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Client Ullfrotté AB Chaufförvägen 29 831 48 Östersund	Client's ref. nr.		
	Contact person Sofia Åberg	Our ref. nr. 5090325	

Object: Determination of various properties of three fabrics.

Test material: 1) Wool terry original, 200g/m², green.
2) Wool terry original, 400g/m², dark navy.
3) Wool terry original, 600g/m², green.

The test material was received from the client 2009-05-25.
The commission was performed 2009-05-25—06-05.

Summery:

Property	Sample 1 200g/m ² , green	Sample 2 400 g/m ² , navy	Sample 3 600 g/m ² , green
Colour fastness			
to laundering	Staining: 4-5 Colour change: 5	Staining: 4* Colour change: 5	Staining: 4* Colour change: 5
to sweat	Staining pH 5,5: 4-5 pH 8,0: 4-5 Colour change: 5	Staining pH 5,5: 4-5 pH 8,0: 4-5 Colour change: 5	Staining pH 5,5: 4-5 pH 8,0: 4* Colour change: 4-5
to light	4-5	4	4-5
Weight, g/m ²	213	485	693
Dimensional change, %	Length: -1,0 Width: -2,5	Length: -2,5 Width: -4,0	Length: 0,5 Width: -3,0

*Lowest result for staining, for more detailed results see below for each method respectively.

Procedure and results:

Conditioning- and testing climate according to SS-EN ISO 139:2005, (20±2)°C and (65±4)% RH, where nothing else is stated.

Colour fastness to laundering was determined according to SS-EN ISO 105-C06:1997.

Test method: C1S, 60 °C.

Souring treatment was not performed.

Detergent: ECE

Adjacent fabric: Multifibre DW, Testfabrics.

Colour fastness to laundering, rating

	200 g/m ² , green	400 g/m ² , navy	600 g/m ² , green
Staining of			
acetate	4-5	4-5	4-5
cotton	4-5	4-5	4
polyamide	4-5	4-5	4-5
polyester	4-5	4-5	4-5
acrylic	4-5	4-5	4-5
wool	4-5	4	4
Change in colour	5	5	5

Scale 1-5, where 5 is the best.

Stating the measuring uncertainty is not relevant for this type of test.

Colour fastness to perspiration was determined according to SS-EN ISO 105-E04:2009.

Adjacent fabric: Multifibre DW, Testfabrics

The fan in the oven is set on lowest effect.

Colour fastness to perspiration, rating

	200 g/m ² , green		400 g/m ² , navy	
	pH 5,5	pH 8,0	pH 5,5	pH 8,0
Staining of				
acetate	4-5	4-5	4-5	4-5
cotton	4-5	4-5	4-5	4-5
polyamide	4-5	4-5	4-5	4-5
polyester	4-5	4-5	4-5	4-5
acrylic	4-5	4-5	4-5	4-5
wool	4-5	4-5	4-5	4-5
Change in colour	5	5	5	5

600 g/m², green		
	pH 5,5	pH 8,0
Staining of		
acetate	4-5	4-5
cotton	4-5	4
polyamide	4-5	4-5
polyester	4-5	4-5
acrylic	4-5	4-5
wool	4-5	4-5
Change in colour	4-5	4-5

Scale 1-5, where 5 is the best.

Stating the measuring uncertainty is not relevant for this type of test.

Colour fastness to artificial light was determined according to SS-EN ISO 105-B02:1999 and ISO 105-B02:2000/Amd. 2:2000.

Exposure conditions: Normal

Exposure method: 2

Test apparatus: Xenotest 150 S

Viewing conditions: Light Cabinet Ortospectra 120, D65

The exposure was discontinued when the light fastness rating 3 at the reference scale had been reached.

Colour fastness to artificial light	
Test material	Rating
200 g/m², green	4-5
400 g/m², navy	4
600 g/m², green	4-5

Scale 1-8, where 8 is the best.

Stating the measuring uncertainty is not relevant for this type of test

Mass per unit area was determined according to SS-EN 12127:1997.
The sampling procedure with load

Mass per unit area, g/m²

Specimen	200g/m ² , green	400 g/m ² , navy	600 g/m ² , green
Mean value	213	485	693

The uncertainty of measurement for mass per unit area:

200g/m ² , green	± 4%
400 g/m ² , navy	± 3%
600 g/m ² , green	± 4%

The uncertainty of measurement is stated as expanded uncertainty of measurement with the coverage factor k= 2, corresponding to a coverage probability of approx. 95 % for normal distribution of homogeneous materials.

Standard uncertainty of measurement is determined according to GUM.

Dimensional change after washing and drying

Preparation, marking and calculation was performed according to SS-EN ISO 3759:2008 and SS-EN ISO 5077:2008

Number of specimens: 2

Specimen size: (60 x 60) cm

Washing was performed as described below.

Washing and drying was performed according to SS-EN ISO 6330:2001+A1:2009.

Water supply: 17 l/min

Washing procedure: 2 A (60 °C)

Detergent used: 4 (IEC A*+ sodium perborate+TAED)

Dosage: 1 g/l

Number of washes: 1

Total load (loading fabric and test specimens): 2 kg

Loading fabric: 100 % knitted Polyester, (310±20) g/m²

Drying procedure: E, tumble dry

Temperature: max 50 °C

Deviations from the standard:

Tumble dryer: Nyborg, model 210 T,

Drum volume: approx. 220 l, no reversal drum,

Only one vane, height 12 cm, depth 20 cm

Rotational frequency: 40 min⁻¹, 5 kW heating input

Determination of drying capacity was not performed.

The material was dried until the weight of the tested material was +2 % higher than the original weight.

Dimensional change after washing and drying, %

	length	width
200g/m², green		
Mean value	-1,0	-2,5
400 g/m², navy		
Mean value	-2,5	-4,0
600 g/m², green		
Mean value	0,5	-3,0

The mean value is rounded to the nearest 0,5 %.

The uncertainty of measurement for the mean value:

200g/m², green ± 1,9 percent units

400 g/m², navy ± 3,5 percent units

600 g/m², green ± 2,0 percent units

The uncertainty of measurement is stated as expanded uncertainty of measurement with the coverage factor $k=2$, corresponding to a coverage probability of approx. 95 % for normal distribution.

Standard uncertainty of measurement is determined according to GUM.

All results relate only to the materials tested.

Möln dal, 2009-06-08

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