TEST REPORT

2024EP0649

DATE OF RECEPTION

Date Format: dd/MM/yyyy 08/02/2024

DATE OF TESTS

Starting : 12/02/2024

Ending: 29/02/2024

APPLICANT

XM TEXTILES POLSKA SP. Z O. O.
16 WOLNOŚCIOWA
PL-95-200 Pabianice

Poland

Att Irina Danilova

REFERENCE OF SAMPLES

Reference by AITEX	Reference by customer	AITEX sample description
2024EP0649-S01	UNITEC-240	Woven fabric

TESTS CARRIED OUT

- PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING
- PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING
- DETERMINATION OF COORDINATES (x,y,Y)
- COLOUR FASTNESS TO RUBBING
- COLOUR FASTNESS TO PERSPIRATION
- COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING
- DETERMINATION OF BREAKING STRENGTH AND ELONGATION
- DETERMINATION OF DIMENSIONAL CHANGE IN WASHING AND DRYING
- WATER VAPOUR RESISTANCE

Tests marked with * are not included within the scope of the acreditation.

DESCRIPTION OF SAMPLES

Reference by AITEX*:* 2024EP0649-S01

Reference by customer*:*

UNITEC-240

AITEX sample description*:*

Yellow woven fabric.

Information supplied by the customer

Fabric ref. UNITEC-240
Weight 240gsm
Color HV Yellow
Others (if any) 555

Composition provided by the customer*:*

65% Polyester/35% Cotton, , Twill 2/1

AITEX Subsamples	Subsample Description
2024EP0649-S01_P1	Woven fabric - AFTER WASH 5 cycles
2024EP0649-S01_P2	Woven fabric - AFTER XENON
2024EP0649-S01_P3	Woven fabric - AFTER WASH 25 cycles

EXECUTIVE SUMMARY

	Reference	Test/Standard	Result
EN ISO 20471:2013+EN ISO 20471:2013+AMD1: 2016	2024EP0649-S01	COLOUR FASTNESS TO RUBBING **EN ISO 105-X12:2016**	PASS
		COLOUR FASTNESS TO PERSPIRATION **EN ISO 105-E04:2013**	PASS
		COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING **EN ISO 105-C06:2010**	PASS
		DETERMINATION OF BREAKING STRENGTH AND ELONGATION **EN ISO 13934-1:2013**	PASS
		WATER VAPOUR RESISTANCE **EN ISO 11092:2014**	PASS
	2024EP0649-S01_P1	DETERMINATION OF COORDINATES (x,y,Y) **ISO 105-J01:1997**	PASS
		DETERMINATION OF DIMENSIONAL CHANGE IN WASHING AND DRYING **EN ISO 5077:2008**	PASS
	2024EP0649-S01+ 2024EP0649-S01_P2+ 2024EP0649-S01_P3	DETERMINATION OF COORDINATES (x,y,Y) **ISO 105-J01:1997**	PASS

REQUIREMENT SUMMARY

DETERMINATION OF COORDINATES (x,y,Y)

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The chromatic coordinates must be situated within the area defined by the coordinates specified in the Standard EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016 and the luminance factor shall exceed according to:

Colour	Minimum luminance factor
Yellow	0.70
Orange	0.40
Red	0.25

COLOUR FASTNESS TO RUBBING

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The limit set to Standard for colour fastness to rubbing, is 4, in dry rubbing

COLOUR FASTNESS TO PERSPIRATION

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The limit set to Standard for testing of colour fastness to perspiration, is 4 for degradation and 4 for staining

COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The limit set to Standard for testing of colour fastness to washing is 4-5 for degradation and 4 for staining.

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The external material must resist a breaking load in both directions ≥ 100 N.

DETERMINATION OF DIMENSIONAL CHANGE IN WASHING AND DRYING

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

The dimensional change shall not exceed ± 3%, both in width warp and in length weft.

The dimensional change of knitted fabrics shall not exceed ±5%, both in width Crosswise and in length Lengthwise.

WATER VAPOUR RESISTANCE

REQUIREMENT ACCORDING EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016

According to requirement of EN ISO 20471:2013+EN ISO 20471:2013+AMD1:2016 standard, water vapour resistance shall not be higher than 5 $m^2 \cdot Pa/W$.

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

According to standards ISO 105-A02 e ISO 105-A03

RESULTS

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

Standard

EN ISO 6330:2021

Test date

Start date 12/02/2024 **End date** 13/02/2024

Washing procedure

6N

Washing temperature

60ºC

Washing cycles

5

Dryer type

James Heal

Drying procedure

F (type A1 tumble drying)

Drying temperature

70ºC

Washing powder

Reference detergent 3

Reference
2024EP0649-S01

Units	Dry mass of the samples(Kg)	Counterweight mass*(Kg)*	Counterweight type	Equipment
1	0.04	2	Type III	WASCATOR

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

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

Standard

EN ISO 6330:2021

Test date

Start date 12/02/2024 **End date** 14/02/2024

Washing procedure

6N

Washing temperature

60ºC

Washing cycles

25

Dryer type

James Heal

Drying procedure

F (type A1 tumble drying)

Drying temperature

70ºC

Washing powder

Reference detergent 3

Reference
2024EP0649-S01

Units	Dry mass of the samples(Kg)	Counterweight mass*(Kg)*	Counterweight type	Equipment
1	0.03	1.95	Type III	WASCATOR

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

DETERMINATION OF COORDINATES (x,y,Y)

Standard

ISO 105-J01:1997

Equipment

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

Test date

Start date	12/02/2024	**End date**	23/02/2024

Conditioned date

Start date	12/2/2024	**End date**	20/2/2024

Atmosphere for conditioning

Temperature	(20 ± 2) ºC	**Relative Humidity**	(65 ± 5) %

Iluminant

D_{65}

Observant

2º

Measuring geometry

45/0

Specular component and UV filter

Excluded

Observation area

Small

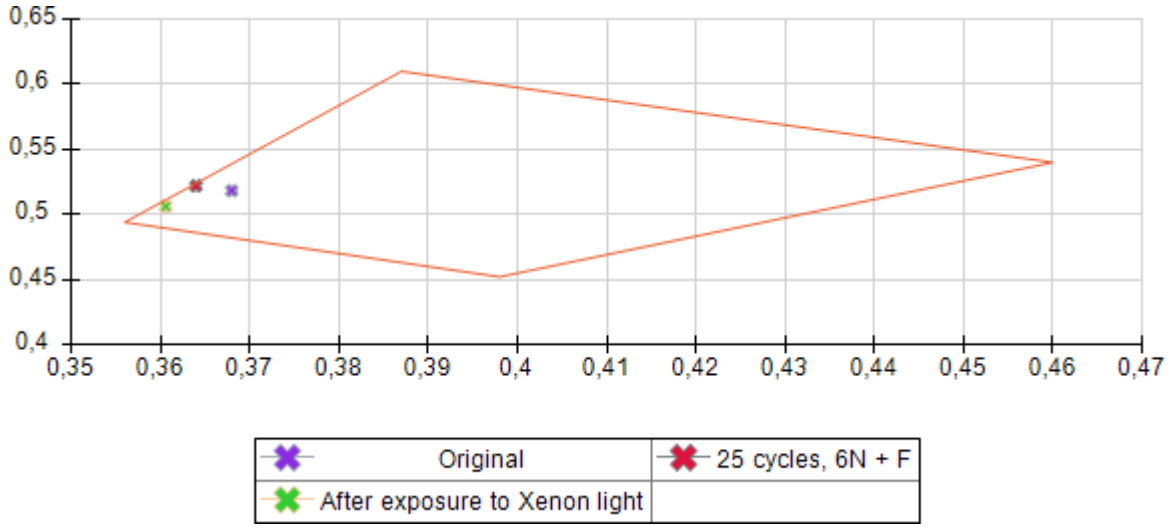
Number of measurements

5

Reference

2024EP0649-S01
2024EP0649-S01_P2
2024EP0649-S01_P3

	x	y	Y minimum
♦**Coordinate 1**	0,387	0,610	
♦**Coordinate 2**	0,356	0,494	0,70
♦**Coordinate 3**	0,398	0,452	
♦**Coordinate 4**	0,460	0,540	
Original	0,368	0,518	0,90
After exposure to Xenon light	0,361	0,506	0,90
After 25 washing cycles 6N + F	0,364	0,523	0,92
Uncertainty	± 0.4 %	± 0.5 %	± 1 %



The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240
2024EP0649-S01_P2	Woven fabric - AFTER XENON
2024EP0649-S01_P3	Woven fabric - AFTER WASH 25 cycles

RESULTS

DETERMINATION OF COORDINATES (x,y,Y)

Standard

ISO 105-J01:1997

Equipment

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

Test date

Start date	13/02/2024	**End date**	21/02/2024

Conditioned date

Start date	13/2/2024	**End date**	21/2/2024

Atmosphere for conditioning

Temperature	(20 ± 2) ºC	**Relative Humidity**	(65 ± 5) %

Iluminant

D_{65}

Observant

2º

Measuring geometry

45/0

Specular component and UV filter

Excluded

Observation area

Small

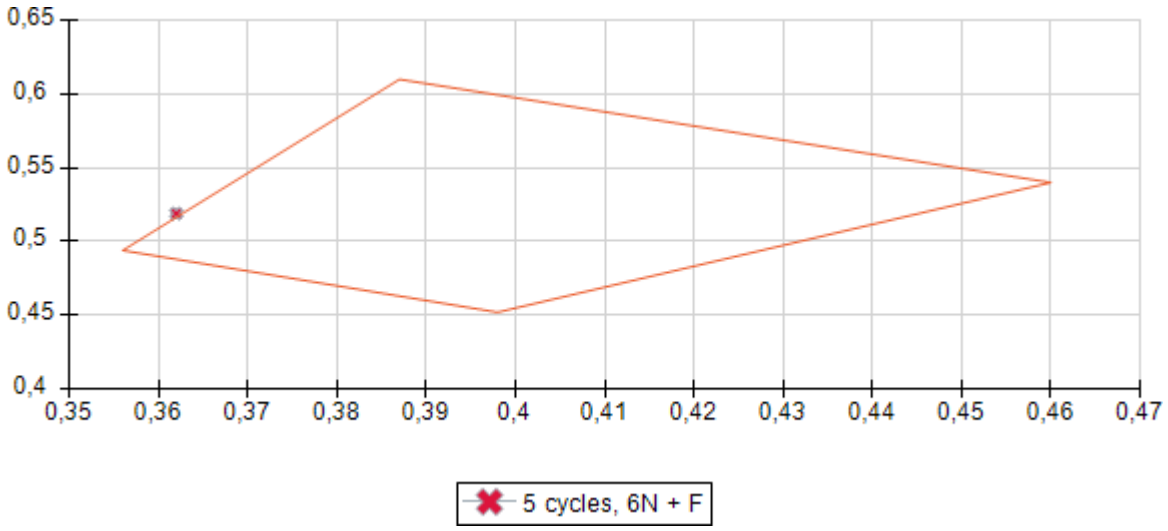
Number of measurements

5

Reference

2024EP0649-S01_P1

	x	y	Y minimum
♦**Coordinate 1**	0,387	0,610	
♦**Coordinate 2**	0,356	0,494	0,70
♦**Coordinate 3**	0,398	0,452	
♦**Coordinate 4**	0,460	0,540	
After 5 washing cycles 6N + F	0,362	0,519	0,92
Uncertainty	± 0.4 %	± 0.5 %	± 1 %



The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01_P1	Woven fabric - AFTER WASH 5 cycles

RESULTS

COLOUR FASTNESS TO RUBBING

Standard

EN ISO 105-X12:2016

Equipment

Crockmeter

Test date

Start date 12/02/2024 **End date** 15/02/2024

Atmosphere for conditioning

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

Conditioning time

> 4 H

Pin

Cylindrical

Applied force

(9 ± 0,2) N

Reference	Direction	Dry staining
2024EP0649-S01	Warp	5
	Weft	4-5

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

COLOUR FASTNESS TO PERSPIRATION

Standard

EN ISO 105-E04:2013

Equipment

Perspirometer

Test date

Start date 19/02/2024 **End date** 21/02/2024

Alkaline solution

Reference	Staining ratio		Change in colour
2024EP0649-S01	Cotton	Polyester	
	4-5	4-5	5

Acid Solution

Reference	Staining ratio		Change in colour
2024EP0649-S01	Cotton	Polyester	
	4-5	4-5	5

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

COLOUR FASTNESS TO DOMESTIC AND COMMERCIAL LAUNDERING

Standard

EN ISO 105-C06:2010

Test date

Start date 26/02/2024 **End date** 27/02/2024

Equipment

Gyrowash

Test number

C1M

Temperature

(60)ºC

Steel balls

50

Washing powder

Standardized ECE soap reference without optical or chemical whitener

Reference

2024EP0649-S01

Change in colour	Staining	
5	**Cotton** 4-5	**Polyester** 4

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

Standard

EN ISO 13934-1:2013

Equipment

INSTRON Dynamometer

Conditioned date

Start date 12/2/2024 **End date** 29/02/2024

Test date

Start date 12/02/2024 **End date** 29/02/2024

Gauge length	Pretension	Gauge speed
Warp: 200 mm	**Warp:** 5 N	**Warp:** 100 mm/min
Weft: 200 mm	**Weft:** 5 N	**Weft :** 100 mm/min

Atmosphere for conditioning

Temperature (20 ± 2) ºC **Relative Humidity** (65 ± 4) %

Number of test specimens per material to be tested

Tested 5 **Rejected** 0

State of the specimens

Conditioned

Reference

2024EP0649-S01

Direction	Maximum force *(N)*	Medium strength	C.V.	Elongation to the maximum load*(%)*	Average elongation	C.V.
Warp	2000	2000	1,8	16,5	16,5	1,8
	2100			16		
	2100			16,5		
	2000			16		
	2000			16,5		
Weft	1100	1000	2,7	18,5	18,5	3,2
	1000			19		
	1100			19		
	1000			18		
	1000			17,5		

Uncertainty

± 5% assay value of the measured

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

RESULTS

DETERMINATION OF DIMENSIONAL CHANGE IN WASHING AND DRYING

Standard

EN ISO 5077:2008

Preparation, marking and measuring of fabric specimens according to EN ISO 3759:2011

Start date 12/02/2024 **End date** 21/02/2024

Washing cycles

5

Uncertainty

± 0.4 %

Reference

2024EP0649-S01_P1

Specimen	Direction	Dimensional change (%)
1	WARP	-2.0
	WEFT	0

Note

Positive dimensional change indicates lengthening. Negative dimensional change indicates shrinkage

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01_P1	Woven fabric - AFTER WASH 5 cycles

RESULTS

WATER VAPOUR RESISTANCE

Standard

EN ISO 11092:2014

Test date

Start date 28/02/2024 **End date** 28/02/2024

Atmosphere for conditioning

Temperature (35 ± 0.5) ºC **Relative Humidity** (40 ± 3) %

Conditioning time

24 h. ambient conditions at (35 ± 0.5) ºC and (40 ± 3) % RH

Uncertainty

± 7% of the result

Number of test specimens per material to be tested

Tested 3

Disposition test specimens

The inner face is in contact to the measurement surface.

Reference	Specimen	Water vapour resistance R_{et} ($m^2 \cdot Pa/W$)
2024EP0649-S01	**1**	3.14
	2	3.26
	3	3.38
	Average	3.26

The test was carried out at laboratory located at Carretera Banyeres s/n - 03802 Alcoi, Alicante

Reference	Description
2024EP0649-S01	UNITEC-240

Lucia Martinez
Head of PPE and Ballistics department

Date: 01/03/2024 9:48:06
Digitally Signed by:ISABEL LLOPIS LUMBRERAS - NIF:21678551Q

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