

APPROVAL

FOR ESD PROTECTIVE PRODUCTS ACCORDING TO IEC 61340

Validity of the approval

Until 2015-11-12.

Holder of the approval

Kwintet Fristads AB, Fristad, Sweden

Category of product

Protective clothing

Products

Manufacturer/ supplier	Type designation	Description
Fristads AB	100654 107799	Trousers made of polyester (63 %), cotton (35 %) and carbon fibres (2 %). The trousers have pockets.

Washed 45 times in 60 °C.

Documentation for approval

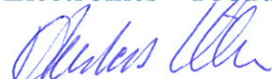
Test report FX212036.

The ESD-approval does not include any requirements regarding electrical safety properties. If work will be performed close to live voltages, requirements according to national regulations shall be obeyed.

Conditions for approval

General conditions, according to SP-Method 2472, for approval and registration of approved products with regard to ESD-protection qualities.

SP Technical Research Institute of Sweden Electronics – Product Safety


Anders Nilsson
Technical Manager


Sven Byheden
Technical Officer

SP Technical Research Institute of Sweden

Postal address
SP
Box 857
SE-501 15 Borås
SWEDEN

Office location
Västerås
Brinellgatan 4
SE-504 62 Borås
SWEDEN

Phone / Fax / E-mail
+46 10 516 50 00
+46 33 13 55 02
info@sp.se

This document may not be reproduced other than in full,
except with the prior written approval of SP.

Kwintet Fristads AB
Kicki Malm
513 80 FRISTAD

Test of pike shirts regarding electrostatic protective properties

1 Client

Kwintet Fristads AB, Fristad, Sweden

2 Test objects

Blue trousers with art. No. 100654 manufactured by Fristads AB.
The trousers were made of polyester (63 %), cotton (35 %) and carbon fibres (2 %).
The trousers had pockets.



art. No. 100654



close-up of the fabric

Three trousers arrived at SP 2012-10-26.

SP Technical Research Institute of Sweden

Postal address
SP
Box 857
SE-501 15 BORÅS
Sweden

Office location
Västeråsen
Brinellgatan 4
Borås

Phone / Fax / E-mail
+46 10 516 50 00
+46 33 13 55 02
info@sp.se

This document may not be reproduced other than in full, except with the prior written approval of SP.

3 Commission

Tests for ESD-approval according to IEC 61340.

4 Performance and result

Measurements were performed 2012-11-05 by Sven Byheden according to ANSI/ESD STM 2.1 and NT ELEC 037, 2006 (SP-method 2472, issue 6 with appendix 12, issue 3).

Before the test all trousers were washed 45 times in 60 °C and conditioned during more than 72 h in 23 ± 2 °C and 12 ± 3 % RH.

The measurements were performed in the same atmosphere.

4.1 Point to point resistance (ANSI/ESD STM 2.1)

Two conductive electrodes (2.27 kg; Ø 63.5 mm) were placed on different panels of the test object.

The electrode assembly was energized at 100 VDC and the resistance values were recorded after 15 ± 2 s.

The measurement was repeated between all panels of the trousers.
All trousers were tested.

Result: All measured values were in the range $2.4 \times 10^6 \Omega$ to $2.7 \times 10^6 \Omega$.

The requirement was fulfilled. All resistance values were less than $10^9 \Omega$.

4.2 Discharge time measurement, worn garment (NT ELEC 037)

The test person wore the trousers with regular clothes underneath and was grounded with a wrist strap. A capacitor (1000 pF) was charged to 550 V and was discharged to a clip connected to the pike shirt. The test was repeated with the clip connected to different parts of the trouser.

Discharge time from 500 V to 100 V was measured.

Result

Maximum measured value was 156 ms.

The requirement was fulfilled. All discharge times were less than 20 s.

4.3 Electrostatic potentials (IEC 61340)

Tests according to SP-method 2472, issue 6, section 7.3.

Electrostatic potentials were additionally measured in close vicinity of parts having a resistance to ground higher than $10^9 \Omega$. Induced potentials on a small metal plate (\varnothing 20 mm, 2 pF) were measured at a distance of 20 mm from the trousers, 2 s after a slight touch with the hand or cloth of the tested part.

Instrument: SP inv. No. 501781 (instrument uncertainty less than $\pm 1\%$).

Result

Maximum measured electrostatic potential was 78 V.

The requirement was fulfilled. All measured electrostatic potentials were less than 100 V.

4.4 Marking

Requirements were fulfilled. The trousers were marked with manufacturers name, art. No. and ESD-symbol.

5 Summary

The test objects fulfilled the requirements for ESD-approval according to IEC 61340-5-1, edition 1.0, 2007 provided the marking is supplemented.

The test result applies to the tested objects only.

SP Technical Research Institute of Sweden **Electronics - Product Safety**

Performed by



Sven Byheden

Examined by



Anders Nilsson