# TEST REPORT

**2021CN0699**

**DATE OF RECEPTION**
28/07/2021

**DATE TESTS**
Starting: 28/07/2021
Ending: 21/09/2021

**APPLICANT**

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

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

**IDENTIFICATION AND DESCRIPTION OF SAMPLES**

| REFERENCES |
|---|
| FABRIC POBFC3DY-1 |

According to information supplied by the customer:

Fabric reference: POBFC3DY-1
Composition and percentage: 98% Polyester and 2% Carbon and 60% Protex and 40% Cotton
Color: 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.
- DETERMINATION OF COORDINATES (X,Y,Y).
- COLOUR FASTNESS TO RUBBING.
- COLOUR FASTNESS TO PERSPIRATION.
- COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING.
- MEANING OF COLOUR FASTNESS APPRAISAL EVALUATED WITH GREY SCALE.



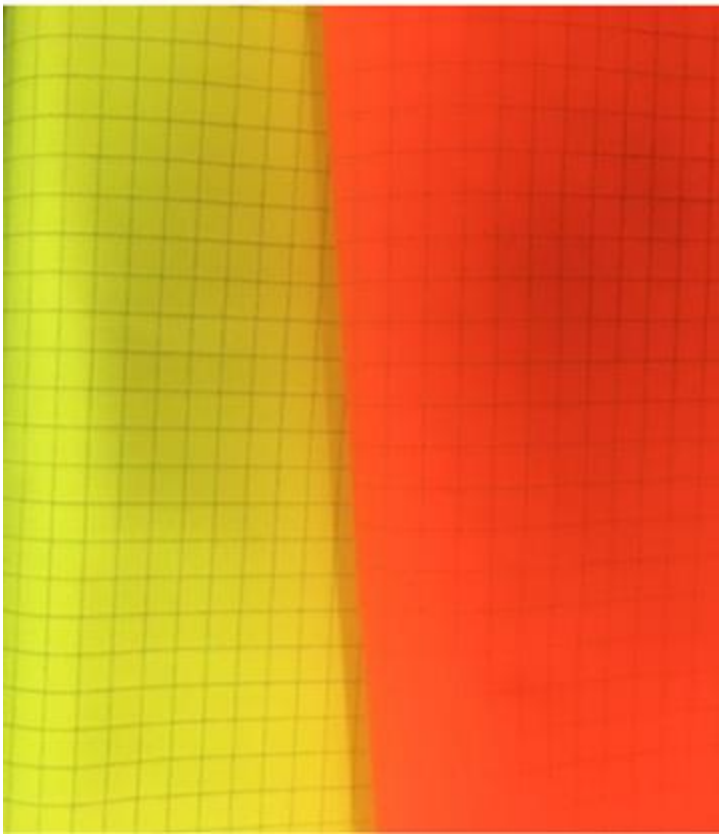
AITEX - Plaza Emilio Sala, 1 - E-03801 ALCOY (Alicante) SPAIN Tel.:+34 96 554 22 00 www.aitex.es info@aitex.es

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

ENAC ENSAYOS Nº12/LE025 Nº12/LE427

# RESULTS

## PHOTOGRAPHY



**Reference**

Fabric POBFC3DY-1

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# RESULTS

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

**Standard**
ISO 6330:2012

**Standard deviation**
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**Reference**
Sample1 Fabric POBFC3DY-1

| **Units** | 1 | 2 |
|---|---|---|
| **Equipment** | Wascator 13474E05 | Wascator 13151E12 |
| **Dryer machine** | JAMES HEAL 13475E05 | ELECTROLUX 13426E12 |

**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** | 0,950 Kg | 1,000 Polyester | Wascator 13474E05 |
| **2** | 1,911 Kg | | Wascator 13151E12 |

**Start and finish date**
11/08/2021 - 12/08/2021

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# RESULTS

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

**Standard**
ISO 6330:2012

**Standard deviation**
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**Reference**
Sample1 Fabric POBFC3DY-1

**Units** 1
**Equipment** Wascator 13370E12
**Dryer machine** ELECTROLUX 13426E12

**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 | 0,020 Kg | | 1,900 Kg of Polyester | Wascator 13370E12 |

**Start and finish date**
11/08/2021 - 12/08/2021

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# RESULTS

## DETERMINATION OF DIMENSIONAL CHANGE IN DOMESTIC WASHING AND DRYING

**Standard**
EN ISO 5077:2008

**Standard deviation**
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**Preparation, marking and measuring of fabric specimens according to EN ISO 3759:2011**
**Starting test date** 10/08/2021 **Ending test date** 18/08/2021

**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 (13474E05)

**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(13475E05)**

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

**Tested material**
Fluorescent orange woven fabric

| Reference | Specimen | Direction | Dimensional change (%) |
|---|---|---|---|
| **Fabric POBFC3DY-1** | 1 | Warp | -1,5 |
| | | Weft | -0,5 |

**REMARK**
Negative dimensional change indicates shrinkage
Positive dimensional change indicates lengthening

**REQUISITE**
In accordance with the Standard EN ISO 20471:2013/A1:2016, the dimensional change of knitted fabrics shall not exceed ±5%, both in width Crosswise and in length Lengthwise.

**PASS**

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# RESULTS

## DETERMINATION OF COORDINATES (x,y,Y)

**Standard**
EN ISO 105 J01:1999
Publication CIE 15

**Apparatus**
Konica Minolta ((0921E06) 400nm-700nm)

**Illuminant**
$D_{65}$

**Observant**
2º

**Measuring geometry**
45/0

**Specular component and UV filter**
Excluded

**Observation area**
Small

**Conditioning of samples**

| | | | |
|---|---|---|---|
| **Initiation date** | 10/08/2021 | **End date** | 26/08/2021 |
| **Temperature** | (20 ± 2) ºC | **Humidity** | (65 ± 5) % |

**Test date**

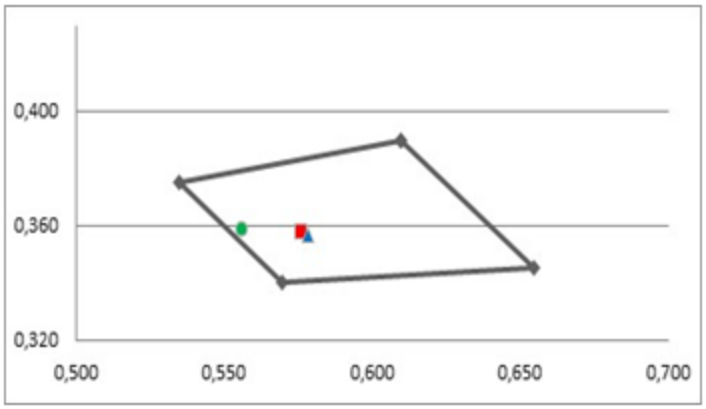
| | | | |
|---|---|---|---|
| **Initiation date** | 12/08/2021 | **End date** | 26/08/2021 |

**Number of measurements**
5

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# RESULTS

**Reference**
**Fabric POBFC3DY-1 (ORANGE FABRIC)**




| Reference | x | y | Y minimum |
|---|---|---|---|
| ♦ Coordinate 1 | 0,610 | 0,390 | 0,40 |
| ♦ Coordinate 2 | 0,535 | 0,375 | |
| ♦ Coordinate 3 | 0,570 | 0,340 | |
| ♦ Coordinate 4 | 0,655 | 0,345 | |
| ■ Fabric POBFC3DY-1 (Original) | 0,576 | 0,357 | 0,49 |
| ● Fabric POBFC3DY-1 (After exposure to Xenon light) | 0,556 | 0,359 | 0,54 |
| ▲ Fabric POBFC3DY-1 (After 5 washing cycles 4N + F) | 0,578 | 0,357 | 0,49 |
| Uncertainty | 0.4 % | 0.5 % | 1 % |

**REQUISITE**

The chromatic coordinates must be situated within the area defined by the coordinates specified in the Standard EN ISO 20471:2013/A1:2016 and the luminance factor shall exceed 0,40 specified in the Standard EN ISO 20471:2013/A1:2016.

**PASS**

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# RESULTS

## DETERMINATION OF COORDINATES (x,y,Y)

**Standard**
EN ISO 105 J01:1999
Publication CIE 15

**Apparatus**
Konica Minolta ((0921E06) 400nm-700nm)

**Illuminant**
$D_{65}$

**Observant**
2º

**Measuring geometry**
45/0

**Specular component and UV filter**
Excluded

**Observation area**
Small

**Conditioning of samples**

| | | | |
|---|---|---|---|
| **Initiation date** | 10/08/2021 | **End date** | 26/08/2021 |
| **Temperature** | (20 ± 2) ºC | **Humidity** | (65 ± 5) % |

**Test date**

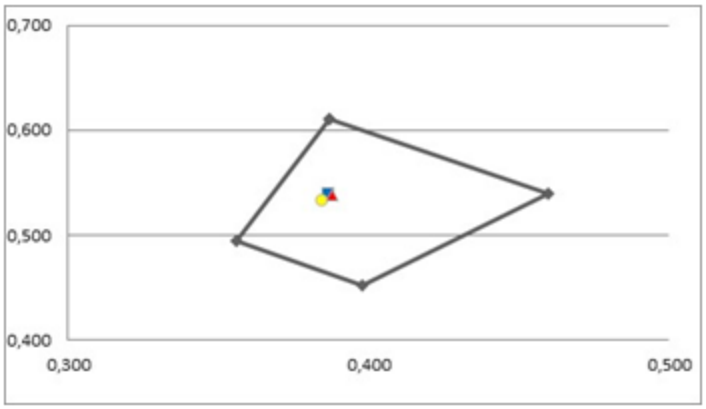
| | | | |
|---|---|---|---|
| **Initiation date** | 12/08/2021 | **End date** | 26/08/2021 |

**Number of measurements**
5

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# RESULTS

**Reference**
**Fabric POBFC3DY-1 (YELLOW FABRIC)**




| Reference | x | y | Y minimum |
|---|---|---|---|
| ♦ Coordinate 1 | 0,387 | 0,610 | 0,70 |
| ♦ Coordinate 2 | 0,356 | 0,494 | |
| ♦ Coordinate 3 | 0,398 | 0,452 | |
| ♦ Coordinate 4 | 0,460 | 0,540 | |
| ■ Fabric POBFC3DY-1 (YELLOW) (Original) | 0,387 | 0,538 | 0,11 |
| ● Fabric POBFC3DY-1 (YELLOW) (After exposure to Xenon light) | 0,385 | 0,533 | 1,03 |
| ▲ Fabric POBFC3DY-1 (YELLOW) (After 5 washing cycles 4N + F) | 0,388 | 0,538 | 1,07 |
| Uncertainty | 0.4 % | 0.5 % | 1 % |

**REQUISITE**

The chromatic coordinates must be situated within the area defined by the coordinates specified in the Standard EN ISO 20471:2013/A1:2016 and the luminance factor shall exceed 0,70 specified in the Standard EN ISO 20471:2013/A1:2016.

**PASS**

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# RESULTS

## COLOUR FASTNESS TO RUBBING

**Standard**
ISO 105-X12:2016

**Apparatus**
Crockmeter

**Starting test date**
10/08/2021

**Ending test date**
11/08/2021

**Conditioning time**
> 4 H

**Atmosphere for conditioning and testing**

| | |
|---|---|
| **Temperature** | (20±2) ºC |
| **Relative Humidity** | (65±2) %Hr |

**Pin**
Cylindrical

**Applied force**
(9 ± 0,2) N

| REFERENCE | DIRECTION | DRY STAINING |
|---|---|---|
| **Fabric POBFC3DY-1** YELLOW HV FABRIC | Warp | 4-5 |
| | Weft | 4-5 |
| **Fabric POBFC3DY-1** ORANGE HV FABRIC | Warp | 4-5 |
| | Weft | 4-5 |

**REQUISITE**
In accordance with Standard EN ISO 20471:2013/A1:2016, for colour fastness to rubbing, is 4, in dry rubbing.

**PASS**

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# RESULTS

## COLOUR FASTNESS TO PERSPIRATION

**Standard**
EN ISO 105-E04:2013

**Apparatus**
Perspirometer

**ALKALINE SOLUTION**
Aparatus Code 02022I04 (sweat basic)

| REFERENCE | Fabric POBFC3DY-1 YELLOW HV | |
|---|---|---|
| CHANGE IN COLOUR | STAINING | |
| 5 | Cotton | Polyester |
| | 4-5 | 4-5 |
| REFERENCE | Fabric POBFC3DY-1 ORANGE HV | |
| CHANGE IN COLOUR | STAINING | |
| 5 | Cotton | Polyester |
| | 4-5 | 4-5 |

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# RESULTS

**ACID SOLUTION**

Aparatus Code 02054I04 (sweat acid)

| | |
|---|---|
| **REFERENCE** | Fabric POBFC3DY-1<br>YELLOW HV |
| **CHANGE IN COLOUR** | **STAINING** |
| 5 | **Cotton** 4-5 **Polyester** 4-5 |
| **REFERENCE** | Fabric POBFC3DY-1<br>ORANGE HV |
| **CHANGE IN COLOUR** | **STAINING** |
| 5 | **Cotton** 4-5 **Polyester** 4-5 |

**REQUISITE**

In accordance with Standard EN ISO 20471:2013/A1:2016, for testing of colour fastness to perspiration, is 4 for degradation and 4 for staining

**PASS**

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# RESULTS

## COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING

**Standard**
EN ISO 105-C06:2010

**Apparatus**
Gyrowash

**Test number**
A1M

**Temperature**
40 ºC

**Steel balls**
10

**Detergent**
Standardized ECE soap reference without optical or chemical whitener

**Test piece drying in forced-air circulation dryer**

| REFERENCE | CHANGE IN COLOUR | STAINING | |
|---|---|---|---|
| Fabric POBFC3DY-1 YELLOW HV FABRIC | 5 | **Cotton** 4-5 | **Polyester** 4-5 |
| Fabric POBFC3DY-1 ORANGE HV FABRIC | 5 | **Cotton** 4-5 | **Polyester** 4-5 |

**REQUISITE**
The limit set by the Standard EN ISO 20471:2013/A1:2016 for testing of colour fastness to washing is 4-5 for degradation and 4 for staining.

**PASS**

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# RESULTS

## DETERMINATION OF BREAKING STRENGTH AND ELONGATION

**Standard**
EN ISO 1421:2016, Method 1

**Apparatus**
INSTRON Dynamometer

**Conditioning date** 10/08/2021 **Test date** 17/09/2021

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

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

**Gauge length**
200 mm

**Test velocity**
100 mm/min

**Mounting Laxo**

**State of the specimens**
Conditioned

Fabric POBFC3DY-1

| Direction | Maximum average load (N) | C.V. (%) | Average elongation (%) | C.V. (%) |
|---|---|---|---|---|
| Lengthwise | 689<br>767<br>824 773<br>833<br>749 | 8.0 | 15.0<br>17.0<br>18.0 17.0<br>18.0<br>16.0 | 7.0 |
| Crosswise | 602<br>647<br>711 665<br>700<br>662 | 7.0 | 20.0<br>21.0<br>22.0 21.0<br>22.0<br>21.0 | 5.0 |

**Remark**

The test procedure described in the two versions of the Standard (EN ISO 1421:1998 y EN ISO1421:2016) is the same

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# RESULTS

**REQUISITE ACCORDING TO STANDARD EN ISO 20471:2013/A1:2016**

The material must resist a breaking load in both directions ≥ 100 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** 10/08/2021 **Test date** 06/09/2021

**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 POBFC3DY-1

| Tear | Average load (N) | C.V. (%) |
|---|---|---|
| Warp | 64<br>64<br>57 62<br>60<br>64 | 5.4 |
| Weft | 55<br>46<br>48 49<br>51<br>45 | 8.7 |

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# RESULTS

**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 ISO 20471:2013 POINT 5.5.3**

The external material must resist a determination of tear resistance in both directions ≥ 20 N.

**PASS**

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# RESULTS

**MEANING OF COLOUR FASTNESS APPRAISAL EVALUATED WITH GREY SCALE**

| VALUE | MEANING |
|---|---|
| 5 | VERY GOOD-EXCELLENT |
| 4 | GOOD |
| 3 | FAIR-MODERATE |
| 2 | POOR BEHAVIOUR |
| 1 | VERY POOR |

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**Lucia Martinez**
**Head of PPE and Ballistics department**

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Date: 2021.10.06 16:45:25 +02:00
Reason: Autorizado
Location: Alcoy

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