



CENTROCOT
Innovation experience



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LAB N° 0033 L

Test Report 21RA00732

of 19/02/2021

Samples and identifications

Sample 21LA01269

Receipt date: 18/01/2021

Sample receiving date: 21/12/2020

Description

Description: **Nonwoven disposable protective gown**

Article: **N303**

Color: **light blue**

Composition: **100% polypropylene + polyethylene film**

Mass per unit area: **40 g/m²**

Sampling carried out by: **customer**

Sample 21LA01269/01

Sample 21LA01269 - Nonwoven fabric

Sample 21LA01269/02

Sample 21LA01269 - Ultrasonic simple seam

This Test Report consists of the following results

- 90102 Protective clothing. Penetration by blood and body fluids. Synthetic blood method
- 90112 Protective clothing. Penetration by blood and other body fluids-born pathogens. Phi-X174 bacteriophage method
- 90123 Protective clothing. Wet bacterial penetration
- 90134 Protective clothing. Penetration by biologically contaminated aerosols
- 90135 Protective clothing. Penetration by biologically contaminated powders
- 90400 Protective clothing. Abrasion (Martindale)
- 90302 Protective clothing. Tearing strength. Trapezoid method
- 90521 Protective clothing. Resistance to damage by repeated flexing
- 90270 Protective clothing. Tensile Strength. Strip method
- 90541 Protective clothing. Perforation
- 90341 Protective clothing. Seam tensile properties. Grab method



Protective clothing. Penetration by blood and body fluids. Synthetic blood method

Product standard	UNI EN 14126:2004
Test method	ISO 16603:2004 + UNI EN 14126:2004 Par. 4.1.4.1
Test solution	Synthetic blood
Test equipment	Penetration test cell
Time and pressure protocol	Procedure D
Test time	5 min for each pressure tested
Specimens dimensions	(75x75) mm
Number of specimens	3
Specimens conditioning	24 h at (21 ± 5)°C - (60 ± 10)% U.R.
Pretreatment	No
Test began on:	15/02/2021
Test ended on:	15/02/2021

Results for sample 21LA01269/01

UM result

Sample 21LA01269 - Nonwoven fabric

Specimen n°1 0kPa	Pass
Specimen n°2 0kPa	Pass
Specimen n°3 0kPa	Pass
Specimen n°1 1.75kPa	Pass
Specimen n°2 1.75kPa	Pass
Specimen n°3 1.75kPa	Pass
Specimen n°1 3.5kPa	Pass
Specimen n°2 3.5kPa	Pass
Specimen n°3 3.5kPa	Pass
Specimen n°1 7kPa	Pass
Specimen n°2 7kPa	Pass
Specimen n°3 7kPa	Pass
Specimen n°1 14kPa	Pass
Specimen n°2 14kPa	Pass
Specimen n°3 14kPa	Pass
Specimen n°1 20kPa	Pass
Specimen n°2 20kPa	Pass
Specimen n°3 20kPa	Pass

Pass. The specimen resist to penetration and synthetic blood doesn't pass through the fabric.
Fail. The specimen doesn't resist to penetration and the synthetic blood pass through the fabric.

Protective clothing. Penetration by blood and other body fluids-born pathogens. Phi-X174 bacteriophage method

Product standard	UNI EN 14126:2004
Test method	ISO 16604:2004 + UNI EN 14126:2004 Par. 4.1.4.1
Test equipment	Penetration test cell
Name of test microorganism	Bacteriophage Phi-X 174 (ATCC 13706-B1 LOT: CNM 16415)
Specimens dimensions	(75x75) mm
Penetration survey method	Plaque-forming units (PFU)
Number of specimens	3
Procedure	Procedure D
Pretreatment	No
Test began on:	15/02/2021
Test ended on:	18/02/2021



Results for sample	21LA01269/01	*	UM	result
Sample 21LA01269 - Nonwoven fabric				
Pre-test bacteriophage titer			PFU/ml	3.0E+008
Post-test bacteriophage titer			PFU/ml	2.8E+008
Test pressure			kPa	20.0
1st specimen				Pass
2nd specimen				Pass
3rd specimen				Pass
Negative control (polyethylene 10 µm)				Pass
Positive control				Fail

Pass. The specimen resist to penetration and micro-organism used for test doesn't pass through the fabric.

Fail. The specimen doesn't resist to penetration and micro-organism used for test pass through the fabric.

The sample pass the test when the viral particles don't penetrate them through the sample to one determined pressure and doesn't come found plaques due to cell lysis.

All acceptance criteria was met.

Protective clothing. Wet bacterial penetration

Product standard	UNI EN 14126:2004	
Test method	UNI EN ISO 22610:2006 + UNI EN 14126:2004 Par. 4.1.4.2	
Specimens conditioning	24 h a (20 ± 2)°C e (65 ± 5)% U.R.	
Name of test microorganism	Staphylococcus aureus (ATCC 29213 LOT: DSM2569-0816)	
Culture medium	Nutrient agar (Oxoid LOT. 2962018)	
Donor material	Polyurethanic membrane; thick 30 µm	
Testing time	5 steps of 15 minutes	
Pretreatment	No	
Test began on:	15/02/2021	Test ended on: 18/02/2021



Results for sample **21LA01269/01**

UM

result

Sample **21LA01269 - Nonwoven fabric**

Break through time

min

>75

Distanza media tra la superficie dell'agar ed il bordo delle piastre/ Distance from agar surface to brim of petri dish (mm): 3
Concentrazione della sospensione di prova (UFC/ml)/ Concentration of test suspension: $3.2 \cdot 10^4$

	Intervalli/ Interval (min)	n° colonie 1ª provetta/ n° colonies 1 st specimen	n° colonie 2ª provetta/ n° colonies 2 nd specimen	n° colonie 3ª provetta/ n° colonies 3 rd specimen	n° colonie 4ª provetta/ n° colonies 4 th specimen	n° colonie 5ª provetta/ n° colonies 5 th specimen	Media/ Average
Piastra 1/ Petri dish 1 (X1)	0-15	0	0	0	0	0	0
Piastra 2/ Petri dish 2 (X2)	15-30	0	0	0	0	0	0
Piastra 3/ Petri dish 3 (X3)	30-45	0	0	0	0	0	0
Piastra 4/ Petri dish 4 (X4)	45-60	0	0	0	0	0	0
Piastra 5/ Petri dish 5 (X5)	60-75	0	0	0	0	0	0
Piastra 6 (riferimento)/ Petri dish 6 (reference) (Z)		214	236	222	242	207	224
T		214	236	222	242	207	224
I _B (EPP)		6.0	6.0	6.0	6.0	6.0	6.0

Legenda

I_B (EPP) = indice di barriera

I_B (EPP) = $6 - (CUM1 + CUM2 + CUM3 + CUM4 + CUM5)$

dove:

CUM1 = X1/T

CUM2 = (X2 + X1)/T

CUM3 = (X3 + X2 + X1)/T

CUM4 = (X4 + X3 + X2 + X1)/T

CUM5 = (X5 + X4 + X3 + X2 + X1)/T

T = Z + X5 + X4 + X3 + X2 + X1

X1, X2, X3, X4 e X5: numero di colonie presenti sulle piastre da 1 a 5

Z = numero di colonie presenti sulla piastra n° 6 (riferimento)

Legend

I_B (EPP) = Barrier index

I_B (EPP) = $6 - (CUM1 + CUM2 + CUM3 + CUM4 + CUM5)$

where:

CUM1 = X1/T

CUM2 = (X2 + X1)/T

CUM3 = (X3 + X2 + X1)/T

CUM4 = (X4 + X3 + X2 + X1)/T

CUM5 = (X5 + X4 + X3 + X2 + X1)/T

T = Z + X5 + X4 + X3 + X2 + X1

X1, X2, X3, X4 e X5: number of colonies on the 5 plates in one replicate test

Z = number of colonies from the top side (plate n.6 reference)

Protective clothing. Penetration by biologically contaminated aerosols

Product standard	UNI EN 14126:2004
Test method	ISO/DIS 22611:2003 + UNI EN 14126:2004 Par. 4.1.4.3
Culture medium	Nutrient agar (Oxoid LOT. 2962018)
Name of test microorganism	Staphylococcus aureus (ATCC 6538 LOT: DSM 799-0415)
Test equipment	Perspex box with Collision atomizer
Specimens dimensions	Diameter 25 mm
Number of specimens	4
Pretreatment	No
Test began on:	15/02/2021
Test ended on:	17/02/2021



Results for sample	21LA01269/01	*	UM	result
Sample 21LA01269 - Nonwoven fabric				
Micro-organisms extract to membrane REFERENCE (Value A)				
1st specimen			CFU	2.7E+003
2nd specimen			CFU	2.6E+003
3rd specimen			CFU	2.5E+003
4th specimen			CFU	2.8E+003
Average (A)			CFU	2.7E+003
Micro-organisms extract to membrane specimen (Value B)				
1st specimen			CFU	0
2nd specimen			CFU	0
3rd specimen			CFU	0
4th specimen			CFU	0
Average (B)			CFU	0.0
Penetration ratio (A/B)			Log10 CFU	>5

Protective clothing. Penetration by biologically contaminated powders

Product standard	UNI EN 14126:2004
Test method	UNI EN ISO 22612:2005 + EC1-2011 + UNI EN 14126:2004 Par. 4.1.4.4
Name of test microorganism	Spores of Bacillus subtilis (ATCC 9372 LOT: Simicon 7 SU 10817/9-9)
Culture medium	TGE agar (Oxoid LOT. 1998611)
Test equipment	Vibrating apparatus
Number of specimens	10
Specimens dimensions	(200x200) mm
Test time	30 minutes
Pretreatment	No
Test began on:	16/02/2021
Test ended on:	18/02/2021

Results for sample	21LA01269/01	UM	result
Sample 21LA01269 - Nonwoven fabric			
Talcum concentration		CFU/g	7.7E+007
1st specimen		CFU	0
2nd specimen		CFU	0
3rd specimen		CFU	0
4th specimen		CFU	0
5th specimen		CFU	0
6th specimen		CFU	0
7th specimen		CFU	0
8th specimen		CFU	0
9th specimen		CFU	0
10th specimen		CFU	0
Average		CFU	0.0
Penetration		Log10 CFU	<1



Protective clothing. Abrasion (Martindale)

Product standard	UNI EN 14126:2004
Test method	UNI EN 530:2010 Met. 2 + UNI EN 14325:2005 Par. 4.4.1 + UNI EN 14126:2004 Par. 4.1.2
Standard atmosphere for conditioning	(20±2)°C - (65±4)%R.H.
Test equipment	Martindale
Pressure on specimen	9 kPa
Abradant	abrasive paper 00
Type of felt used	wool
End test	1° hole
Number of measured specimens	4
Pretreatment	no
Test began on:	03/02/2021
Test ended on:	03/02/2021

Results for sample 21LA01269/01 **UM** **result**

Sample 21LA01269 - Nonwoven fabric

Number of rubbing effective in which it was observed the end of the test

1st specimen	rubblings	500
2nd specimen	rubblings	1000
3rd specimen	rubblings	1000
4th specimen	rubblings	1000
Lower value	rubblings	500

Protective clothing. Tearing strength. Trapezoid method

Product standard	UNI EN 14126:2004
Test method	UNI EN ISO 9073-4:1999 + UNI EN 14325:2005 Par. 4.7 + UNI EN 14126:2004 Par. 4.1.2
Standard atmosphere in normal conditioning	(20±2)°C - (65±4)%R.H.
Test equipment	Dynamometer type C.R.E.
Rate of extension	(100 ± 10) mm/min
Specimen dimension	(75 ± 1)x(150 ± 2) mm
Length test	(25 ± 1) mm
Useful length of tearing strength	(64 ± 1) mm
Tearing strength	Average of the peaks (sensitivity 0.1%)
Number of measured specimens	5 for direction
Number of discarded specimens	0
Test began on:	09/02/2021
Test ended on:	09/02/2021



Results for sample	21LA01269/01	UM	result
Sample 21LA01269 - Nonwoven fabric			
Tearing of the longitudinal direction			
1st specimen		N	41.1
2nd specimen		N	41.7
3rd specimen		N	54.3
4th specimen		N	46.3
5th specimen		N	55.2
Average		N	47.7
C.V. forces tearing		%	14.1
Tearing of the transversal direction			
1st specimen		N	24.8
2nd specimen		N	20.4
3rd specimen		N	21.5
4th specimen		N	20.1
5th specimen		N	20.9
Average		N	21.5
C.V. forces tearing		%	8.81

Protective clothing. Resistance to damage by repeated flexing

Product Standard	UNI EN 14126:2004
Test method	UNI EN ISO 7854:1999 Met. B + UNI EN 14325:2005 Par. 4.5 + UNI EN14126:2004 Par. 4.1.2
Standard atmosphere in normal conditioning	(20±2)°C - (65±4)%R.H.
Test equipment	Flexiometer
Stroke length of the mobile disk	(11.7 ± 0.35) mm
Mobile disk frequency	(8.3±0.4) Hz compression pulse per minute
Specimens dimensions	(105x50) mm
Number of cycles	100000
Number of measured specimens	3 for direction
Test began on:	29/01/2021
Test ended on:	29/01/2021

Results for sample	21LA01269/01	*	UM	result
Sample 21LA01269 - Nonwoven fabric				
Maximun longitudinal direction				
Lowest value after 100.000 cycles				2 - Null
Maximum transversal direction				
Lowest value after 100.000 cycles				2 - Null

Verification and description of the damage UNI EN ISO 7854:

- 0 Any deterioration
- 1 Light deterioration
- 2 Moderated deterioration
- 3 Important deterioration

Depth of the cracks UNI EN ISO 7854:

- "Null" Any cracks
- "A" Superficial cracks or of the layer of finish, not involving the alveolar or middle layer penetrating.
- "B" Penetrating cracks but that it dosen't cross the intermediary layer or, in the case of covering to an only layer, that dosen't expose the support of base.
- "C" Crossing cracks the support of base.
- "D" Cracks through the whole material.



Protective clothing. Tensile Strength. Strip method

Product standard	UNI EN 14126:2004
Test method	UNI EN ISO 13934-1:2013 + UNI EN 14325:2005 Par. 4.9 + UNI EN 14126:2004 Par. 4.1.2
Standard atmosphere in normal conditioning	(20 ± 2)°C - (65 ± 4)%U.R.
Rate of extension	(100±10) mm/min
Pretension applied	2 N
Width test	(50 ± 0.5) mm
Length test	(200±1) mm
Specimens conditions	conditioned
Number of measured specimens	5 for direction
Number of discarded specimens	0
Test began on:	09/02/2021
Test ended on:	09/02/2021

Results for sample 21LA01269/01

	UM	result
Sample 21LA01269 - Nonwoven fabric		
Longitudinal direction		
1st specimen	N	61.4
2nd specimen	N	67.5
3rd specimen	N	70.6
4th specimen	N	69.7
5th specimen	N	60.6
Average	N	66
Maximum elongation (average)	%	74.5
C.V. of the breaking force	%	7.1
C.V. of elongation	%	18.5
Transversal direction		
1st specimen	N	43.0
2nd specimen	N	44.1
3rd specimen	N	44.4
4th specimen	N	43.1
5th specimen	N	43.9
Average	N	44
Maximum elongation (average)	%	70.5
C.V. of the breaking force	%	1.4
C.V. of elongation	%	4.9

Protective clothing. Perforation

Product standard	UNI EN 14126:2004
Test method	UNI EN 863:1997 + UNI EN 14325:2005 Par. 4.10 + UNI EN 14126:2004 Par. 4.1.2
Specimens conditioning	24 h to (20 ± 2)°C - (65 ± 4)% U.R.
Test conditions	(20 ± 2)°C - (65 ± 4)%U.R.
Test apparatus	Dynamometer
Rate of extension	100 mm/min
Test began on:	09/02/2021
Test ended on:	09/02/2021



Results for sample 21LA01269/01 **UM** **result**

Sample 21LA01269 - Nonwoven fabric

Puncture resistance

1st specimen	N	6.89
2nd specimen	N	5.79
3rd specimen	N	6.95
4th specimen	N	7.73
Average	N	6.84
Lower value	N	5.79

Protective clothing. Seam tensile properties. Grab method

Product standard	UNI EN 14126:2004
Test method	UNI EN ISO 13935-2:2014 + UNI EN 14325:2005 Par. 5.5 + UNI EN 14126:2004 Par. 4.1.2
Standard atmosphere in normal conditioning	(20 ± 2)°C - (65 ± 4)%U.R.
Rate of extension	(50 ± 10) mm/min
Lenght test	(100 ± 1) mm
Specimen dimension	(100x350) mm
Seams ready done	yes
Number of measured specimens	3
Number of discarded specimens	0
Test began on:	09/02/2021
Test ended on:	09/02/2021

Results for sample 21LA01269/02 **UM** **result**

Sample 21LA01269 - Ultrasonic simple seam

Maximum force

1st specimen	N	51.1 c
2nd specimen	N	42.2 c
3rd specimen	N	37.5 c
Average	N	44

a= fabric tear
b= fabric tear at the jaws
c= fabric tear at the seam
d= breakage of sewing threads
e= thread pull-out
f= any combination of these

(*): no accredited by Accredia

Sampling carried out by customer: results refer to the sample as received; data and information indicated in the description field are given by customer for which it will be responsible

Issue date
19/02/2021

Microbiological Laboratory Manager
dott. Giovanni Tanchis

End of Test Report **21RA00732**