SLOVENSKI STANDARD

SIST EN 14605:2005

julij 2005

Varovalna obleka pred učinki tekočih kemikalij - Zahtevane lastnosti za obleko, neprepustno za vodo (tip 3), ali z zatesnjenimi spoji (tip 4), vključno z dodatki, ki zagotavljajo zaščito za posamezne dele telesa (tipa PB [3] in PB [4])

Protective clothing against liquid chemicals - Performance requirements for clothing with liquid-tight (Type 3) or spray-tight (Type 4) connections, including items providing protection to parts of the body only (Types PB [3] and PB [4])

ICS 13.340.10

Referenčna številka
SIST EN 14605:2005(en)

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14605

March 2005

ICS 13.340.10

Supersedes EN 465:1995, EN 466:1995, EN 467:1995

English version

Protective clothing against liquid chemicals - Performance requirements for clothing with liquid-tight (Type 3) or spray-tight (Type 4) connections, including items providing protection to parts of the body only (Types PB [3] and PB [4])

Vêtements de protection contre les produits chimiques liquides - Exigences relatives aux vêtements dont les éléments de liaison sont étanches au liquide (Type 3) ou aux pulvérisations (Type 4), y compris les articles d'habillement qui protègent seulement certaines parties du corps (Types PB (3) et PB (4))

Schutzkleidung gegen flüssige Chemikalien - Leistungsanforderungen an Chemikalienschutzanzüge mit flüssigkeitsdichten (Typ 3) oder spraydichten (Typ 4) Verbindungen zwischen den Teilen der Kleidung, einschließlich der Kleidungsstücke, die nur einen Schutz für Teile des Körpers gewähren (Typen PB [3] und PB [4])

This European Standard was approved by CEN on 14 February 2005.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 14605:2005: E

Contents

Foreword

This document (EN 14605:2005) has been prepared by 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 September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

This document supersedes EN 465:1995, EN 466:1995 and EN 467:1995.

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 89/686/EEC.

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

This document includes a Bibliography.

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

1 Scope

This document specifies the minimum requirements for the following types of limited use and reusable chemical protective clothing:

— Full-body protective clothing with liquid-tight connections between different parts of the clothing (Type 3: liquid-tight clothing) and, if applicable, with liquid-tight connections to component parts, such as hoods, gloves, boots, visors or respiratory protective equipment, which may be specified in other European Standards.
Examples of such clothing are one-piece coveralls or two-piece suits, with or without hood or visors, with or without boot-socks or over-boots, with or without gloves;

— Full-body protective clothing with spray-tight connections between different parts of the clothing (Type 4: spray-tight clothing) and, if applicable, spray-tight connections to component parts, such as hoods, gloves, boots, visors or respiratory protective equipment, which may be specified in other European Standards. Examples of such clothing are one-piece coveralls or two-piece suits, with or without hood or visors, with or without boot-socks or over-boots, with or without gloves;

— Partial body protection garments offering protection to specific parts of the body against permeation of chemical liquids.
Examples of such garments are e.g. laboratory coats, jackets, trousers, aprons, sleeves, hoods (not air-supplied) etc. As partial body protection leaves some parts of the body unprotected this document specifies only the performance requirements for the clothing material and the seams.

NOTE Partial body chemical protective garments which offer only protection against penetration of chemical liquids are within the scope of EN 13034 (Type PB [6] clothing).

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 340:2003, *Protective clothing — General requirements.*

EN 463, *Protective clothing - Protection against liquid chemicals - Test method: Determination of resistance to penetration by a jet of liquid (Jet Test).*

EN 468, *Protective clothing - Protection against liquid chemicals - Test method: Determination of resistance to penetration by spray (Spray Test).*

EN 12941:1998, *Respiratory protective devices - Powered filtering devices incorporating a helmet or a hood - Requirements, testing, marking.*

EN 14325:2003, *Protective clothing against chemicals — Test methods and performance classification of chemical protective clothing materials, seams, joins and assemblages.*

EN 23758, *Textiles - Care labelling code using symbols (ISO 3758:1991).*

EN 31092, *Textiles — Determination of physiological properties — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded - hotplate test) (ISO 11092:1993).*

CEN ISO/TR 11610:2004, *Protective clothing - Vocabulary (ISO/TR 11610:2004).*

ISO 7000, *Graphical symbols for use on equipment — Index and synopsis.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN ISO/TR 11610:2004 apply.

4 Requirements

4.1 Materials

Chemical protective clothing materials shall be tested according to the requirements of Table 1 and in accordance with the test methods specified in EN 14325. A performance level of at least 1 shall be obtained for all requirements.

Chemical protective clothing materials shall not be known to cause skin irritation or have any adverse effect to health (see also EN 340:2003, 4.2).

Prior to testing, all chemical protective clothing materials shall be cleaned, if the manufacturer's instructions indicate that cleaning is allowed. Manufacturer's instructions with regard to number of cleaning cycles, cleaning procedures and possible reapplication of treatments shall be observed. If no maximum number of cleaning cycles is indicated, materials shall undergo five cycles.

All test specimens shall be conditioned at (20 ± 2) °C and (65 ± 5) % relative humidity for at least 24 h and testing shall start within 5 min after removing the specimen from the conditioning atmosphere.

Table 1 — Test requirements for Type 3, Type 4, Type PB [3] and Type PB [4] clothing

Clause in EN 14325:2003	Performance requirement
4.4	abrasion resistance
4.5	flex cracking resistance
4.6 [a]	flex cracking resistance at –30 °C
4.7	tear resistance (trapezoidal)
4.9	tensile strength
4.10	puncture resistance
4.11	resistance to permeation of liquids
4.14	resistance to ignition
[a] Only applicable to clothing intended for use at very low temperatures.	

NOTE 1 Chemical protective clothing material, for which a test method in Table 1 does not provide a clear measurement end-point, should be marked "not applicable" in the test report and in the instructions for use. The reason why the test could not be completed should be indicated, e.g. where the elasticity of the specimen prevents to determine an end-point in the puncture resistance test.

NOTE 2 Materials should be as light and as flexible as possible in order to ensure wearer comfort as well as providing effective protection. Material properties are only one element for the determination of wearer comfort of protective clothing. Design features of the clothing may even have a more important influence on wearer comfort than material properties.

4.2 Seams, joins and assemblages

Seams, joins and assemblages shall be tested and classified according to the requirements of Table 2 and the corresponding clauses of EN 14325.

Table 2 — Requirements for seams, joins and assemblages of Type 3, Type 4, Type PB [3][a] and Type PB [4] clothing

Performance requirement	Reference
resistance to permeation of liquids [b]	EN 14325:2003, 4.11
resistance to penetration by liquids [c]	EN 463 or EN 468
seam strength	EN 14325:2003, 5.5

[a] Seams, joins and assemblages of Type PB [3] clothing shall be tested to the jet test (EN 463).

[b] Applicable only to seams which are exposed in use. For partial body protection items only seams relevant to the construction shall be considered and a performance level of at least 1 shall be obtained.

[c] To be tested by whole suit tests, i.e. EN 463 (jet test) for Type 3 clothing and EN 468 (high level spray test) for Type 4 clothing.

4.3 Performance requirements for whole suits (Types 3 and 4)

4.3.1 General

Chemical protective clothing shall fulfil the relevant requirements of EN 340. The clothing shall be made so that the wearer has freedom of movement and is as comfortable as possible, consistent with the protection afforded by the garment, as can be verified by the "seven movements" test, described in 4.3.4.1.

NOTE 1 Wearer comfort can be judged in wear trials of the suit with test persons experienced in the type of work and environments for which the suits are intended as protective clothing.

Chemical protective clothing Type 3 and Type 4 shall fulfil the requirements specified in 4.3.4 (Table 3), when combined with additional protective equipment, i.e. for protection of hands, feet, face, head and/or respiratory tract, according to the manufacturer's instructions and when tested as a complete suit.

The requirements of this clause apply to the garment as a whole including component parts (e.g. gloves, boots, hoods or respirators) that are not integral to the garment. The joins and assemblages attaching these components are included within the scope of this document, whereas criteria for the components are given in other European Standards.

NOTE 2 Partial body protection covers only specific areas of the body, leaving others exposed to the hazard. Because of this only limited testing of this type of clothing is appropriate and this product standard is defined accordingly.

4.3.2 Pre-conditioning

Prior to testing, the chemical protective clothing shall be cleaned, if the manufacturer's instructions indicate that cleaning is allowed. Manufacturer’s instructions with regard to number of cleaning cycles, cleaning procedures and possible reapplication of treatments shall be observed. If no maximum number of cleaning cycles is indicated, the clothing shall undergo five cleaning cycles.

4.3.3 Conditioning

All chemical protective clothing shall be conditioned for at least 24 h at the same conditions as used for the test.

4.3.4 Resistance to penetration by liquids

4.3.4.1 General and preliminary testing

Type 3 chemical protective clothing shall be tested against penetration by liquids by means of a jet test in accordance with 4.3.4.3.

Type 4 chemical protective clothing shall be tested against penetration by liquids by means of a spray test in accordance with 4.3.4.2.

Partial body protection items Type PB [4] shall not be tested against these criteria. Seams, joins and assemblages of Type PB [3] clothing shall be tested to the jet test (EN 463) (see also Table 2, footnote a)).

Prior to testing each suit in accordance with EN 463 or EN 468, a practical test shall be carried out by a human test subject. If more than one size of chemical protective suit is manufactured, the test subject will be asked to select the appropriate size according to the manufacturer's information leaflet. If applicable, the test subject shall also wear additional personal protective equipment, as specified in the manufacturer's instructions.

The test shall comprise three repetitions, at moderate speed, of the "seven movements" sequence described below.

Starting from a standing position in each case, carry out the following movement sequence:

— movement 1: kneel on both knees, lean forward and place both hands on the floor (45 ± 5) cm in front of the knees; crawl forward and backwards on hands and knees for a distance of three metres in each direction;

— movement 2: climb a vertical ladder at least four steps, rungs to be as encountered on a typical ladder;

— movement 3: position hands at chest level, palms out; reach directly overhead, interlock thumbs, extend arms fully upwards;

— movement 4: kneel on right knee, place left foot on floor with left knee bent (90 ± 10) °; touch thumb of right hand to toe of left shoe. Repeat movement with alternate posture, i.e. by kneeling on left knee and placing the right foot on the floor with knee bent at 90°;

— movement 5: extend arms fully in front of body, lock thumbs together, twist upper body (90 ± 10) ° left and right;

— movement 6: stand with feet shoulder width apart, arms at side; raise arms until they are parallel to the floor in front of the body; squat down as far as possible;

— movement 7: kneel as in movement 4, left arm hanging loosely at side; raise arm fully overhead. Repeat movement with alternate posture by alternating arms.

If the test subject is not able to perform one or several movements due to the hindrance of the suit or if the movements result in substantial damage to the suit, the suit shall be considered to have failed.

Suits equipped with a visor shall also pass the tests specified in 4.4 before further testing. Failure will result in a disqualification for further testing and the suit shall be considered to have failed.

4.3.4.2 Resistance to penetration by liquids (spray test)

Three new suits, pre-conditioned in accordance with 4.3.2, shall be tested in accordance with EN 468. If applicable, the suits shall be worn with the additional personal protective equipment specified in the manufacturer's instructions.