PRÜFSTELLE TEXTIL

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Von der Federation Internationale de L'Automobile (FIA) Paris zugelassene Stelle zur Prüfung von Schutzkleidung für Auto-Rennfahrer - FIA standard 8856-2000

UNTERSUCHUNGSBERICHT I TESTREPORT

Order No. STFI:	**0835/10**
Order no. applicant:	-
Date:	02 July 2010
Testing officer:	Möller/Beier
Applicant:	DEVOLD of Norway AS Mr. Ole Andreas Devold 6030 Langevag NORWAY

Testing application:

of:	05 May 2010
order receipt on:	26 May 2010
sample receipt on:	26 May 2010

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Test specimen: fabric and garments for protection against thermal risks of an electric arc

Marking by applicant	Coding for testing	Coding for arc testing
Knitted fabric SPIRIT Qual.120, double structure with wool outside and viscose inside, 52% Viscose FR / 48% FR wool, black, approx. 210 g/m²	sample 01	10-HT 1…HT 4
Knitted fabric THERMAL Qual.177, single jersey w/raised inlay 100% FR wool Zirpro treated, grey, approx. 450 g/m²	sample 03	10-HV 1…HV 4
Shirt Qual.120 with neck zipper, black	sample 04	10-HW 1
Jacket Qual.177 with full zipper, black/grey	sample 05	10-HX 1

The sampling happened by the applicant. There is no information about the sampling method.

Testing method/testing conditions:

Testing of material according to EN 61482-1-2:2007

Property	**Test method**
Arc thermal resistance requirements *tested after pre-treatment*	EN 61482-1-2, box test method [1)] Class 1…4 kA / Class 2…7 kA

1) Electrical arc test according to EN 61482-1-2:2007

Testing of materials according to EN 61482-1-2:2007, "Live working - Protective clothing against the thermal hazards of an electric arc - Part 1: Test methods - Method 2: Determination of arc protection class of material and clothing by using a constrained and directed arc (box test)".

According to IEC 61482-2 Ed.1 2009-04 "Live working - Protective clothing against the thermal hazards of an electric arc – Part 2: Requirements" it has to be considered that both outer material and innermost lining shall fulfil the Index 3 of EN ISO 14116. This standard requires also a consideration of possible electric shock hazards by use of conductive fibres. To fulfil this demand, the test and the appropriate requirement for vertical resistance given in EN ISO 11611 should be considered.

Pre-treatment: 5 washing cycles 40°C according to EN ISO 6330+A1:2009, method 5A+A, drying on the line

Test conditions:

- Prospective electric arc current: **4 kA** (corresponding to **Class 1**)
- Arc duration: 500 ms
- Voltage of open test circuit: 400 V
- Copper- / aluminium electrodes: electrodes gap 3 cm
- Electrodes distance to sample: 30 cm

The tests were carried out in co-operation with High Current Testing Thomas v. Freyberg at the International Institute for Product Safety in Bonn/ Germany. The Sub-lab works on basis of quality management system for the test method. A representative of STFI was present during the tests.

Test results:

Property	Dimension	Test results fabric Qual.120			
		10-HT1	10-HT2	10-HT3	10-HT4
		class 1 / 4 kA			
Afterflame time	s	0	0	0	0
Melting through to the inside		no	no	no	no
Hole formation		no[1)]	no[1)]	no[1)]	no[1)]
Maximum temperature rise T_{max} at the back-side of the specimen (both calorimeter)	K K	11,0 9,2	11,0 9,8	10,9 11,3	11,1 12,4
Maximum time t_{max}	s s	16,8 17,8	16,6 13,8	15,2 15,8	15,0 14,2
Comparison: allowed temperature rise to avoid 2nd degree burning (STOLL values at time t_{max})	K K	20,6 21,0	20,5 19,5	20,0 20,3	20,0 19,6
Acceptance criteria		met	met	met	met

1) surface in exposure area partially reduced

Property	Dimension	Test results fabric Qual.177			
		10-HV1	10-HV2	10-HV3	10-HV4
		class 1 / 4 kA			
Afterflame time	s	0	0	0	0
Melting through to the inside		no	no	no	no
Hole formation		no	no	no	no
Maximum temperature rise T_{max} at the back-side of the specimen (both calorimeter)	K K	6,4 6,7	4,9 5,8	6,0 5,7	6,8 6,6
Maximum time t_{max}	s s	22,3 21,8	26,7 25,1	25,9 25,2	25,8 25,6
Comparison: allowed temperature rise to avoid 2nd degree burning (STOLL values at time t_{max})	K K	22,4 22,2	23,6 23,2	23,4 23,2	23,4 23,3
Acceptance criteria		met	met	met	met

Property	Dimension	Test results sample 04 - Shirt Qual.120 10-HW1
		class 1 / 4 kA
Afterflame time	s	0
Hole formation		no[1)]
Melting through to the inside		no
Closure system of the garment functionally after arc exposure		yes

1) surface in exposure area partially reduced

Property	Dimension	Test results sample 05 - Jacket Qual.177 10-HX1
		class 1 / 4 kA
Afterflame time	s	0
Hole formation		no
Melting through to the inside		no
Closure system of the garment functionally after arc exposure		yes

Test results refer to the delivered specimen. Test protocols and statistical information about test data can be viewed in the test house. This Test Report consists of 4 Pages and should not be published in parts.

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stfi geprüft

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