EUROLAB Laboratory Services

TEST / INSPECTION REPORT

EUROLAB LABORATORY SERVICES

TÜRCERT TEKNİK KONTROL VE BELGELENDİRME A.Ş.

UNITED ACCREDITATION FOUNDATION UAF

5190243IB02

2021111259

Report No:	2021111259-R1
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Sample Accepted on:	05.11.2021
Report Date:	12.11.2021
Total number of pages:	11 (Pg)
Sample ID:	**112021-05** **112021-08** **112021-10**

	TEST	METHOD	SPECIMEN	RESULT
*	Protective gloves against dangerous chemicals and micro-organisms - Part 1: Terminology and performance requirements for chemical risks	EN 374-1	112021-05 112021-08 112021-10	PASS
*	Protective Gloves Against Dangerous Chemicals And Micro-Organisms - Part 2: Determination Of Resistance To Penetration	EN 374-2	112021-05 112021-08 112021-10	PASS
*	Determination Of Material Resistance To Permeation By Chemicals - Part 1: Permeation By Potentially Hazardous Liquid Chemicals Under Conditions Of Continuous Contact	EN 16523-1 (EN 374-3)	112021-05 112021-08 112021-10	PASS
*	Protective gloves against dangerous chemicals and micro-organisms - Part 4: Determination of resistance to degradation by chemicals	EN 374-4	112021-05 112021-08 112021-10	PASS
*	Protective gloves against dangerous chemicals and microorganisms - Part 5: Terms and performance rules for microorganism risks.	EN 374-5	112021-05 112021-08 112021-10	PASS

EUROLAB LABORATORY SERVICES APPROVED

Seal

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Environment

The requirements and standards apply to equipment intended for use in

X	Residential (domestic) environment
X	Commercial and light-industrial environment
X	Industrial environment
X	Medical environment

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EN 374-1 Protective Gloves Against Dangerous Chemicals And Micro-Organisms – Part 1: Terminology And Performance Requirements For Chemical Risks

Scope

This part of ISO 374 specifies requirements for protective gloves that are intended to protect the user against dangerous chemicals and defines the terms to be used

General

Sampling for permeation

Each material sample to be tested must meet the requirements of EN 16523-1: 2015, Section 7, so that the material can be sealed in the test cell.

Three samples are to be taken from the palm of the hand. If the glove is 400 mm or longer and protection against chemical risks is specified for the cuff, take three additional samples with the middle 80 mm from the cuff.

Sampling for the penetration test

Sampling for penetration must be carried out in accordance with EN 374-2: 2014, Section 5.

Sampling for the degradation test

Sampling for degradation must be carried out in accordance with 4.1 and EN 374-4: 2013, Section 5.1.

General requirements

Protective gloves against dangerous chemicals must meet the requirements in EN 420: 2009, Section 4, Section 5 and Section 7.

Penetration

Protective gloves must not leak when testing according to EN 374-2: 2014, 7.2 and 7.3.

Degradation

The degradation (DR) must be determined in accordance with EN 374-4 for each chemical that is specified on the label and listed in the user information.

For gloves that are longer than 400 mm and in which the palm of the hand and the cuff have different performance levels, the lower performance level must be specified on the label for each chemical.

Protective gloves against chemicals are classified into three types according to their permeation performance: Type A, Type B or Type C.

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EN ISO 374-1 Glove Permeation Test List

Code Letter	Chemical	Cas Number	Class
A	Methanol	67-56-1	Primary Alcohol
B	Acetone	67-64-1	Ketone
C	Acetonitirle	75-05-8	Nitrile Compound
D	Dichloromethane	75-09-2	Chlorinated Paraffin
E	Carbon disulphide	75-15-0	Sulphur Containing Organic
F	Toluene	108-88-3	Aromatic Hydrocarbon
G	Diethylamine	109-89-7	Amine
H	THF	109-99-9	Heterocyclic and Ether
I	Ethyl Acetate	141-78-6	Ester
J	N-Heptane	142-82-5	Saturated Hydrocarbon
K	Sodıum Hydroxyde %40	1310-73-2	Inorganıc Base
L	Sulphurıc Acid %10	7664-93-9	Inorganıc Mineral Acid
M	Nitric Acid %65	7697-37-2	Inorganıc Acide , oxidizing
N	Acetic Acide %99	64-19-7	Organic acid
O	Ammonia %25	1336-21-6	Oraganic Base
P	Hydrogen peroxide %30	7722-84-1	Peroxide
S	Hydrogen flüoride %4,	7664-39-3	Inorganic Mineral Acid
T	Formaldehyde %37	50-00-0	Aldehyde

Test Results

Specimen	Chemical	Exposure Time	Observation	Gloves Type
G21T2701 (S-M-L)	Toluene	480 min (Level 6)	Not permeable	EN ISO 374-1:2016 TYPE A  FJKLPT
G21T2701 (S-M-L)	N-Heptane	480 min (Level 6)	Not permeable	
G21T2701 (S-M-L)	Sodıum Hydroxyde	480 min (Level 6)	Not permeable	
G21T2701 (S-M-L)	Sulphurıc Acid	480 min (Level 6)	Not permeable	
G21T2701 (S-M-L)	Hydrogen peroxide	480 min (Level 6)	Not permeable	
G21T2701 (S-M-L)	Formaldehyde	480 min (Level 6)	Not permeable	

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EN 374-2 Protective Gloves Against Dangerous Chemicals And Micro-Organisms - Part 2: Determination Of Resistance To Penetration

SCOPE

This standard describes the criteria that protective gloves should have, especially in terms of contact risks with microorganisms such as bacteria, fungi and viruses.

Air Leak Test Method

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

Table 1

Nominal glove thickness (e) mm As provided by the manufacturer	Air pressure (X) kPa
e ≤ 0,3	0,4
0,3 < e ≤ 0,5	2,0
0,5 < e ≤1,0	5,0
e > 1,0	5,0

Test Result

Specimen	Total Air Pressure (kPa)	Observation	Result
G21T2701 (S)	0,4	No leaks detected	PASS
G21T2701 (M)	0,4	No leaks detected	PASS
G21T2701 (L)	0,4	No leaks detected	PASS

Water Leak Test Method

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

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Test Results

Specimen	Observation	Result
G21T2701 (S)	No leaks deteced	PASS
G21T2701 (M)	No leaks deteced	PASS
G21T2701 (L)	No leaks deteced	PASS

EN 16523-1 Determination Of Material Resistance To Permeation By Chemicals - Part 1: Permeation By Potentially Hazardous Liquid Chemicals Under Conditions Of Continuous Contact

Test Method

The resistance of a protective glove material to permeation by a solid or liquid chemical is determined bymeasuring the breakthrough time of the chemical through the glove material.

The sample shall be conditioned for 24 h at a temperature of (23±2) °C and The standard test temperature shall be (23±1) °C.

Permeation Performance Level	Measured Breakthrough Time (min.)
1	>10
2	>30
3	>60
4	>120
5	>240
6	>480

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Test Results

Chemicals	Cas Number	Performance Level			Break Through Time (min)		
		S	M	L	S	M	L
Methanol	67-56-1	6	6	6	>480	>480	>480
Acetone	67-64-1	6	6	6	>480	>480	>480
Acetonitirle	75-05-8	6	6	6	>480	>480	>480
Dichloromethane	75-09-2	6	6	6	>480	>480	>480
Carbon disulphide	75-15-0	-	-	-	N.A	N.A	N.A
Toluene	108-88-3	6	6	6	>480	>480	>480
Diethylamine	109-89-7	6	6	6	>480	>480	>480
THF	109-99-9	6	6	6	>480	>480	>480
Ethyl Acetate	141-78-6	-	-	-	N.A	N.A	N.A
N-Heptane	142-82-5	-	-	-	N.A	N.A	N.A
Sodıum Hydroxyde %40	1310-73-2	6	6	6	>480	>480	>480
Sulphurıc Acid %10	7664-93-9	6	6	6	>480	>480	>480
Nitric Acid %65	7697-37-2	6	6	6	>10	>10	>10
Acetic Acide %99	64-19-7	6	6	6	>480	>480	>480
Ammonia %25	1336-21-6	-	-	-	>240	>240	>240
Hydrogen peroxid e %30	7722-84-1	6	6	6	>480	>480	>480
Hydrogen flüoride %4,	7664-39-3	-	-	-	N.A	N.A	N.A
Formaldehyde %37	50-00-0	-	-	-	>480	>480	>480

I*=Immediately

Chemotherapy Drugs	Performance Level			Break Through Time (min)		
	S	M	L	S	M	L
Carmustine (BCNU)	6	6	6	>480	>480	>480
Cisplatin	6	6	6	>480	>480	>480
Cyclophosphamide	6	6	6	>480	>480	>480
Dacarbazine	6	6	6	>480	>480	>480
Doxorubicin Hydrochloride	6	6	6	>480	>480	>480
Ellence	6	6	6	>480	>480	>480
Etoposide (Toposar)	6	6	6	>480	>480	>480
Fluorouracil	6	6	6	>480	>480	>480
Ifosfamide	6	6	6	>480	>480	>480
Methotrexate	6	6	6	>480	>480	>480
Mitomycin C	6	6	6	>480	>480	>480
Mitoxantrone	6	6	6	>480	>480	>480
Paclitaxel (Taxol)	6	6	6	>480	>480	>480
Thiotepa	6	6	6	>480	>480	>480
Vincristine Sulfate	6	6	6	>480	>480	>480

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BODE disinfectants and detergents	Performans Level			Break Through Time (min)		
	S	M	L	S	M	L
Baccalin 100 %	6	6	6	>480	>480	>480
Bacillol 30 Foam	6	6	6	>480	>480	>480
Bacillol AF 100 %	6	6	6	>480	>480	>480
Bomix plus 2 % (for the detection of organic species)	6	6	6	>480	>480	>480
Bomix plus 100 % (for the detection of ionic species)	6	6	6	>480	>480	>480
Dismozon pur 4 %	6	6	6	>480	>480	>480
Kohrsolin extra 0,5 % (testing for formaldehyde)	6	6	6	>480	>480	>480
Kohrsolin FF 100 % (For detection of glutaraldehyde)	6	6	6	>480	>480	>480
Korsolex basic 100 % (testing for formaldehyde)	6	6	6	>480	>480	>480
Korsolex extra 4 % (for the detection of organic species)	6	6	6	>480	>480	>480
Korsolex plus 3 % (detection of ionic species)	6	6	6	>480	>480	>480
Korsolex plus 100 % (detection of organic species)	6	6	6	>480	>480	>480
Mikrobac food 100 %	6	6	6	>480	>480	>480

EN 374-4 Protective gloves against dangerous chemicals and microorganisms - Part 4: Determination of resistance to degradation by chemicals

Principle

The resistance of a protective glove material to degradation by a liquid chemical is determined by measuring the change in puncture resistance of the glove material after continuous contact of the external surface with the challenge test chemical. The test is applicable to gloves made of natural or synthetic polymer.

Procedure

The test shall be conducted at (23 ± 2) °C (preparation, chemical, exposure to chemical, and puncture test).

Place a glove specimen on top of the septum with its normal external surface facing towards the interior of the vial. Place the aluminium cap with the specimen on top of the vial. Seal the vial using the hand crimper and invert it so that the challenge chemical is in contact with the specimen (see Figure 1). Record the time. Place the vial in the punched-out sample holder

The punched-out sample holder has a twofold purpose:
a) It allows air to circulate under the sample film, and

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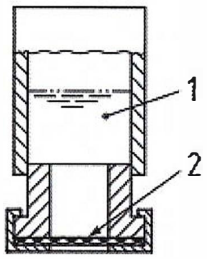
b) if the pressure from the challenge chemical forces the sample into a convex shape, the flask will still stand



Key

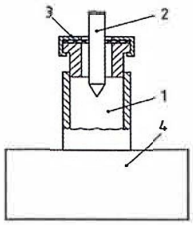
1 challenge chemical

2 outer surface of the glove specimen which is in contact with the challenge chemical, it is a circular area of (12,5 ± 0,5) mm diameter

Figure 1 — Position of the vial during contact time between the specimen and the challenge chemical

Puncture testing

Install the puncture stylus on the dynamometer load cell. Set the carriage speed to 100 mm/min and screw the vial support onto the table. Place a vial into the support. Puncture the specimen and record the peak force required (see Figure 2). Repeat for each of the specimens; test each of the exposed specimens one hour after the exposure on that specimen was started.



Key

1 20 ml crimp vial

2 puncture stylus 3 specimen 4 sample vial support (to be maintained by the dynamometer jaw)

Figure 2 — Position of the vial during puncture test

Test Results

The following degradation data (see Table A.1) have been obtained in laboratory.

Table A.1 — Results in % of correlation trial with other gloves materials

Sample	Toluene	N-Heptane	Sodıum Hydroxyde	Hydrogen peroxide	Formaldehyde	Acetone	Sulfuric Acid (%10)
	Mean value for Nitrile glove	Mean value for Nitrile glove	Mean value for Nitrile glove	Mean value for Nitrile glove	Mean value for Nitrile glove	Mean value for Nitrile glove	Mean value for Nitrile glove
1	%60	%62	%-9.2	%43	%50	%61	%20
2	%60	%64	%-9.3	%41	%51	%62	%22
3	%62	%63	%-9.3	%40	%50	%60	%21
4	%61	%62	%-9.4	%40	%52	%61	%20
5	%63	%62	%-9.7	%42	%50	%63	%21
6	%61	%62	%-9.4	%41	%51	%65	%21

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Weight Charge Test

Test Conditions

The glove should be conditioned at (23 ± 2) °C for at least 24 h. The specimens should be taken from three gloves. Put the glove flat on a surface and measure (60 ± 2) mm from fingertip. The specimens should consist of a cut-off of the same finger of each glove.

Procedure

Start the timer and immerse the finger specimen in a beaker containing the test chemical. The weighed test tube will hold the specimen upright in the beaker. The beaker should be filled to a depth of (42 ± 2) mm with the test chemical (see Figure B.1). The quantity of the test chemical should be adapted during the test to keep the beaker filled to the marking. Multiple finger specimens can be started at approximately 1 minute timed intervals to allow for weighing of the specimens.

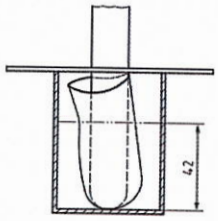

Figure B.1 — Typical arrangement of weight change test apparatus

The weighing of the finger specimen should be carried out as quickly as possible after the 60 min chemical exposure.

Result

After the Weight Charge Test, there was not observed any changes such as swelling, shrinking, brittleness, hardening, softening, flaking, disintegration, colour change/bleeding on the sample.

TS EN ISO 374-5:2016 Protective Gloves Against Dangerous Chemicals And Microorganisms - Part 5: Terms And Performance Rules For Microorganism Risks

Scope

This International Standard describes a laboratory test method for measuring the resistance of materials used in protective clothing to penetration by blood-borne pathogens. This test method uses a surrogate microbe under conditions of continuous liquid contact.

Test Conditions

Condition each protective clothing specimen for a minimum of 24 h by exposure to a temperature of (21 ± 5) °C and a relative humidity of (60 ± 10) %.

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Procedure

This test method was performed to evaluate the barrier performance of protective materials which are intended to protect against blood borne pathogen hazards. Test articles were conditioned for a minimum of 24 hours at 21 ± 5°C and 60 ± 10% relative humidity (RH), and then tested for viral penetration using a ϕX174 bacteriophage suspension. At the conclusion of the test, the observed side of the test article was rinsed with a sterile medium and assayed for the presence of ϕX174 bacteriophage.
The viral penetration method complies with ISO 16604. All test method acceptance criteria were met.

Result

Specimen: G21T2701 (S-M-L)

Tested Specimen Number	Pre-Challenge Concentration (PFU/mL)	Post-Challenge Concentration (PFU/mL)	Assay Titer (PFU/mL)	Observation	Result	Marking
1-6	3.40×10^8	3.10×10^8	<1[a]	Not Observed Improperly	PASS	EN ISO 374-5 :2016 VIRUS
Negative Control	3.40×10^8	3.10×10^8	<1[a]	Not Observed Improperly	Acceptable	
Positive Control	3.40×10^8	3.10×10^8	TNTC[b]	Yes	Acceptable	

[a] A value of <1 plaque forming units (PFU)/mL is reported for assay plates showing no plaques.
[b]TNTC = PFU were too numerous to count.

Sample Images

***End Of Report**

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