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Rękawice chroniące przed niebezpiecznymi substancjami chemicznymi i mikroorganizmami

Część 2: Wyznaczanie odporności na przesiąkanie

Norma Europejska EN 374-2:2014 *Protective gloves against dangerous chemicals and micro-organisms – Part 2: Determination of resistance to penetration* ma status Polskiej Normy

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Przedmowa krajowa

Niniejsza norma została zatwierdzona przez Prezesa PKN dnia 24 kwietnia 2015 r.

Komitetem krajowym odpowiedzialnym za normę jest KT nr 21 ds. Środków Ochrony Indywidualnej Pracowników.

Istnieje możliwość przetłumaczenia normy na język polski na wniosek zainteresowanych środowisk. Decyzję podejmuje właściwy Komitet Techniczny.

Niniejsza norma zastępuje PN-EN 374-2:2005.

Odpowiedniki krajowe norm i innych dokumentów powołanych w niniejszej normie można znaleźć w katalogu Polskich Norm. Oryginały norm i innych dokumentów powołanych są dostępne w PKN.

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Nota uznaniowa

Norma Europejska EN 374-2:2014 została uznana przez PKN za Polską Normę PN-EN 374-2:2015-04.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 374-2

December 2014

ICS 13.340.40

Supersedes EN 374-2:2003

English Version

Protective gloves against dangerous chemicals and micro-organisms - Part 2: Determination of resistance to penetration

Gants de protection contre les produits chimiques et les micro-organismes dangereux - Partie 2 : Détermination de la résistance à la pénétration

Schutzhandschuhe gegen gefährliche Chemikalien und Mikroorganismen - Teil 2: Bestimmung des Widerstandes gegen Penetration

This European Standard was approved by CEN on 22 November 2014.

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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 374-2:2014 (E)

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Foreword

This document (EN 374-2:2014) 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 June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

This document supersedes EN 374-2:2003.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] 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.

The major changes in comparison to EN 374-2:2003 are:

- reference to EN 374-3 changed to EN 16523-1;
- no classification concerning effective barrier to micro-biological hazards by resistance to penetration;
- clearer wording in test principles and test report;
- informative Annex A (AQL) not be tested, for the purpose of production control only, e. g. by the manufacturer or auditing organization.

EN 374 consists of the following parts under the general title, *Protective gloves against chemicals and micro-organisms*:

- Part 1: *Terminology and performance requirements*
- Part 2: *Determination of resistance to penetration*
- Part 3: *Determination of resistance to permeation by chemicals*
- Part 4: *Determination of resistance to degradation by chemicals*
- Part 5: *Terminology and performance requirements for micro-organisms risks*

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 374-2:2014 (E)

1 Scope

This European Standard specifies a test method for the penetration resistance of gloves that protect against dangerous chemicals and/or micro-organisms.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 374-1, *Protective gloves against chemicals and micro-organisms - Part 1: Terminology and performance requirements*

ISO 2859 (all parts), *Sampling procedures and tables for inspection by attributes*

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN 374-1 apply.

4 Principle of tests

4.1 Air leak test

A glove is immersed in water, and its interior is pressurised with air. A leak is detected by a stream of air bubbles from the surface of the glove.

4.2 Water leak test

A glove is filled with water. A leak is detected by the appearance of water droplets on the outside of the glove.

4.3 Remarks

The air leak procedure is not suitable for all gloves. For example parts of some gloves may be overinflated while other parts of the same gloves can only be partially inflated. If the air leak test proves unsuitable, then only the water penetration test is carried out.

For both methods disregard leaks within the area of 40 mm from the edge of the liquid proof area.

5 Sampling

For the purpose of testing, the test sample will be one glove of each size, with an overall minimum of 4 samples per performed test.

For certain reasons some gloves cannot be tested, e.g. non-homogenous overinflating of the samples or thickness of the liners disables the fitting on the mandrel.

If one sample fails the penetration test, the test shall be reported as having failed.

For the purpose of production control, e. g. by the manufacturer or auditing organisation, see Annex A.

6 Apparatus

6.1 Air leak test

6.1.1 A circular fixing mandrel, tapered with an appropriate diameter range to effect an airtight seal with the glove to be tested. It should be capable of rotation through 180°.

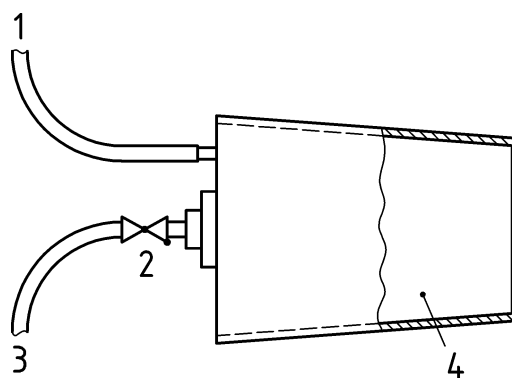
6.1.2 Means of air inflation.

6.1.3 Water tank.

6.1.4 Pressure gauge reading 0 kPa to 10 kPa.

6.1.5 Means of regulating the desired pressure.

Figure 1 and Figure 2 show an example of a suitable apparatus.

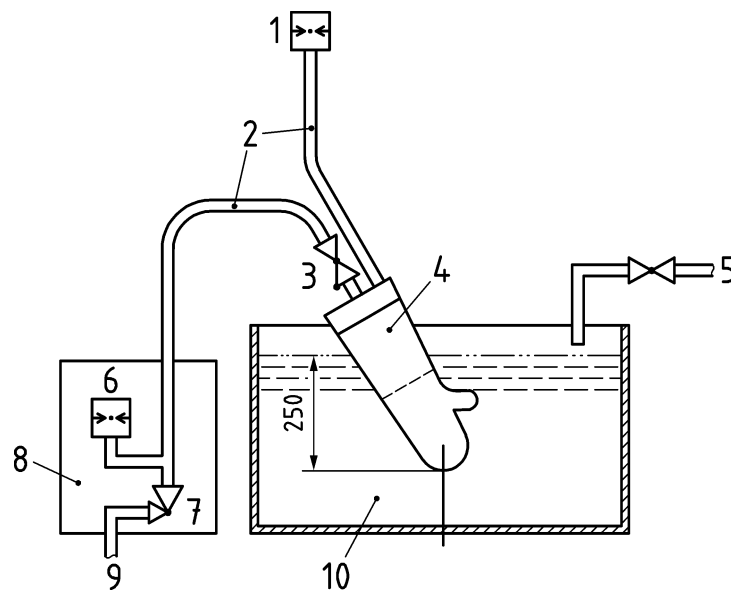


Key

- 1 To pressure gauge
- 2 Non-return valve
- 3 To instrument panel
- 4 Circular fixing mandrel

Figure 1 — Enlarged detail of the circular fixing mandrel

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Key

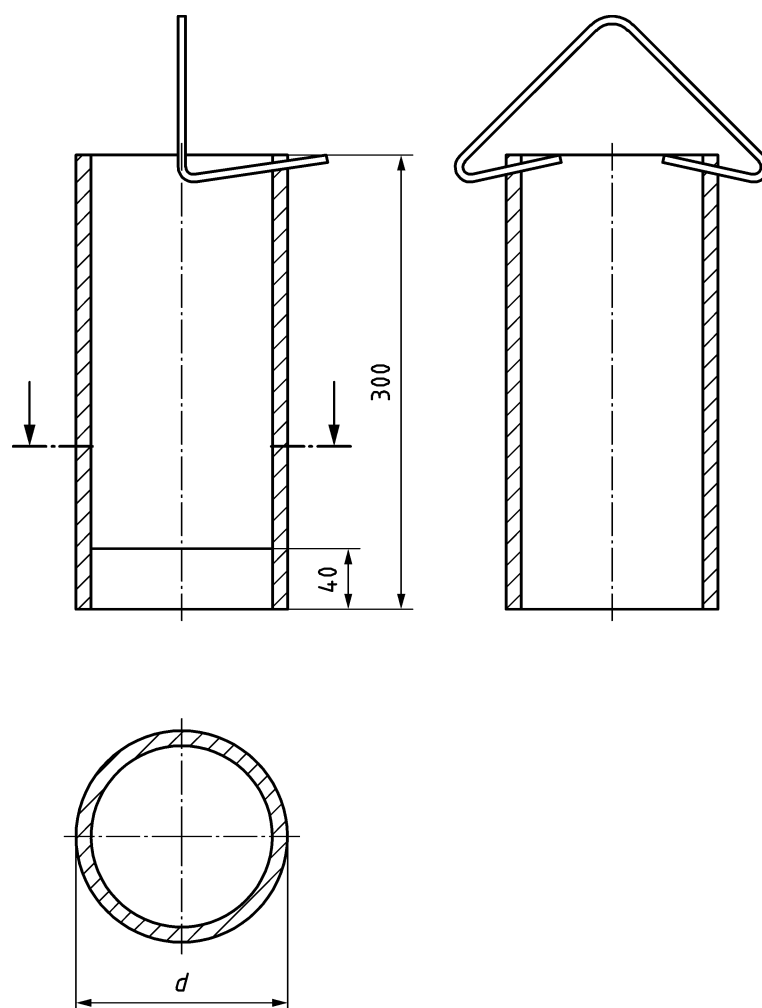
- | | |
|---------------------------|-------------------------|
| 1 Pressure gauge | 6 Pressure gauge |
| 2 Flexible pipes | 7 Pressure regulator |
| 3 Non return valve | 8 Instrument panel |
| 4 Circular fixing mandrel | 9 Compressed air supply |
| 5 Water supply | 10 Tank |

Figure 2 — Typical arrangement of air pressure testing apparatus

6.2 Water leak test

6.2.1 A clear open ended plastic tube is fitted with a hook at the upper end. The tube measures 380 mm in length and has a diameter wide enough to fit the gloves under test. It has a mark 40 mm from the lower end (see Figure 3).

Dimensions in millimetres

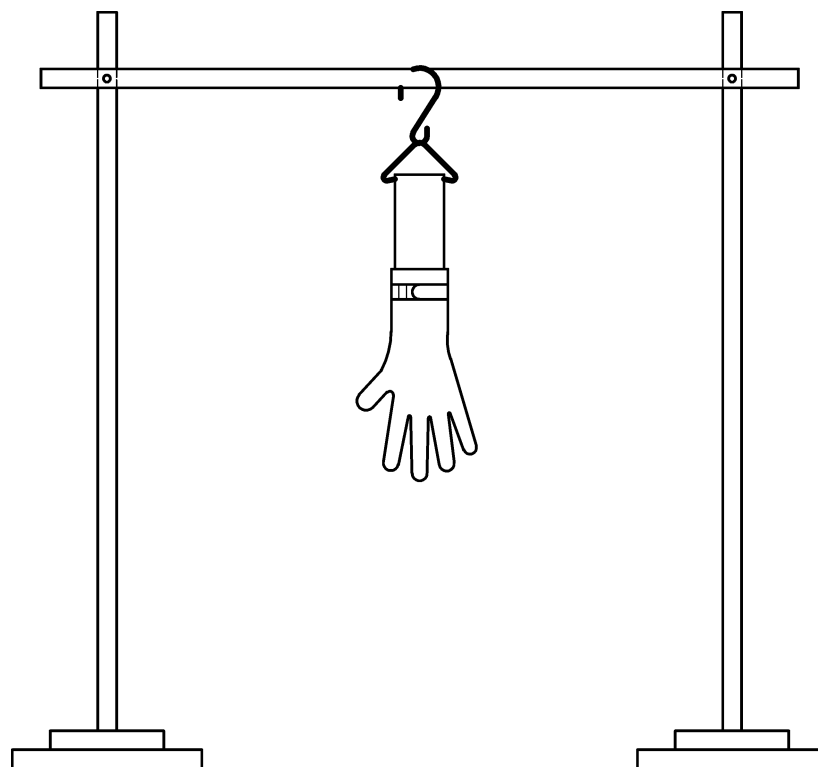
**Figure 3 — Filltube with a hook**

6.2.2 Elastic strapping with a "touch and close" fastener or other fastening material.

6.2.3 Stand with horizontal rod for hanging the hook end of the tube (see Figure 4). The supported rod shall be capable of taking the weight of the total number of gloves that will be suspended at any one time.

6.2.4 A device capable of delivering a minimum of 1 000 ml water.

6.2.5 An alternative means of holding the glove may be used. The apparatus shall be capable of securing the glove on a mandrel, with a diameter appropriate to fit the glove, so that it can be filled with water to within 40 mm from the edge of the liquid proof area. It shall be capable of holding water in excess of that required to fill the glove.

EN 374-2:2014 (E)**Figure 4 — Stand for suspending the filltube****7 Procedure****7.1 General**

Carefully remove the glove from the wrapper, box or its packaging. Record the identity code, lot number, size and brand of samples. Visually examine for tears, rips and holes. If these are present, the gloves shall be reported as having failed.

7.2 Air leak test

7.2.1 The glove is fastened to the circular mandrel and is inflated after immersion at ambient temperature, with air, to a gauge pressure of X kPa (see Table 1) plus an overpressure of 1 kPa per 100 mm of immersion measured at the fingertips closest to the bottom of the water tank. For example, for 250 mm of immersion at the fingertips, 2,5 kPa shall be added to the air pressure specified in Table 1.

The inflation pressure shall be reached with a $\pm 10\%$ limit deviation within 2 min and the control of possible air bubbles shall take an additional (30 ± 5) s.

Table 1 — Air pressure

Nominal glove thickness (e) mm As provided by the manufacturer	Air pressure (X) kPa
$e \leq 0,3$	0,5
$0,3 < e \leq 0,5$	2,0
$0,5 < e \leq 1,0$	5,0
$e > 1,0$	6,0

7.2.2 For gloves up to 250 mm in length the immersion shall be carried out with the hand vertically downwards so that the water covers the maximum possible surface of the glove.

For gloves over 250 mm in length the immersion is to be carried out, with the hand at a downward angle, to a vertical depth of (250 ± 10) mm above the tip of the middle finger and so that the water covers the maximum possible surface of the glove. Rotate the mandrel and examine the whole glove surface for the emergence of air bubbles (see Figure 2).

7.3 Water leak test

7.3.1 The glove is attached to an open-ended plastic tube by bringing the edge of the cuff to the 40 mm mark (see Figure 3) and fastening it with the elastic strap to make a watertight seal.

7.3.2 A minimum of 1 000 ml of water is added through the tube to fill the glove completely and to reach at least the 40 mm mark level of the liquid proof area of the glove. The water shall be at ambient temperature.

Some of the 1 000 ml of water may remain in the fill tube depending on the glove being tested.

If it is required, the glove can be supported by some suitable means in order to avoid excessive distortion from the weight of water.

7.3.3 The gloves are examined immediately for water leaks. The glove should not be squeezed. Only minimal handling is required to detect leaks. Water droplets may be blotted to confirm leakage, or talcum powder may be used to enhance droplet visibility.

7.3.4 If the glove does not leak immediately, the tube with the glove attached is suspended vertically (see Figure 4) and re-examined 2 min (± 10 s) after the initial addition of water. Again, using minimum handling, the glove surface is checked for leaks.

8 Test report

The test report shall include:

- A reference to this International Standard;
- Full identity of the tested glove;
- Visual inspection: pass or fail;
- Air leak test and water leak test: pass or fail;
- For the air leak test: air pressure used;
- Reason of non-testing of any of the penetration tests;
- Reporting of any deviation to the present standard.

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Annex A

(informative)

Informative annex to be used for quality assurance during production

Gloves from a single lot or batch shall be sampled and inspected in accordance with ISO 2859 (all parts). The inspection levels and acceptable quality levels (AQL) shall comply with those given in Table A.1 or as agreed between the purchaser and the seller, if the latter is more stringent.

Table A.1 — Inspection levels and acceptable quality levels

Performance level	Acceptable quality level unit	Inspection levels
Level 3	< 0,65	G1
Level 2	< 1,5	G1
Level 1	< 4,0	S4