of the protective clothing material will be able to advise whether their product is air-impermeable. If this information is not available the procedure in Annex E may be used to evaluate air-impermeability.

These test methods are only suitable for measuring permeation by liquids and gases. Permeation by solid challenge chemicals is beyond the scope of this standard.

NOTE 2 It can be difficult or impossible to normalize the results of permeation tests carried out against solid challenge chemicals. The normalised rate of permeation is dependent on the area of fabric exposed to the challenge chemical. In the case of solids this will, in turn, depend on factors such as particle size, size distribution, particle shape and packing considerations

These test methods address only the performance of materials or certain material constructions (e.g. seams) used in protective clothing. These test methods do not address the design, overall construction and components, or interfaces of garments or other factors which may affect the overall protection offered by the protective clothing.

It is emphasized that these tests do not necessarily simulate conditions to which clothing materials are likely to be exposed in practice. In most cases the conditions of the permeation test will be far more challenging than expected workplace conditions. The use of test data should therefore be restricted to broad comparative assessment of such material according to their permeation-resistance characteristics.

2 Normative references (Note to editor – none of the references to other standards are normative)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1
analytical technique
method of quantifying the amount of permeated chemical in the collection medium

NOTE Such methods are often specific to individual chemical and collection-medium combinations.

EXAMPLES Applicable analytical techniques can include ultraviolet (UV) and infrared (IR) spectrophotometry, mass spectrometry, pH measurement, ion chromatography, conductimetry, colorimetry, atmospheric analytical detector tubes and radionuclide tagging/detection counting. Although gas- and liquid-chromatography are separation techniques rather than detection methods they can be used in conjunction with suitable detectors to quantify the amount of permeated chemical in the collection medium.

3.2
breakthrough detection time
elapsed time measured from the start of the test to the sampling time that immediately precedes the sampling time at which the test chemical is first detected

See Figure 1.

NOTE The breakthrough detection time is dependent on the sensitivity of the method and the frequency of sampling (the interval between sampling times).

3.3
closed-loop
refers to a testing mode in which the collection medium volume is fixed and continuously circulated or recycled

NOTE 1 The collection medium volume may change slightly from sampling without replacement of the sampled collection medium.

NOTE 2 The closed-loop collection medium need not necessarily be completely physically enclosed. For example, liquid collection media may be open to the air in an expansion vessel or constant-pressure header vessel.

3.4
collection medium
liquid or gas on the inner “clean” side of the test sample in which any permeated chemical is collected.

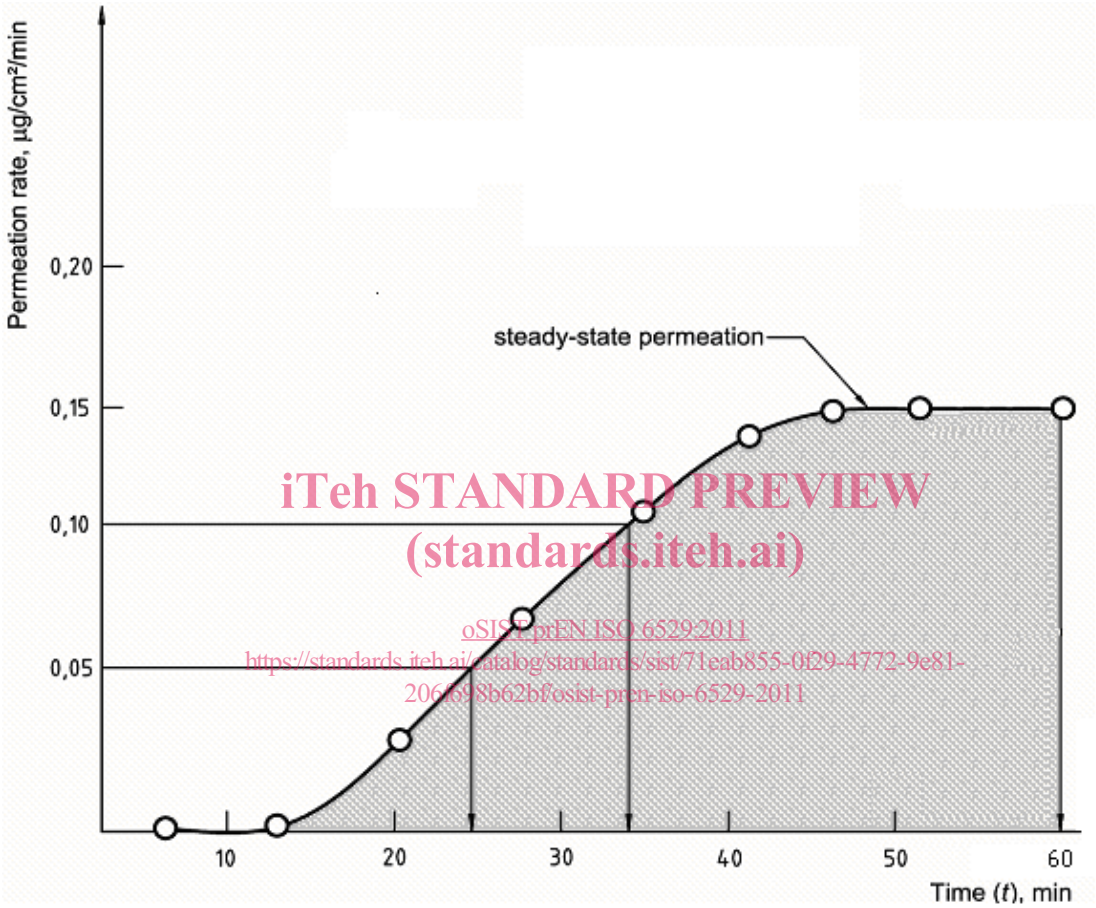
3.5
contact time
in an intermittent contact (Method C) test, the duration that the challenge-side chamber of the permeation cell contains test chemical during each cycle

3.6
cumulative permeation mass
total amount of chemical that permeates during a specified time from the start of the test

NOTE 1 Quantification of cumulative permeation enables the comparison of permeation behaviour under intermittent contact conditions with analogous data for tests carried out under continuous-contact conditions.

NOTE 2 The measurement of cumulative permeation may depend on the sensitivity of the permeation-test system.

3.7
cycle time
in an intermittent contact (Method C) test, the interval of time from the start of one contact period to the start of the next contact period



NOTE 1 The breakthrough detection time for a method sensitivity of 0,05 µg/cm2/min is 23 min but would be reported at 20 min, which corresponds to the last sampling time preceding the test. The normalized breakthrough detection time at a normalization permeation rate of 0,1 µg/cm2/min is 33 min, but similarly would be reported at 28 min, which corresponds to the preceding sampling time. The steady-state permeation rate is approximately 0,15 µg/cm2/min.

NOTE 2 The cumulative permeated mass over a 60 minute period is equal to the area of the shaded region under the graph

Figure 1 — Schematic permeation graph showing actual and normalized breakthrough times and cumulative permeation mass

3.8
degradation
deleterious change in one or more physical properties of a protective clothing material

NOTE Deleterious changes can be manifest as either an increase or decrease in a physical property. For example if the protective clothing material has been embrittled an increase in puncture resistance may be observed