



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

20015024-
Ing-Add2

07-20

TEST REPORT
DENEY RAPORU

Customer name: UNIVERSAL SERTİFİKASYON VE GÖZETİM HİZMETLERİ TİCARET LTD.ŞTİ.
Address: 15 Temmuz Mah. Gülbahar Cad. No:96 Bağcılar/İSTANBUL
Buyer name: ÇAM KON FEKSİYON VE SANAYİ TİC.LİMİTED ŞİRKETİ
Contact Person: SUAT KAÇMAZ
Order No:
Article No:
Name and identity of test item: White protective overalls
The date of receipt of test item: 12.05.2020
Re-submitted/re-confirmation date: -
Date of test: 12.05.2020-06.07.2020
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: 9



Date
06.07.2020

Customer Representative
Serim YURTSEREN

Head of Testing Laboratory
Sevim A. RAZAK

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REQUIRED TESTS	RESULT	COMMENTS
PHYSICAL PROPERTIES TESTS		
Abrasion	-	Class 4
Water Permeability	-	Class 4
Tear Strength	-	Class 2
Tensile Strength	-	Class 1
Seam Strength	-	Class 1
Surface Resistivity ⁽¹⁾	F	
Puncture Resistance	-	Class 2
Repellency to Liquids	F	
Resistance To Penetration By Liquids	-	Class 1
Determination of resistance to damage by flexing ⁽²⁾		Class 5
MICROBIOLOGICAL TESTS		
Wet-Bacterial Penetration	-	Class 4
P: Pass F: Fail R: Refer to retailer technologist Tests were classified according to BS EN 14325:2018 ⁽¹⁾ Requirement was given by the vendor. ⁽²⁾ This report was reissued to add this test result		

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.



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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 ASSEMLAGES (*)

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 @400 revs

CLASS

4

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 811:2018

Hydrostatic Head Tester, Textest marka Fx 3000 model

Temperature of water10.°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
Average

RESULT

399.8 mm SS
232.5 mm SS
378.4 mm SS
402.9 mm SS
585.5 mm SS
399.8 mm SS

REQUIREMENT

>200 mmSS

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
33.3 N

CLASS
2

Classified according to
the Table-4

Length 67.1 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 Strenght 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
30.9 N

CLASS
1

Classified according to
the Table-5

Length 81.2 N

Table-4 Classification of Tensile Strenght

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

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	58.3	FTS	1 Classified according to the Table-13
Inner side seam	71.3	FTJ	
Front center seam	64.0	FTJ	
Back center seam	49.1	FTJ	
Waist	79.7	FTJ	
Sleeve	94.8	FTJ	
Hat	57.7	FTS	
Zipper handle	57.2	-	

FTS : Fabric Tear At The Seam

Table 13- Classification of Seam Strength

<u>CLASS</u>	<u>Seam strength</u>
6	>500 N
5	>300 N
4	>125 N
3	>75 N
2	>50 N
1	>30 N

TEST RESULT

SURFACE RESISTIVITY; EN 1149-1:2006(*)

Ohm meter (METRISO 3000) and ring probe were used.

Original sample was tested as the client's request

Pre-Treatment -

Atmosphere for conditioning and testing (23± 1)°C, (25± 5)%RH

Conditioning time ≥ 24 hours

Applied voltage -

Number of samples tested 5

RESULT		
Measurement	Surface Resistivity	REQUIREMENT
Geometrical Mean	1.20 x 10 ¹² Ω	<2.5 x 10 ⁹ Ω

TEST RESULT

PUNCTURE RESISTANCE

Clause 4.10.Puncture Resistance EN 863 (*)

RESULT

17.3 N

CLASS

2

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

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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 width

After cycle has finished examine the damage of samples and classified

RESULT

>40 .000 cycles

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

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

Width

Chemical	Concentration weight %	I _P	Class	I _R	Class
Sulfuric Acid (H ₂ SO ₄)	30	<%1	3	>%90	3
Sodium Hydroxide (NaOH)	10	<%1	3	<%70	-
o-Xylene	Undiluted	<%10	1	>%70	1

Length

Chemical	Concentration weight %	I _P	Class	I _R	Class
Sulfuric Acid (H ₂ SO ₄)	30	<%1	3	>%90	3
Sodium Hydroxide (NaOH)	10	<%1	3	<%70	-
o-Xylene	Undiluted	<%10	1	>%70	1

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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 25x25cm ²
Carrier Material:	30 µm thin, 25x25cm ² Polyurethane Film
Coating Material:	25x25cm ² HDPE Film
Microorganism:	Staphylococcus aureus ATCC 29213
Bacterial Concentration (kob / ml):	1-4x10 ⁴ kob / ml
Incubation Conditions:	(36 ± 1) ° C 48 hours

RESULTS

Breakthrough time, t min	Number of Populating Bacteria (cfu)		Penetration Rate	
	15	X ₁	0	R _{CUM1}
30	X ₂	0	R _{CUM2}	0
45	X ₃	0	R _{CUM3}	0
60	X ₄	51	R _{CUM4}	0,31
75	X ₅	43	R _{CUM5}	0,58
	Z	67		
	T	161		

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: X1 + X2 + X3 + X4 + X5 + Z

RCUM1 = X1/T

RCUM2 = (X2 + X1)/T

RCUM3 = (X3 + X2 + X1)/T

RCUM4 = (X4 + X3 + X2 + X1)/T

RCUM5 = (X5 + X4 + X3 + X2 + X1)/T

EVALUATION

Result	Class (*)
45 < t ≤ 60	4

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

Class	Breakthrough time, t min
6	t > 75
5	60 < t ≤ 75
4	45 < t ≤ 60
3	30 < t ≤ 45
2	15 < t ≤ 30
1	≤ 15 min