TEST REPORT

2021CN0775

DATE OF RECEPTION
23/08/2021

DATE TESTS
Starting: 24/08/2021
Ending: 04/10/2021

APPLICANT

KUNSHAN SUNSHINETEX NEW MATERIAL CO. LTD.
No. 417 Sanxiang Road
CN-215300 Kunshan
JIANGSU

IDENTIFICATION AND DESCRIPTION OF SAMPLES

REFERENCES
FABRIC REF.- POBFC3DY

According to information supplied by the customer:

Fabric reference: POBFC3DY
Composition and percentaje: 98% Polyester and 2% Carbon
Color: Nav y/ Fluo Yellow / Fluo Orange

TESTS CARRIED OUT

- PHOTOGRAPHY.
- PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING..
- DETERMINATION OF DIMENSIONAL CHANGE IN DOMESTIC WASHING AND DRYING.
- DETERMINATION OF BREAKING STRENGTH AND ELONGATION.
- DETERMINATION OF TEAR RESISTANCE.
- WATER VAPOUR RESISTANCE.
- WATER PENETRATION RESISTANCE. TEST UNDER HYDROSTATIC PRESSURE.
- DETERMINATION OF FLEX CRACKING AND CRACK GROWTH.
- PRE-TREATMENT*.

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*Tests marked with * are not included within the scope of the ENAC accreditation*

ENSAYOS Nº12 / LE025 Nº12 / LE427

Asociación de Investigación de la Industria Textil – C.I.F.: G03182870

RESULTS

PHOTOGRAPHY



Reference

FABRIC Ref.- POBFC3DY

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RESULTS

PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING

Standard
ISO 6330:2012

Standard deviation

Reference
Sample1 FABRIC Ref.- POBFC3DY

Units 1
Equipment Wascator 13471E05
Dryer machine JAMES HEAL 13473E05

Washing procedure 4N **Washing cycles** 5

Drying procedure
F (tumble dryer)

Washing powder
ECE detergent 98 + sodium perborate + TAED

Units	Dry mass of the samples	Counterweight mass	Equipment
1	0,94 Kg	1,00 Kg of Polyester	Wascator 13471E05

Start and finish date
30/08/2021 - 31/08/2021

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RESULTS

PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING

Standard
ISO 6330:2012

Standard deviation

Reference
Sample1 FABRIC Ref.- POBFC3DY

Units 1
Equipment Wascator 13471E05
Dryer machine JAMES HEAL 13473E05

Washing procedure 4N **Washing cycles** 5

Drying procedure
F (tumble dryer)

Washing powder
ECE detergent 98 + sodium perborate + TAED

Units	Dry mass of the samples	Counterweight mass	Equipment
1	0,41 Kg	1,59 Kg of Polyester	Wascator 13471E05

Start and finish date
30/08/2021 - 31/08/2021

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RESULTS

PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING

Standard
ISO 6330:2012

Standard deviation

Reference
Sample1 FABRIC Ref.- POBFC3DY

Units 1
Equipment Wascator 13470E05
Dryer machine JAMES HEAL 13472E05

Washing procedure 4N **Washing cycles** 5

Drying procedure
F (tumble dryer)

Washing powder
ECE detergent 98 + sodium perborate + TAED

Units	Dry mass of the samples	Counterweight mass	Equipment
1	0,46 Kg	1,54 Kg of Polyester	Wascator 13470E05

Start and finish date
27/08/2021 - 30/08/2021

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RESULTS

DETERMINATION OF DIMENSIONAL CHANGE IN DOMESTIC WASHING AND DRYING

Standard
EN ISO 5077:2008

Standard deviation

Preparation, marking and measuring of fabric specimens according to EN ISO 3759:2011
Starting test date 26/08/2021 **Ending test date** 06/09/2021

Washing procedure
4N (T^a = 40 ± 3ºC; Total dry load test samples and the counterweight 2 ± 0.1 Kg) according to ISO 6330:2012

Used apparatus
Wascator type A-Horizontal drum, front loading (13471E05)

Detergent
98 ECE reference detergent without optical brightener.

Counterweight
Type III - 100% polyester

Number of washing cycles
5

Dryer type
A3

Procedure F – Tumble dry(13473E05)

Uncertainty of test (% of the measured value)
± 0.5 %

Tested material
Fluorescent orange woven laminated fabric

Reference	Specimen	Direction	Dimensional change (%)
FABRIC Ref.- POBFC3DY	1	Warp	-0,5
		Weft	0,0

REMARK
Negative dimensional change indicates shrinkage
Positive dimensional change indicates lengthening

REQUISITE
In accordance with the Standard EN 343:2019, the dimensional change shall not exceed ± 3%, both in width warp and in length weft.

PASS

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RESULTS

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

Standard
EN ISO 1421:2016

Apparatus
INSTRON Dynamometer

Conditioning date	26/08/2021	**Test date**	04/10/2021

Atmosphere for conditioning testing

Temperature	(20±2) ºC	**Relative humidity**	65±5

Nº of specimens

Tested	5 for each direction	**Rejected**	0

Gauge length

Lengthwise	200 mm	**Crosswise**	200 mm

Test velocity

100 mm/min	100 mm/min

Mounting Laxo

State of the specimens
Conditioned

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RESULTS

Reference

FABRIC Ref.- POBFC3DY

Direction	Maximum average load (N)	C.V. (%)	Average elongation (%)	C.V. (%)
L	1258,5 1214,9 1259,7 1233,7 1176,6 1258,7	3	26,8 27,2 30,3 28 26,3 29,2	6,1

Direction	Maximum average load (N)	C.V. (%)	Average elongation (%)	C.V. (%)
T	848,9 1039,3 1052,5 996,1 1027,4 1012,2	8,4	28,1 29,6 30,2 30,3 30,5 32,9	5,7

Remark

The test procedure described in the two versions of the Standard (EN ISO 1421:1998 and EN ISO 1421:2016) is the same.

REQUISITE ACCORDING TO STANDARD EN 343:2019

The material must resist a breaking load in both directions ≥ 450 N.For materials with an elongation of more than 50% this requirement is not applicable.

PASS

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RESULTS

DETERMINATION OF TEAR RESISTANCE

Standard
EN ISO 4674-1:2016

Test procedure
Method A

Apparatus
INSTRON Dynamometer

Conditioning date 26/09/2021 **Test date** 04/10/2021

Atmosphere for conditioning testing
Temperature (20±2) ºC **Relative humidity** (65±5) %

Nº of specimens
Tested 5 for each direction **Rejected** 0

State of the specimens
Conditioned

Reference
FABRIC Ref.- POBFC3DY

Tear	Average load (N)	C.V. (%)
Lengthwise	110 120 110 110 120 110	4.3
Crosswise	110 110 120 120 120 120	5.4

Remark
The relative expanded uncertainty of Tear resistance is ±7% assay value of the measured, for a probability of coverage of 95%.
The test procedure described in the two versions of the Standard (EN ISO 4674:2003 and EN ISO 4674:2016) is the same.

REQUISITE ACCORDING TO STANDARD EN 343:2019
The external material must resist a determination of tear resistance in both directions ≥ 20 N.

PASS

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RESULTS

WATER VAPOUR RESISTANCE

Standard

EN ISO 11092:2014

Test date

04/10/2021

Uncertainty of the measurement

± 7% of the result for a coverage factor of K=2 (95%).

Observation or deviation from the Standard

Test atmosphere

Temperature	(35.0 ± 0.5) ºC
Relative humidity	(40 ± 3) %

Conditioning

Temperature	(35.0 ± 0.5) ºC
Relative humidity	(40 ± 3) %
Time	24 hours

Sample description

Orange laminated woven fabric.

Disposition test specimens

The inner face is in contact to the measurement surface.

Pre-treatment

RESULTS

Test results

Reference	Specimen	Water vapour resistance R_{et} (m^2Pa/W)
FABRIC Ref.- POBFC3DY	Specimen 1	26,05
	Specimen 2	25,38
	Specimen 3	25,23
	Average	**25,55**

According to the requirements of standard EN ISO 20471:2013+A1:2016 which refers to EN 343:2019, water vapour resistance of all layers of the garment shall be in accordance with the following table:

CLASS 1	CLASS 2	CLASS 3	CLASS 4
$40 < R_{et}$	$25 < R_{et} \leq 40$	$15 < R_{et} \leq 25$	$15 \geq R_{et}$

CLASE 3
CLASS 3

RESULTS

WATER PENETRATION RESISTANCE. TEST UNDER HYDROSTATIC PRESSURE

Standard
EN 20811:1992 (Obsolete)

Apparatus
Hydrostatic Head Tester

Conditioning date 02/09/2021 **Test date** 30/09/2021

Atmosphere for conditioning testing
Temperature (20±2) ºC **Relative humidity** (65±4) %

Water temperature
20 ºC

Rate of increase of water pressure
10cmH_2O/min ((980±50) Pa/min)
The test equipment applies the water pressure to the exposed surface from below.

Surface exposed
External side

Previous treatment
5 washing cycles at 40ºC, according to standard EN ISO 6330:2012, method 4N and type F drying (tumble dry)

Reference
FABRIC Ref.- POBFC3DY

Specimen	Pressure (cmH_2O)	Pressure (Pa)	Less Pressure
1	> 200	> 20000	> 20000
2	> 200	> 20000	
3	> 200	> 20000	
4	> 200	> 20000	

Remark
The edition of the standard used, does not correspond to the latest version released.

REQUISITE ACCORDING TO STANDARD 343:2019

	CLASS 1	CLASS 2	CLASS 3	CLASS 4
After pre-treatment	---	≥ 8000 Pa	≥ 13000 Pa	≥ 20000 Pa

CLASS 4

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RESULTS

WATER PENETRATION RESISTANCE. TEST UNDER HYDROSTATIC PRESSURE

Standard
EN 20811:1992 (Obsolete)

Apparatus
Hydrostatic Head Tester

Conditioning date 26/08/2021 **Test date** 09/09/2021

Atmosphere for conditioning testing
Temperature (20±2) ºC **Relative humidity** (65±4) %

Water temperature
20 ºC

Rate of increase of water pressure
10cmH_2O/min ((980±50) Pa/min)
The test equipment applies the water pressure to the exposed surface from below.

Surface exposed
External side

Abrasion Pre-treatment
According to standard EN 343:2019 punto 5.3

Reference
FABRIC Ref.- POBFC3DY

Specimen	Pressure (cmH_2O)	Pressure (Pa)	Less Pressure
1	> 200	> 20000	> 20000
2	> 200	> 20000	
3	> 200	> 20000	
4	> 200	> 20000	

Remark
The edition of the standard used, does not correspond to the latest version released.

REQUISITE ACCORDING TO STANDARD EN 343:2019

	CLASS 1	CLASS 2	CLASS 3	CLASS 4
After pre-treatment	---	≥ 8000 Pa	≥ 13000 Pa	≥ 20000 Pa

CLASS 4

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RESULTS

DETERMINATION OF FLEX CRACKING AND CRACK GROWTH

Standard
ISO 7854:1997

Test date
27/08/2021

Used apparatus
Crumpleflex equipment

Reference
FABRIC Ref.- POBFC3DY

Test performance

Specimens	Direction	Flex cycles
4	Warp and Weft	9000

Visual inspection after flex cycles

Material damage	No visible damage
Description of the damage	---
Cracking	No cracking
a. Depht of cracking b. Number of cracks c. Lenght of cracks	--- --- ---
Delamination	Doesn´t exist delamination

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RESULTS

WATER PENETRATION RESISTANCE. TEST UNDER HYDROSTATIC PRESSURE

Standard
EN 20811:1992 (Obsolete)

Apparatus
Hydrostatic Head Tester

Conditioning date 30/08/2021 **Test date** 30/09/2021

Atmosphere for conditioning testing
Temperature (20±2) ºC **Relative humidity** (65±4) %

Water temperature
20 ºC

Rate of increase of water pressure
10cmH_2O/min ((980±50) Pa/min)
The test equipment applies the water pressure to the exposed surface from below.

Surface exposed
External side

Pre-treatment Bending
According to standard EN ISO 7854:1997 Method C

Reference
FABRIC Ref.- POBFC3DY

Specimen	Pressure (cmH_2O)	Pressure (Pa)	Less Pressure
1	> 200	> 20000	> 20000
2	> 200	> 20000	
3	> 200	> 20000	
4	> 200	> 20000	

Remark
The edition of the standard used, does not correspond to the latest version released.

REQUISITE ACCORDING TO STANDARD EN 343:2019

	CLASS 1	CLASS 2	CLASS 3	CLASS 4
After pre-treatment	---	≥ 8000 Pa	≥ 13000 Pa	≥ 20000 Pa

CLASS 4

_____///

RESULTS

PRE-TREATMENT*

Reference
FABRIC Ref.- POBFC3DY

Test time
60 minutes

Used reactives
Oil, Fuel.

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RESULTS

WATER PENETRATION RESISTANCE. TEST UNDER HYDROSTATIC PRESSURE

Standard
EN 20811:1992 (Obsolete)

Apparatus
Hydrostatic Head Tester

Conditioning date 07/09/2021 **Test date** 22/09/2021

Atmosphere for conditioning testing
Temperature (20±2) ºC **Relative humidity** (65±4) %

Water temperature
20 ºC

Rate of increase of water pressure
10cmH_2O/min ((980±50) Pa/min)
The test equipment applies the water pressure to the exposed surface from below.

Surface exposed
External side

Pre-treatment with Fuel oil and Oils
According EN 343:2019 point 5.5

Reference
FABRIC Ref.- POBFC3DY

Specimen	Pressure (cmH_2O)	Pressure (Pa)	Less Pressure
Fuel	> 200	> 20000	> 20000
Fuel	> 200	> 20000	
Aceite	> 200	> 20000	
Aceite	> 200	> 20000	

Remark
The edition of the standard used, does not correspond to the latest version released.

REQUISITE ACCORDING TO STANDARD EN 343:2019

	CLASS 1	CLASS 2	CLASS 3	CLASS 4
After pre-treatment	---	≥ 8000 Pa	≥ 13000 Pa	≥ 20000 Pa

CLASS 4

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Lucia Martinez
Head of PPE and Ballistics department

Digitally signed by ISABEL LLOPIS LUMBRERAS - NIF:21678551Q
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