

# TEST REPORT



- Client : Sol MA
- Address : 387, Hwahap-ro, Nam-myeon, Yangju-si, Gyeonggi-do, Korea
- Report NO. : 2020-0326-0501-C01
- Sample Received Date : March. 26. 2020.
- Test Started Date : March. 26. 2020. ~ April. 17. 2020.
- Report Issued Date : April. 17. 2020.

○ Sample Description : -

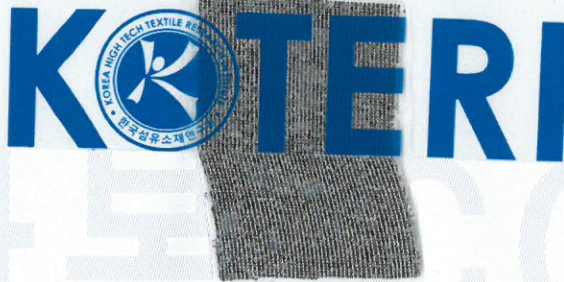
- Buyer Name : -
- Use of Report : Presentation
- Sample name : #1: Antibacterial Mask fabric (child)

○ Testing Environment : Temperature ( 23 ± 3 ) °C , Humidity : ( 55 ± 10 ) % R.H.

○ Test Conducted : For details please see attached pages.

This report is not related to KOLAS recognition.

#1



Affirmation	Tested By	Authorized By
	Name : D. H Song (Signature)	Technology Manager Name : M. J Kim (Signature)

**KOREA High Tech Textile Research Institute**

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2. This Test Report cannot be reproduced, except in full.

**TEST CONDUCTED****RESULTS**

(1) Colour fastness to Laundering ( KS K ISO 105 - C06 : 2014, A1S, 30Minutes, 40°C, 0.4% Detergent, 10 Steel balls ) : GRADE

	#1
Colour Change	4-5
Colour Staining	
- Acetate	4-5
- Cotton	4-5
- Nylon	4-5
- Polyester	4-5
- Acrylic	4-5
- Wool	4-5

(2) Colour fastness to crocking ( KS K ISO 105 - X12 : 2016 ) : GRADE

	#1
Dry	4-5
Wet	4-5

(3) Color fastness to artificial light ( KS K ISO 105 - B02 : 2015, 20h ) : GRADE

#1  
4

(4) Color fastness to artificial light ( KS K 0701 : 2014, 20h ) : GRADE

	#1
Acidic	4
Alkali	4

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## TEST CONDUCTED

## RESULTS

(5) Dimensional Changes Washing ( KS K ISO 5077 : 2014, 27°C, 1 Cycles, Flat Dry ) : %

#1

Wales

0.1

Course

0.4

(6) Quantitative chemical analysis ( KS K 0210 : 2018, Melting ) : %

#1

Polyester

93.2

Polyurethane

6.8

(7) water repellency ( KS K ISO 4920 : 2014, spray test ) : GRADE

#1

4-5

(8) Air Transmittance ( KS K ISO 9237 : 2017, static pressure 100pa ) :  $\text{cm}^2/\text{cm}^2/\text{s}$

#1

25.5

(9) pH ( Supplier's Confirmation of Conformity Standards Part 15 5.2.1  
/ KS K ISO 3071 : 2005 )

#1

6.4

(Remark) 1. Extracting solution : KCl Solution

2. Instrument : pH meter

3. Standard : Children's Clothing, Underwear, Middle Layer Apparel (4.0 ~ 7.5)  
Outerwear, Bedding (4.0 ~ 9.0)

## TEST CONDUCTED

## RESULTS

(10) Formaldehyde ( Supplier's Confirmation of Conformity Standards Part 15 5.2.2  
/ KS K ISO 14184-1 : 2009 ) : mg/kg

#1

&lt; 20

- (Remark) 1. Detection Limit : 20.0 mg/kg  
2. Analysis instrument : UV-Vis  
3. Standard : 75.0 mg/kg

(11) Total Content of Nonylphenol ( Supplier's Confirmation of Conformity Standards Part 15 5.2.11  
/ ISO 18254-1 ) : mg/kg

#1

Nonylphenol(NP) < 3  
p-Nonylphenol-ethoxylate(NPEO) < 30

- (Remark) 1. Detection Limit : NP (3 mg/kg), NPEO (30 mg/kg)  
2. Analysis Instrument : LC-MS-MS  
3. Standard : ≤ 100.0 mg/kg

TEST CONDUCTED

RESULTS

(12) Arylamine ( Supplier's Confirmation of Conformity Standards Part 15 5.2.3  
 / KS K 0147 : 2015 ): mg/kg

	#1
1	biphenyl-4-ylamine (92-67-1) < 5
2	benzidine (92-87-5) < 5
3	4-chloro-o-toluidine (95-69-2) < 5
4	2-naphthylamine (91-59-8) < 5
5	o-aminoazotoluene (97-56-3) < 5
6	2-amino-4-nitrotoluene (99-55-8) < 5
7	4-chloroaniline (106-47-8) < 5
8	2,4-diaminoanisole (615-05-4) < 5
9	4,4'-diamino-diphenylmethane (101-77-9) < 5
10	3,3'-dichlorobenzidine (91-94-1) < 5
11	3,3'-dimethoxybenzidine (119-90-4) < 5
12	3,3'-dimethylbenzidine (119-93-7) < 5
13	4,4'-methylenedi-o-toluidine (838-88-0) < 5
14	p-cresidine (120-71-8) < 5
15	4,4'-methylene-bis-(2-chloroaniline) (101-14-4) < 5
16	4,4'-oxydianiline (101-80-4) < 5
17	4,4'-thiodianiline (139-65-1) < 5
18	o-toluidine (95-53-4) < 5
19	2,4-toluylenediamine (95-80-7) < 5
20	2,4,5-trimethylaniline (137-17-7) < 5
21	o-anisidine (90-04-0) < 5
22	4-aminoazobenzene (60-09-3) < 5
23	2,4-xylidine (95-68-1) < 5
24	2,6-xylidine (87-62-7) < 5

- (Remark) 1. Detection Limit : 5 mg/kg  
 2. Analysis instrument : GC-MS  
 3. Standard : ≤ 30 mg/kg

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TEST CONDUCTED

RESULTS

(13) Allergenic Disperse Dyestuffs ( Supplier's Confirmation of Conformity Standards Part 15 5.2.9 / KS K 0736 : 2014 ) : mg/kg

		#1
1	Disperse Blue 1 (2475-45-8)	< 20
2	Disperse Blue 3 (2475-46-9)	< 20
3	Disperse Blue 7 (3179-90-6)	< 20
4	Disperse Blue 26 (3860-63-7)	< 20
5	Disperse Blue 35 (12222-75-2)	< 20
6	Disperse Blue 102 (12222-97-8)	< 20
7	Disperse Blue 106 (12223-01-7)	< 20
8	Disperse Blue 124 (61951-51-7)	< 20
9	Disperse Brown 1 (23355-64-8)	< 20
10	Disperse Orange 1 (2581-69-3)	< 20
11	Disperse Orange 3 (730-40-5)	< 20
12	Disperse Orange 37/59/76 (13301-61-6)	< 20
13	Disperse Orange 149 (85136-74-9)	< 20
14	Disperse Red 1 (2872-52-8)	< 20
15	Disperse Red 11 (2872-48-2)	< 20
16	Disperse Red 17 (3179-89-3)	< 20
17	Disperse Yellow 1 (119-15-3)	< 20
18	Disperse Yellow 3 (2832-40-8)	< 20
19	Disperse Yellow 9 (6373-73-5)	< 20
20	Disperse Yellow 23 (6250-23-3)	< 20
21	Disperse Yellow 39 (12236-29-2)	< 20
22	Disperse Yellow 49 (54824-37-2)	< 20

- (Remark) 1. Detection Limit : 20 mg/kg  
 2. Analysis Instrument : LC-MS-MS  
 3. Standard : ≤ 50 mg/kg

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## TEST CONDUCTED

## RESULTS

(14) Antibacterial Test ( KS K 0693 : 2016 ) : %

#1

## Staphylococcus aureus

Ma	$1.0 \times 10^5$
Mb	$5.0 \times 10^6$
Mc	< 20
Bacteriostatic Activity Value	5.4
Bacteriostatic Reduction Value(%)	99.9

## Klebsiella pneumoniae

Ma	$1.2 \times 10^5$
Mb	$1.1 \times 10^7$
Mc	< 20
Bacteriostatic Activity Value	5.7
Bacteriostatic Reduction Value(%)	99.9

\* Test Organism : Staphylococcus aureus (ATCC 6538)  
Klebsiella pneumoniae (ATCC 4352)

## Washing

Used non-ionic surfactant : TWEEN 80 (0.05%)

Growth rate : Mb/Ma  $\geq$  31.6

Staphylococcus aureus : 45.5

Klebsiella pneumoniae : 91.7

Bacteriostatic Activity Value(S) :  $\log Mb - \log Mc$ Bacteriostatic Reduction Value(%) :  $(Mb - Mc) \times 100 / Mb$ 

Ma : CFU of 0 contact time in control

Mb : CFU of 18 hours later in control

Mc : CFU of 18 hours later in sample

※ The test results of Antibacterial Test : Please refer to the attached KOTITI (Korea Testing & Research Institute) for details

TEST CONDUCTED

RESULTS

#1

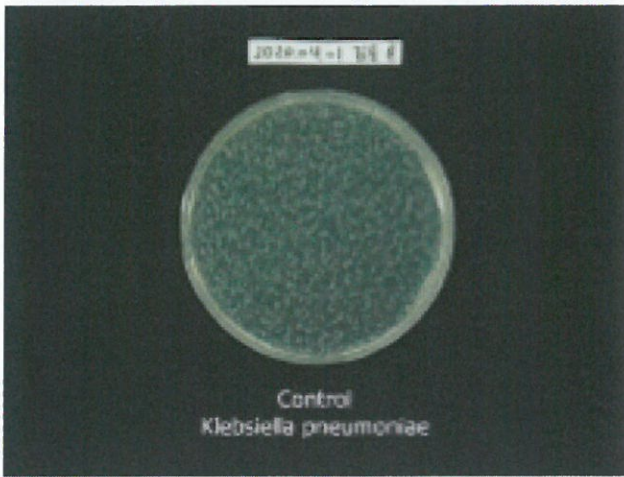
Contrast Bacteria (Staphylococcus Aureus)



Staphylococcus Aureus



Contrast Bacteria (Klebsiella Pneumoniae)



Klebsiella Pneumoniae



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TEST CONDUCTED

RESULTS

(15) Transmittance or Blocking of Ultraviolet Radiation ( KS K 0850 : 2014 ) : %

#1

UPF	1661.3
*UPF for Label	50+
T(UV-A) (%)	0.2
T(UV-B) (%)	0.1
UV-A (%)	99.8
UV-B (%)	99.9

\* Refer to Australian clothing standard (AS/NZS 4399 : 2017)

UPF	Effective UV transmission, less than or equal to	Classification
15	6.7%	Minimum
30	3.3%	Good
50, 50+	2.0%	Excellent

- \* T(UV-A) : The UV-A Transmittance (315-400nm)
- \* T(UV-B) : The UV-A Transmittance (290-315nm)
- \* T(UV-R) : The UV-A Transmittanc (290-400nm)
- \* UV-A : The Percent Blocking (315-400nm)
- \* UV-B : The Percent Blocking (290-315nm)
- \* UV-R : The Percent Blocking (290-400nm)

- \* Test condition : Illuminant : Pre-aligned Tungsten-halogen and Deuterium lamp
- \* Test Instriment : UV-VISIBLE-NIR Spectrophotometer (PerkinElmer Lambda 950)

※ The test results of Transmittance or Blocking of Ultraviolet Radiation : Please refer to the attached KOTITI (Korea Testing & Research Institute) for details

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