

# SLOVENSKI STANDARD

## SIST EN 374-2:1996

01-februar-1996

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### Varovalne rokavice za zaščito pred kemikalijami in mikroorganizmi - 2. del: Določanje odpornosti na penetracijo

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

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

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

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Ta slovenski standard je istoveten z: **EN 374-2:1994**

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#### **ICS:**

13.340.40      Varovanje dlani in rok      Hand and arm protection

**SIST EN 374-2:1996**

**en**

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EUROPEAN STANDARD

EN 374-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1994

UDC 614.896.2:614.878:573.4:620.165.29

Descriptors: Personal protective equipment, work clothing, accident prevention, protective clothing, gloves, chemical compounds, micro-organisms, tests, water tightness, gas permeability, leak detection

English version

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

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

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

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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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

This European Standard was prepared by CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets" of which the secretariat is held by DIN.

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

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 July 1994, and conflicting national standards shall be withdrawn at the latest by July 1994.

In accordance with the CEN/CENELEC Internal Regulations, following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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## 1 Scope

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

At this time it is believed that gloves which resist penetration, when tested according to this part of EN 374, will form an effective barrier to micro-biological hazards.

## 2 Principle of test

The primary test is an air leak test.

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

This 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 may only be partially inflated or not even filled at all with air. If the air leak test proves unsuitable, then a secondary test is carried out by filling a glove with water. A leak is detected by the appearance of water droplets on the outside of the glove.

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

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## 3 Sampling

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The test sample will be one glove irrespective of how the gloves are packaged, labelled, and offered for sale and use.

## 4 Apparatus

### 4.1 Air leak test

4.1.1 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 360°.

4.1.2 Means of air inflation

4.1.3 Water tank

4.1.4 Pressure gauge reading 0 kPa to 10 kPa

4.1.5 Means of regulating the desired pressure.

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

### 4.2 Water leak test

4.2.1 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).

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

4.2.3 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.

4.2.4 An automatic water dispenser or manual device capable of delivering a minimum of 1000 ml water.

4.2.5 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 cuff. It shall be capable of holding water in excess of that required to fill the glove.

## 5 Procedure

5.1 The sample is examined and identity code, lot number, size, and brand are recorded.

### 5.2 Air leak test

5.2.1 Carefully remove the glove from the wrapper, box etc..

5.2.2 Gloves are visually examined for tears, rips, and holes. If these are present, the gloves are reported as having failed visual examination.

5.2.3 The glove is fastened to the circular mandrel and is inflated under water at ambient temperature, with air, to a gauge pressure of X kPa (see table 1) over water pressure at the fingertips (i. e. X kPa + 1,0 kPa per 100 mm of immersion).

The inflation pressure tolerance shall be  $\pm 10\%$  and the immersion time shall not be less than 30 s.

Table 1

Nominal glove thickness	Air pressure (X)
mm	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

5.2.4 For gloves up to 400 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 400 mm in length the immersion is to be carried out, with the hand at a downward angle, to a vertical depth of  $(400 \pm 10)$  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).

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5.2.5 If this test cannot be successfully completed (see clause 2) discard the sample and carry out the following procedure on a fresh sample.

### 5.3 Water leak test

5.3.1 Carefully remove the glove from the wrapper, box etc..

5.3.2 Gloves are visually examined for tears, rips and holes. If these are present the gloves are reported as having failed visual examination.

5.3.3 The glove is attached to 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.

5.3.4 1000 ml of water is added through the tube to fill the glove completely and to reach the 40 mm mark level. The water shall be at ambient temperature.

It may be necessary to add in excess of 1000 ml to fill the glove and tube to the 40 mm mark.

Note 1: Some of the 1000 ml of water may remain in the fill tube depending on the glove being tested.

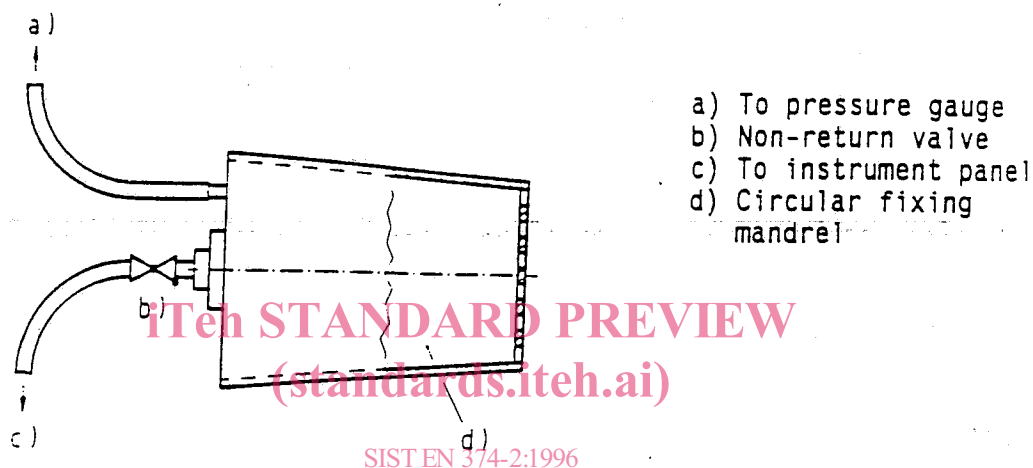
Note 2: If it is required, the glove may be supported by some suitable means in order to avoid excessive distortion from the weight of water.

5.3.5 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.

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

## 6 Test report

Record whether the glove passes or fails.



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Figure 1: Enlarged detail of the circular fixing mandrel

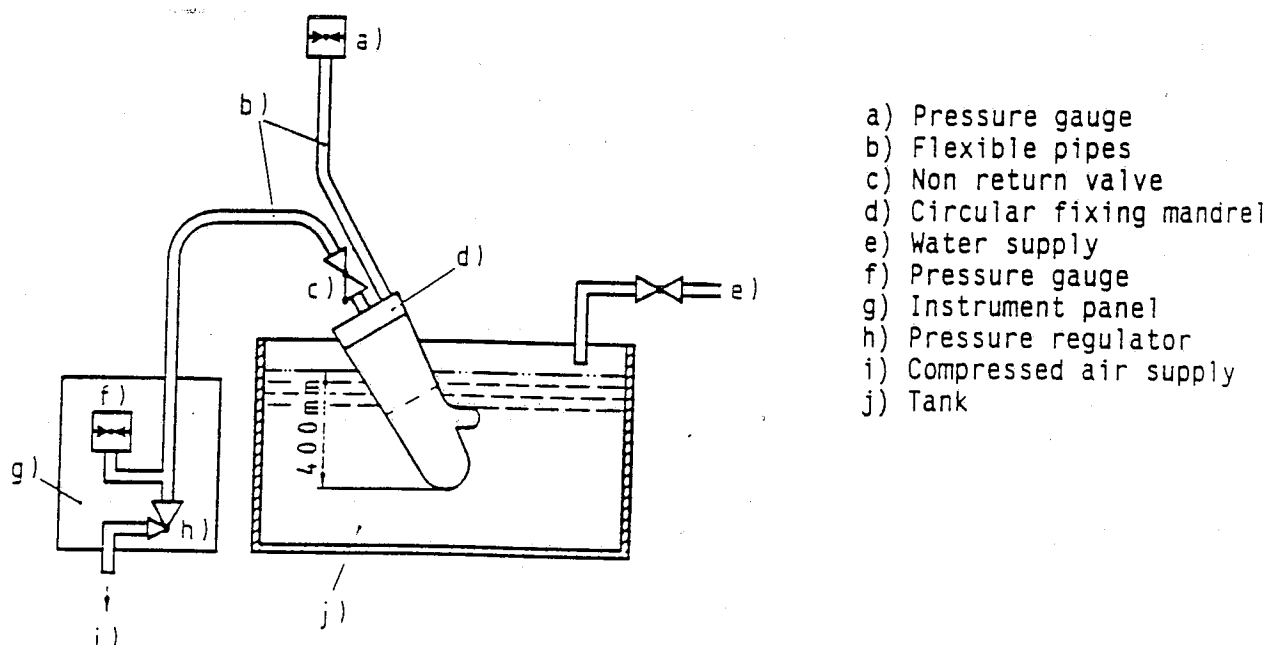


Figure 2: Typical arrangement of air pressure testing apparatus