

TEST REPORT

2020CO1010

DATE OF RECEPTION

06/06/2019

DATE TESTS

Starting: 07/06/2019

Ending: 23/09/2019

APPLICANT

ARITEKS BOYACILIK TICATET VE SANAYI AS
Hekimsuyu Cad No:36
TR-34250
ISTANBUL

Att. Ibrahim Susin

IDENTIFICATION AND DESCRIPTION OF SAMPLES

REFERENCES

ARC PROTECTIVE T-SHIRT

According to the information supplied by the customer:

Article number: Aramid D50 Pike-5869

Composition: 93% M-ARAMID 5% P-ARAMID 25 CARBON

Weight: 200 - 220 g/m²

Style: Pique knit fabric

Color: Navy

TESTS CARRIED OUT

- PRE-TREATMENT FOR DOMESTIC WASHING AND DRYING PROCEDURES FOR TEXTILE TESTING.
- ELECTRIC ARC TEST.

Tests marked with * are not included within the scope of the ENAC accreditation



RESULTS

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

Standard

ISO 6330:2012

Standard deviation

Reference

Sample1 ARC PROTECTIVE T-SHIRT

Units 1**Equipment** Wascator 04123E12**Washing procedure** 4N **Washing cycles** 5**Drying procedure**

C (horizontal)

Washing powder

ECE detergent 98 + sodium perborate + TAED

Units	Dry mass of the samples	Equipment
1	2,100 Kg	Wascator 04123E12

Start and finish date

02/07/2019 - 03/07/2019

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RESULTS

ELECTRIC ARC TEST

Standard	EN 61482-1-2:2014 equivalent to IEC 61482-1-2:2014
Principle of the Box test method	Determine the behaviour of materials against to thermal risk when exposed to heat energy from electric arc with specific characteristics Materials performance for this procedure is determined from the amount of the heat transmitted through the specimen and other thermal parameters
Sample type	Knitted fabric, navy blue colour with a weight according to the customer of 180 g/m ²

Test conditions	
Class	Class 1
Testing atmosphere	23,73 °C 39,50 % RH
Test current I_{class} for class 1	4 kA ± 5%
Calibration test current	3892,92 A
Average direct exposure incident energy E_{io}	153,57 kJ/m ²
Arc duration	500 ms ± 5%
Average real arc duration	475,85 ms
Test voltage	400 V ± 5%
Average real test voltage	394,4425 V
Average real Arc Energy W_{arc}	166,29 kJ

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RESULTS

ELECTRIC ARC TEST

Test conditions	
Gap between electrodes	(30 ± 1) mm
Distance between the electrodes and sample	(300 ± 5) mm

Electrodes type

Electrodes Cu/Al

Measurement uncertainty

Temperature 17% of the measured value in °C

Equivalent energy 17% of the measured value in kJ/m²

Time ± 0,390 s

Technician performing the test

David Lázaro

Person verifying the test report

Lucía Martínez

Pre-treatment

5 washing cycles at 40°C, according to standard ISO 6330:2012, method 4N; and C drying

Pre-conditioning of the test specimens

24h. in indoor ambient conditions between (18-28)°C and between (45-75)% RH

Starting and ending pre-conditioning date

03/07/2019 - 09/07/2019

Observation or deviation of the standard

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RESULTS

ELECTRIC ARC TEST

Testing date 09/07/2019
Reference ARC PROTECTIVE T-SHIRT

VISUALLY OBTAINED DATA

Property	Measurement	Specimen 1	Specimen 2	Specimen 3	Specimen 4
	Class	1	1	1	1
Burning time	Video	0,00 s	0,00 s	0,00 s	0,00 s
Hole formation > 5 mm	Visual	No	No	No	No
Melting through to the inner side	Visual	No	No	No	No
Embrittlement	Visual	No	No	No	No
Damage on the outside	Visual	No	No	No	No
Charring on the outside	Visual	Yes	Yes	Yes	Yes
Dripping	Visual	No	No	No	No
Shrinkage	Calculated	No	No	No	No

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RESULTS

ELECTRIC ARC TEST

Reference

ARC PROTECTIVE T-SHIRT

COMPUTER OBTAINED DATA

Class 1				
Property	Specimen 1	Specimen 2	Specimen 3	Specimen 4
Transmitted incident energy E_{it}	76,48 kJ/m ²	83,26 kJ/m ²	73,32 kJ/m ²	83,29 kJ/m ²
Time to delta peak temperature t_{max}	29,79 s	29,62 s	29,62 s	29,50 s
Delta peak temperature ΔT_p	13,86 °C	15,08 °C	13,28 °C	15,09 °C
Differences ΔE_i of the transmitted energy values to the Stoll limit value at t_{max}	-57,91 kJ/m ²	-50,91 kJ/m ²	-60,85 kJ/m ²	-50,72 kJ/m ²
Maximum difference between the transmitted energy E_{it} to the Stoll energy E_{iSTOLL} in $t_i^{(1)}$	-20,33 kJ/m ²	-18,59 kJ/m ²	-18,78 kJ/m ²	-18,11 kJ/m ²
Excess of the Stoll curve by the heat curve of the transmitted incident energy $E_{it}(t)$	No	No	No	No

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RESULTS

ELECTRIC ARC TEST

Remark

t_i is the time where the difference between the transmitted incident energy E_{it} and the Stoll Energy E_{iSTOLL} is maximum.

⁽¹⁾ Interpretation: In negative value, a higher difference implies a better behavior. In positive value, a less difference implies a better behavior, considering that the material fails the test.

**IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA ACCORDING TO
EN 61482-1-2:2014, FOR CLASS 1**

PASS

Requirement for the standard compliance EN 61482-1-2:2014

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|---|
| a) Burning time ≤ 5 s. |
| b) No melting through to the inner side. |
| c) No hole bigger than max. 5 mm. in any direction in the innermost layer. |
| d) All four pairs of values ($E_{it} - t_{max}$) are below corresponding Stoll values, and all four heat curves $E_{it}(t)$ of transmitted energy are at any moment of time "t" of the exposure period below Stoll curve. |
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RESULTS

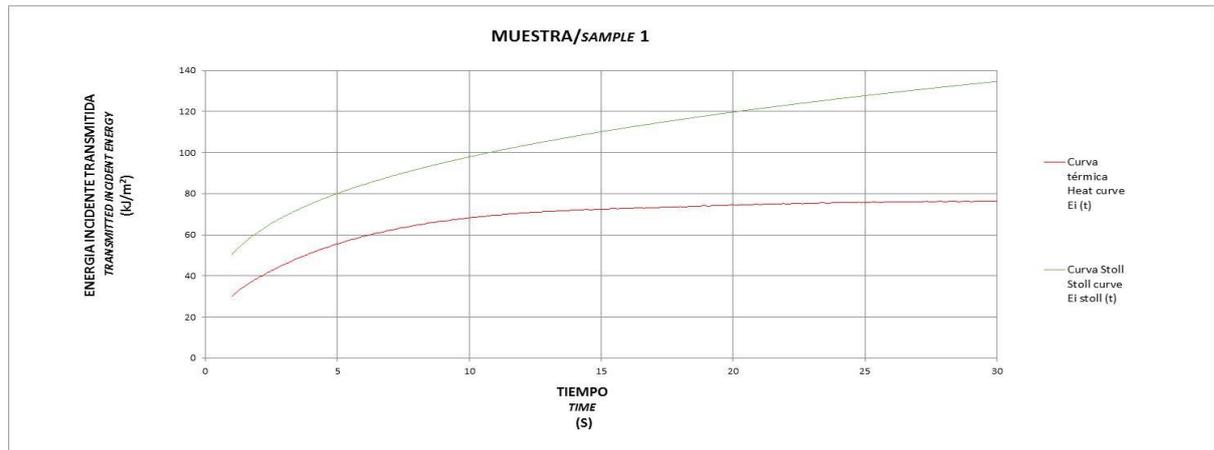
ELECTRIC ARC TEST

STOLL CURVES

Specimen 1

Reference

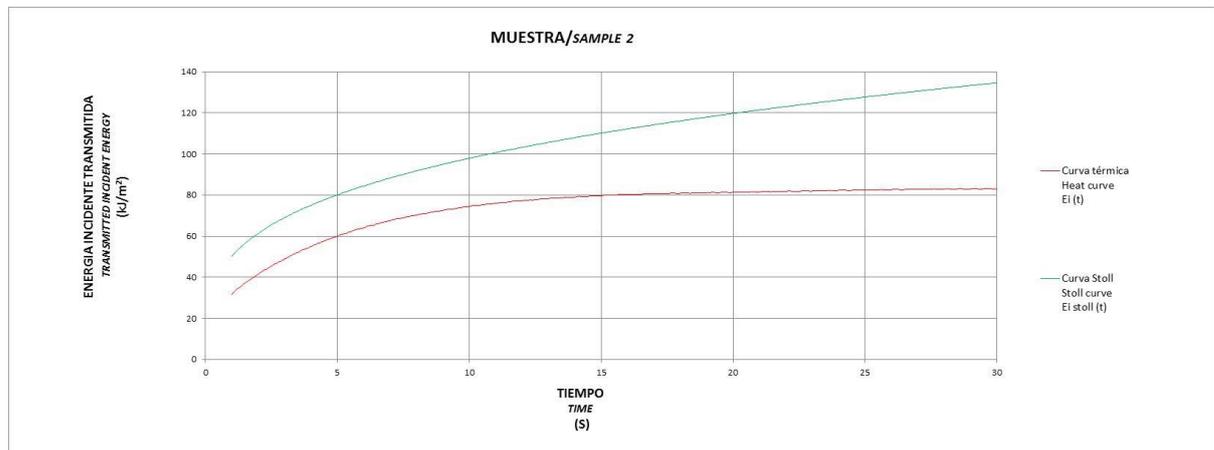
1- ARC PROTECTIVE T-SHIRT



Specimen 2

Reference

2- ARC PROTECTIVE T-SHIRT



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RESULTS

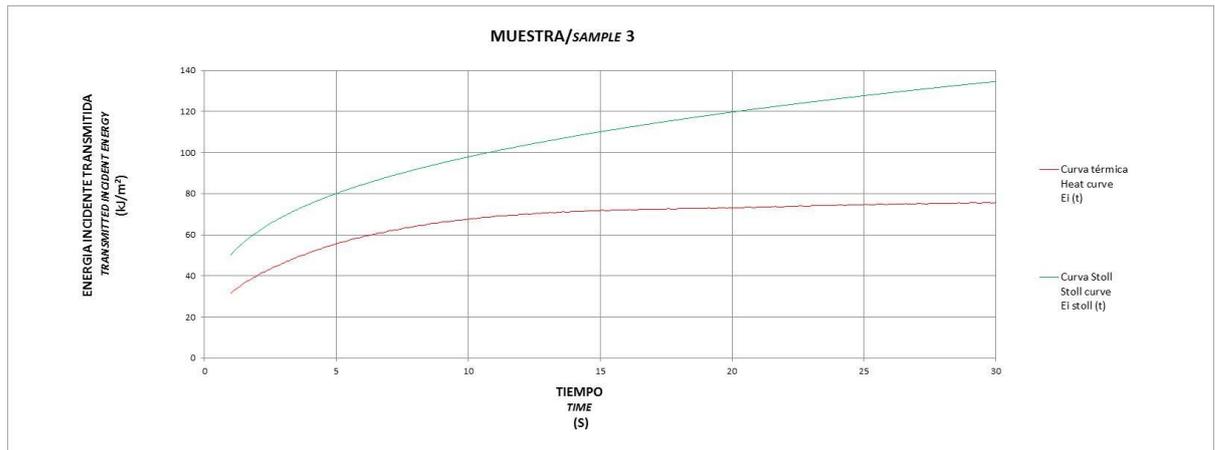
ELECTRIC ARC TEST

STOLL CURVES

Specimen 3

Reference

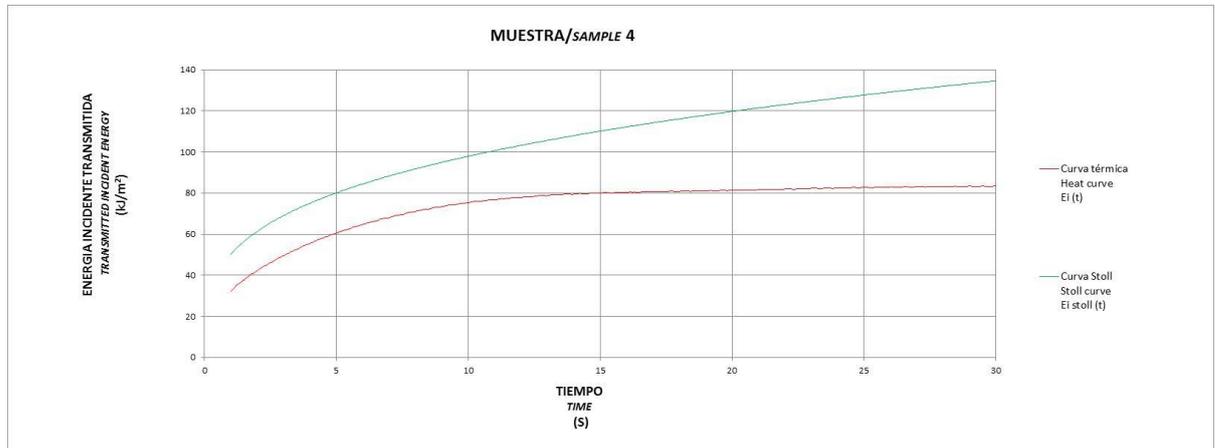
3- ARC PROTECTIVE T-SHIRT



Specimen 4

Reference

4- ARC PROTECTIVE T-SHIRT



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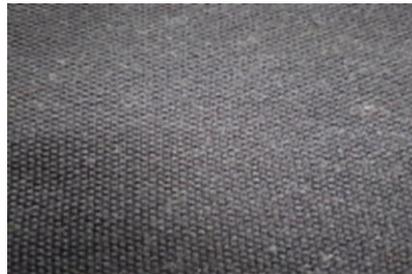
RESULTS

ELECTRIC ARC TEST

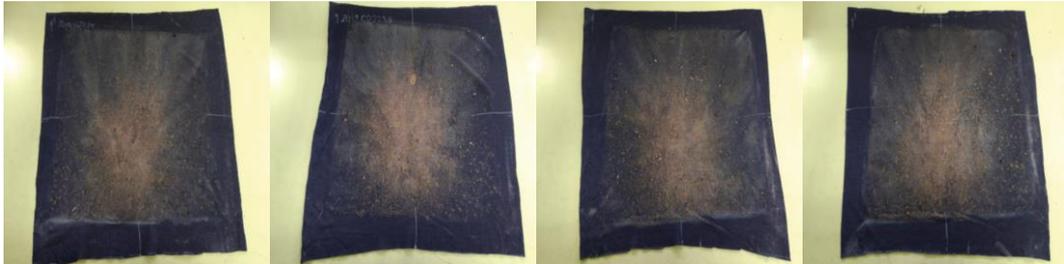
Reference

ARC PROTECTIVE T-SHIRT

Original material



Tested material



Remark

The electric arc test is performed in: Cr. Villaviciosa de Odón a Móstoles (M-856) Km. 1,5 Móstoles 28935.

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Begoña Pico
Head of Public Tenders Division

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