



**EKOTEKS LABORATUVAR ve GÖZETİM
HİZMETLERİ A.Ş.**
Esenyurt Firuzköy Bulvarı No:29 34325 Avcılar
İstanbul/ TÜRKİYE

TEST REPORT
DENEY RAPORU



| |
|--------------|
| AB-0583-T |
| 20030009-ing |
| 09-20 |

Customer name: FELİKS PLASTİK LAM. VE AMB. MAL SAN. VE TİC. LTD. ŞTİ.
Address: ESKİŞEHİR ORG. SAN. BÖL. 26. CAD. NO:9 26110 ESKİŞEHİR
Buyer name: -
Contact Person: ALİ SERDAR SERTESER
Order No: -
Article No: -
Name and identity of test item: White protective overalls.(White)
The date of receipt of test item: 21.08.2020
Re-submitted/re-confirmation date: -
Date of test: 21.08.2020-07.09.2020
Remarks: -
Sampling: The results given in this report belong to the received sample by vendor.
End-Use: -
Care Label: Not Specified
Number of pages of the report: 10

The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognition of test reports.

EKOTEKS LABORATUVAR ve GÖZETİM HİZMETLERİ A.Ş. accredited by TÜRKAK under registration number [AB-0583-T] for ISO 17025:2017 as test laboratory.

The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.



Date
08.09.2020

Customer Representative
Servin YURTSEVEN

Head of Testing Laboratory
Sevim A. RAZAK
08.09.2020

This report shall not be reproduced other than in full except with the permission of the laboratory.
Testing reports without signature and seal are not valid.

EKOTEKS LABORATUVAR ve GÖZETİM
HİZMETLERİ A.Ş.

AB-0583-T

20030009-
ing

09-20

| REQUIRED TESTS | RESULT | COMMENTS |
|--|--------|----------|
| PHYSICAL PROPERTIES TESTS | | |
| Abrasion | - | Class 6 |
| Water Permeability | - | Class 6 |
| Tear Strength | - | Class 2 |
| Tensile Strength | - | Class 1 |
| Repellency to Liquids | - | Class 2 |
| Resistance To Penetration By Liquids | - | Class 3 |
| Seam Strength | - | Class 1 |
| Determination of resistance to damage by flexing | - | Class 5 |
| Puncture Resistance | - | Class 1 |
| MICROBIOLOGICAL TESTS | | |
| Wet-Bacterial Penetration | - | Class 6 |
| Dry-Bacterial Penetration | - | Class 3 |
| Blood Splash Resistance | P | - |
| P: Pass F: Fail R: Refer to retailer technologist Tests were classified according to BS EN 14325:2018 BS EN 14126 :2003 Protective clothing —Performance requirements and tests methods for protective clothing against infective agents (1)Requirement was given by the vendor | | |

REMARK: Original samples are kept for 3 months and all technical records are kept for 5 years unless otherwise specified. If requested, measurement uncertainty will be reported. But unless otherwise specified, measurement uncertainty is not considered while stating compliance with specification or limit values The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95 %. Tests marked (*) in this report are not included in the accreditation schedule.



This report shall not be reproduced other than in full except with the permission of the laboratory.
Testing reports without signature and seal are not valid

AB-0583-T

20030009-
ing

09-20

TEST RESULTS

Test Method : BS EN 14325:2018 (PROTECTIVE CLOTHING AGAINST CHEMICALS:TEST METHODS AND PERFORMANCE CLASSIFICATION OF CHEMICAL PROTECTIVE CLOTHING MATERIALS,SEAMS,JOINS AND ASSEMBLAGES

ABRASION RESISTANCE AND LEAK TIGHTNESS

Clause 4.4.Abrasion Resistance (EN ISO 12947-2) ANNEX-B

Martindale Test Machine (47.5±2 rpm) with Lissajous Figure.

9 kPa pressure,

Performed in the conditioned room (20±2°C-65%±4).

RESULT

No abrasion @2.000 revs

CLASS

6

Classified according to the
Table-1

Determination of the highest number of abrasion rubs which does not cause damage to the material and which shall be used for the performance classification.

The abrasion resistance of sample shall be Classified according to the levels of performance given in Table-1

Table-1 Classification of Abrasion Resistance

| Class | Number of rubs |
|-------|----------------|
| 6 | >2000 |
| 5 | >1000 |
| 4 | >400 |
| 3 | >100 |
| 2 | >40 |
| 1 | >10 |

Clause 4.4.2.3 Hydrostatic head end –point determination (EN 20811)

If the average hydrostatic head exceeds 200mm,then the hydrostatic head method is applicable and the leak tightness shall be determined.

WATER PERMEABILITY ; EN ISO 20811:2018

Hydrostatic Head Tester, Textest marka Fx 3000 model

Temperature of water 10.°C. Pressure increase ratio 10 mbar/dk.

Performed in the conditioned room (20±2°C-65%±4)

Sample 1
Sample 2
Sample 3
Sample 4
Sample 5

RESULT

195.8 mm SS
512.0 mm SS
181.5 mm SS
206.0 mm SS
404.9 mm SS

REQUIREMENT

>200 mmSS

Average

300.1mm SS

AB-0583-T

20030009-
ing

09-20

TEST RESULT

TRAPEZOIDAL TEAR STRENGTH

Clause: 4.7. Trapezoidal Tear Resistance TS EN ISO 9073-4:2002

Instron 5969 Speed:100±10 mm/min, Gauge length:5cm

The average results are given for width and length direction of five samples.

2 pre-tension applied

Performed in the conditioned room. (20±2°C - 65% ±4)

Width **RESULT**
58.8 N

CLASS
2

Classified according to
the Table-4

Length 32.2 N

Table-4 Classification of Trapezoidal Tear Resistance

| Class | Tear Strength |
|-------|---------------|
| 6 | >150 N |
| 5 | >100 N |
| 4 | >60 N |
| 3 | >40 N |
| 2 | >20 N |
| 1 | >10 N |

TENSILE STRENGTH

Clause 4.9. Tensile Strength EN ISO 13934-1:2013

Instron 5969 (Load: 50 kN), Strip Method.

Speed: 100 mm/min±10, Gauge length 200 mm.

Pre-load was not applied. Without wetting samples.

The average results are given for width and length direction of five samples.

Performed in the conditioned room (20±2°C-65%±4).

Width **RESULT**
96.1 N

CLASS
1

Classified according to
the Table-5

Length 46.1 N

Table-4 Classification of Tensile Strength

| Class | Tensile Strength |
|-------|------------------|
| 6 | >1000 N |
| 5 | >500 N |
| 4 | >250 N |
| 3 | >100 N |
| 2 | >60 N |
| 1 | >30N |

TEST RESULT REPELLENCY TO LIQUIDS

Clause 4.12 Repellency to Liquids (EN ISO 6530:2005)

When tested in accordance with EN ISO 6530 for repellency to the liquid chemicals given in Table -9, the material shall be classified According to the levels performance in given Table-10 for each chemical tested.

Use those liquids against which protection is required, water is also convenient and safe liquid for general screening purposes. Performed in the conditioned room (20±2°C-65%±4).

For each test liquid ,cut six test specimens of (360±2)mm by (235±5)mm from the sample. Chemicals shall be of analytical purity grade.

Discharged the test liquid (10cm 3) within (10±1)s

Table-9 List of reference chemicals for absorption ,penetration and repellency testing

| Chemical | Concentration weight % | Temperature of chemical (±2°C) |
|---|------------------------|--------------------------------|
| Sulfuric Acid (H ₂ SO ₄) | 30 | 20 |
| Sodium Hydroxide (NaOH) | 10 | 20 |
| o-Xylene | Undiluted | 20 |

Table 10- Classification of Repellency to liquids

| Class | Repellency Index (I _R) |
|-------|------------------------------------|
| 3 | > 90 % |
| 2 | >80 % |
| 1 | >70 % |

Clause 4.13 Resistance to penetration by liquids (EN ISO 6530)

Table 11- Classification of Resistance to penetration by liquids

| Class | Penetration Index (I _P) |
|-------|-------------------------------------|
| 3 | < 1 % |
| 2 | < 5 % |
| 1 | <10 % |

RESULT

| Chemical | Concentration weight % | I _P | Class | I _R | Class |
|---|------------------------|----------------|-------|----------------|-------|
| Sulfuric Acid (H ₂ SO ₄) | 30 | 0% | 3 | 87 % | 2 |
| Sodium Hydroxide (NaOH) | 10 | 0% | 3 | 98.6% | 3 |
| o-Xylene | Undiluted | 0% | 3 | 91.2 % | 3 |

I_P: index of penetration

I_R: index of repellency

I_A: index of absorbtion

TEST RESULT

SEAM STRENGTH-GRAB METHOD

Clause 5.5 Seam Strength ISO 13935-2: 2014

Jaw Speed: 50±5 mm/min, Gauge Length: 100 mm±1 mm.

Seam Type : 301. 100 % Polyester core-spun sewing-thread was used.

5kN. Load was applied.

The average results are given for width and length direction of five samples.

Performed in the conditioned room(20±2°C-65%±4)

| | <u>Seam Strength (N)</u> | <u>Fail</u> | <u>CLASS</u> |
|---------------------------|--------------------------|-------------|--|
| Crotch | 60.3 N | FTS | - Classified according to the Table-13 |
| Side seam | 31.7 N | FTS | |
| Front center | 36.9 N | FTS | |
| Back center | 61.7 N | FTJ | |
| Waist | 36.2 N | FTS | |
| Sleeve seam | 83.7 N | FTS | |
| Hat | 74.9 N | FTS | |
| Zipper accessories | 52.4 N | - | |

FTS : Fabric Tear At The Seam

FTJ : Fabric Tear At The Jaw

Table 13- Classification of Seam Strength

| CLASS | Seam strength |
|--------------|----------------------|
| 6 | >500 N |
| 5 | >300 N |
| 4 | >125 N |
| 3 | >75 N |
| 2 | >50 N |
| 1 | >30 N |

AB-0583-T

20030009-
ing

09-20

TEST RESULT

PUNCTURE RESISTANCE

Clause 4.10.Puncture Resistance EN 863

RESULT

5.4 N

CLASS

1
Classified according to
the Table-6

Table-4 Classification of Puncture Resistance
(Tablo-6)

| <i>Class</i> | <i>Puncture Resistance</i> |
|--------------|----------------------------|
| 6 | >250 N |
| 5 | >150 N |
| 4 | >100 N |
| 3 | >50 N |
| 2 | >10 N |
| 1 | >5N |

DETERMINATION OF RESISTANCE TO DAMAGE BY FLEXING METHOD C (CRUMPLE/FLEX) (*)

Test Metot : ISO 7854 :1995 Rubber- or plastics-coated fabrics -Determination of resistance to damage by flexing Method C (Crumple /Flex Test) (*)Clause 4.5

Two test pieces were prepared each 220 mm long x 190 mm widht

After cycle has finished examine the damage of samples and classified

RESULT

>40 000cycles

CLASS

Class 5
Classified according to
the Table-2

No damage observed

Table 2-Classification of flex cracking resistance

| Class | Number of cycles |
|-------|------------------|
| 6 | > 100 000 |
| 5 | >40 000 |
| 4 | > 15 000 |
| 3 | > 5 000 |
| 2 | > 2 500 |
| 1 | > 1000 |

EKOTEKS LABORATUVAR ve GÖZETİM
HİZMETLERİ A.Ş.

AB-0583-T

20030009-
ing

09-20

TEST RESULTS

Test Method: ISO 22612: 2005 (Clothing for protection against infectious agents - Test method for resistance to dry microbial penetration)

Samples and containers are sterilized. Agar plates are placed in each container. Samples are placed aseptically in the apparatus. The covers are closed. After making a pot in the sample with the piston, the pistons are removed and 0.5 g ± 0.1 g are added to five samples from the powder contaminated with bacteria and the six to the non-contaminated powder. Then all openings are closed with a plastic bag. The device is operated to give 20,800 vibrations per minute. The test time is 30 minutes. After the test is over, all agar plates are incubated at 35 ° C for 24 hours.

| | |
|---|------------------------------------|
| Sample amount: | 6 pieces 20x20 cm ² |
| Mikroorganizm: | <i>Bacillus subtilis</i> ATCC 9372 |
| Bacterial concentration (cfu/ml): | 1x10 ⁸ |
| Incubation conditions: | 35°C / 24 hours |
| RESULTS | |
| Number of Populating Bacteria (cfu) | |
| 1 | 0 |
| 2 | 0 |
| 3 | 1 |
| 4 | 0 |
| 5 | 0 |
| 6 (Control) | 0 |
| Total | 1 |
| Logarithm | 0 |
| * EN 13795-1:2019 Surgical gowns and drapes - Requirements and test methods are evaluated according to Table-1. | |
| RESULT | |
| Result (cfu/g) | Expected Value |
| 1cfu/g | ≤300 cfu/g |

Gen. fl136-2/03

**EKOTEKS LABORATUVAR ve GÖZETİM
HİZMETLERİ A.Ş.**

| |
|------------------|
| AB-0583-T |
| 20030009- ing |
| 09-20 |

TEST RESULTS

Test Method: BS EN 22610: 2006 (Surgical drapes, garments and fresh air clothes used as medical devices for patients, hospital staff and equipment - Test method for determination of resistance to wet bacterial permeability)

A test sample is placed on the agar plate on a rotating disc. Bacteria carrier material and coating film are placed on the test sample and all parts are fixed on the disk. A finger is placed on the test sample to apply a certain force ($3N \pm 0.02$). The finger moves on the test sample over the entire surface of the agar within 15 minutes. 5 studies are carried out for 15 minutes. 6. The study is repeated by inverting the sample.

| | |
|-------------------------------------|--|
| Sample amount: | 5 pieces 25x25cm2 |
| Carrier Material: | 30 µm thin, 25x25cm2 Polyurethane Film |
| Coating Material: | 25x25cm2 HDPE Film |
| Microorganism: | Staphylococcus aureus ATCC 29213 |
| Bacterial Concentration (kob / ml): | 1-4x104 kob / ml |
| Incubation Conditions: | (36 ± 1) ° C 48 hours |

RESULTS

| Breakthrough time, <i>t</i> min | Number of Populating Bacteria (cfu) | | Penetration Rate | |
|------------------------------------|--|-----|------------------|-----|
| 15 | X_1 | 0 | R_{CUM1} | 0 |
| 30 | X_2 | 0 | R_{CUM2} | 0 |
| 45 | X_3 | 0 | R_{CUM3} | 0 |
| 60 | X_4 | 0 | R_{CUM4} | 0 |
| 75 | X_5 | 0 | R_{CUM5} | 0 |
| | Z | 192 | | |
| | T | | | 192 |

X1 X5: Number of colonies growing in 5 parallel petri in the same sample

Z: number of colonies growing in the sixth petri dish

T: $X_1 + X_2 + X_3 + X_4 + X_5 + Z$

$RCUM1 = X_1/T$

$RCUM2 = (X_2 + X_1)/T$

$RCUM3 = (X_3 + X_2 + X_1)/T$

$RCUM4 = (X_4 + X_3 + X_2 + X_1)/T$

$RCUM5 = (X_5 + X_4 + X_3 + X_2 + X_1)/T$

EVALUATION

| Result | Class (*) |
|----------|-----------|
| $t > 75$ | 6 |

(*) BS EN 14126:2003 Protective Clothing —Performance requirements and tests methods for protective clothing against infective agents

| Class | Breakthrough time, <i>t</i> min |
|-------|------------------------------------|
| 6 | $t > 75$ |
| 5 | $60 < t \leq 75$ |
| 4 | $45 < t \leq 60$ |
| 3 | $30 < t \leq 45$ |
| 2 | $15 < t \leq 30$ |
| 1 | ≤ 15 min |

EKOTEKS LABORATUVAR ve GÖZETİM
HİZMETLERİ A.Ş.

AB-0583-T

20030009-
ing

09-20

TEST RESULTS

DETERMINATION OF THE RESISTANCE TO PENETRATION BY BLOOD AND BODY FLUIDS-USING SYNTHETIC BLOOD; ISO 16603:2004

Textest, FX 3000-IV model + External Blood Cell

Test samples were conditioned at $60 \pm 10\%$ relative humidity and $21 \pm 5^\circ \text{C}$ for at least 24 hours before testing.

Test Procedure Applied:

C procedure

| Pressure (kPa) | Time (Min.) | Test Result | | | Overall Result |
|---|-------------|-------------|--------|--------|----------------|
| | | Test 1 | Test 2 | Test 3 | |
| 0 | 5 | Pass | Pass | Pass | PASS |
| 1,75 | 5 | Pass | Pass | Pass | |
| 3,5 | 5 | Pass | Pass | Pass | |
| 7 | 5 | Pass | Pass | Pass | |
| 14 | 5 | Pass | Pass | Pass | |
| 20 | 5 | Pass | Pass | Pass | |
| The time of failure (sn) | | - | - | - | - |
| Thickness of material tested (mm): | | 0.23 | 0.23 | 0.23 | 0.23 |
| Weight of material tested (g/m^2): | | 0.28 | 0.28 | 0.28 | 0.28 |

Gen.fl136-2/03