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Client Ullfrotté AB Chaufförsvägen 29 831 48 Östersund	Client's ref. nr.		
	Contact person Sofia Åberg	Our ref. nr. 5080244	

Object: Determination of various properties of three fabrics.

Test material: Fabrics and garment according to list below:

1. Woolpower Crewneck 200, one piece of fabric and one sweater.
2. Wollpower Full Zip Jacket 400, one piece of fabric and one jacket.
3. Woolpower FR Full Zip Jacket 400, one piece of fabric and one jacket.

The test material was received from the client 2008-03-12 .
The commission was performed 2008-03-12—04-21

Procedure and results:

Conditioning- and testing climate, where nothing else is stated:
(20 ±2) °C and (65±3) % RH.

Dimensional change after washing and drying

Preparation, marking and calculation was performed according to
SS-EN ISO 3759:1995 and SS-EN 25 077:1994
Number of specimens: 1 per material
Specimen size: appr. (50 x 50) cm
The back part of the garment was tested.

Washing and drying was performed according to SS-EN ISO 6330:2001

Washing machine: Type A, Electrolux Wascator FOM 71 MP-Lab

Water supply: 17 l/min

Washing procedure 2A, 60 °C

Detergent: IEC A "Star" /Sodium Perborate tetrahydrate/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 70 °C

Deviations from the standard:

Tumble dryer: Nyborg, model 210 T,

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

Only one vane, high 12 cm, depth 20 cm

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

Determination of drying capacity was not performed.

Sample	Measuring distance	Dimensional change, %	
		Length	Width
1.	1	-4,8	-7,1
	2	-5,2	-6,7
	3	-4,5	-4,8
Mean value		-4,8	-6,2
Uncertainty of measurement		2,5 %	
2.	1	-2,1	-4,4
	2	-0,9	-5,8
	3	+0,5	-4,0
Mean value		-0,8	-4,8
Uncertainty of measurement		2,5 %	
3.	1	-3,6	-3,6
	2	-2,6	-4,0
	3	-2,3	-2,0
Mean value		-2,8	-3,2
Uncertainty of measurement		2,5 %	

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.

Determination of abrasion resistance of fabrics by the Martindale method

was performed according to SS-EN ISO 12947-2:1999/SS-EN ISO 12947-2/AC:2006.

Testing- and conditioning atmosphere: (20±2)°C and (65±3)% RH.

The specimens were preparatory treated according to annex A.1.

Pressure used: 9 kPa.

Test serie for all samples: 2 000 rubs.

Specimen breakdown definition: One thread broken.

The test was performed on all three materials.

Abrasion resistance, number of rubs at which breakdown has not yet been observed

	Sample		
	1	2	3
Specimen 1	14 000	20 000	16 000
Specimen 2	14 000	16 000	20 000
Specimen 3	14 000	16 000	20 000
Mean value	14 000	17 300	18 700
Uncertainty of measurement	±15 %	±22 %	±21 %

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.

Resistance to pilling and surface fuzzing was determined according to SS-EN ISO 12945-1:2001, pilling box method (Not an accredited method).

Number of specimens: 4 (2 in each direction)

Number of revolutions: 15 000.

Number of observers: 2

Viewing conditions: Light Cabinet Ortospectra 60, D65, worst angle.

Resistance to pilling and surface fuzzing, rating

Sample	<u>1</u>		<u>2</u>		<u>3</u>	
Direction	Length	Width	Length	Width	Length	Width
Assessment	3	4	3-4	3-4	4	4

Scale 1-5, where 5 is best.

Pills and surface fuzzing appeared on the test specimens.

All results relate only to the material tested.

Möln dal, 2008-04-22
Swerea IVF



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