

Hugh Hoagland Consulting, Inc.

ArcWear.com

Electric Arc Exposure Tests

For XM Textiles

Material System

7.7 oz/yd² 260 g/m² Satin 4/1 88% Cotton 12% Nylon

Style: 88C/11N/1AS-260FR-S-TF-AP VOLCANO

Color: Red

Actual Areal Density (AAD): 7.7 oz/yd² 261 g/m²

Report Number: 1208P37 Revision: 00

September , 2012

Tests Conducted by Kinectrics High Current Laboratory
Toronto, Ontario, Canada

Electric Arc Exposure Report

ASTM F 1959/F 1959M-06 aE1 Standard Test Method for Determining the Arc Rating of Materials for Clothing

General

At the request of Wu Cong Jun , electric arc exposure tests were conducted on textile systems for XM Textiles . Wu Cong Jun arranged with ArcWear.com to facilitate testing by the High Current Laboratory of Kinectrics in Toronto and to review test data.

The tests documented in this report were conducted in accordance with ASTM International Standard F 1959/F 1959M -06 aE1 Standard Test Method for Determining the Arc Rating of Materials for Clothing.

Test samples

The test material was received on August 06, 2012. The test material was washed 3 times and dried by ArcWear.com in accordance with requirements of the above standard. Following the washing procedure, material was cut into panel test specimens.

Test results

The test program includes minimum of twenty individual panel arc trials. The following test data was recorded for each trial:

- arc exposure electrical conditions: arc trial number, RMS arc current, peak arc current, arc voltage, arc duration, energy dissipated in arc, plots of arc current and arc voltage
- temperature rise response from two monitor and two panel sensors for each panel in each trial, plot of average responses from two panel and two monitor sensors, plot of Incident energy distribution E_i from bare shot analysis
- photographs of exposed material panels
- video

Above mentioned test data is part of report and is available for download from ArcWearOnline.com arc testing website. Test data is accessible only to and protected with XM Textiles unique password .

Essential test data and test results are presented in the table below and on the attached data pages as follows:

- arc rating ATPV or EBT or both and plots of the burn injury probability (ATPV) or breakopen probability (EBT) or both versus E_i
- test specimen description and order of layer
- distance from an arc center line to the panel surface
- subjective evaluation
- heat attenuation factor (HAF) and plot of HAF on E_i
- ignition probability value (if determined during testing)

Rating

Material system specified in the table below received Arc Rating as

ATPV = 8.2 cal/cm²

Customer	XM Textiles
Material design	7.7 oz/yd ² 260 g/m ² Satin 4/1 , 88% Cotton 12% Nylon
Style	88C/11N/1AS -260FR -S-TF -AP VOLCANO
Color	Red
Actual Areal Density (AAD) as tested	7.7 oz/yd ² 261 g/m ²

The order of layering is numbered starting from the outer layer listed first.

Requested by: Wu Cong Jun

Approved by Hugh Hoagland
Arcwear.com

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- b) assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method, or process disclosed in this report

Report # K-418465-1208P37

Test Report

Kinectrics Inc., 800 Kipling Avenue, Unit 2
Toronto, Ontario, Canada
Tel: 416-207-6000, www.kinectrics.com



ISO 9001-2008

Samples Received:
AUG 8, 2012

Samples Tested:
Sept 7, 2012

Tested for

Hugh Hoagland
ArcWear.com
502-333-0510
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Contact information for item tested:

Wu Cong Jun
XM Textiles
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vit@xinmeng.com.br

Test item description

XM Textiles, Style 88C/11N/1AS-260FR-S-TF-AP VOLCANO,
7.7 oz/yd² 260 g/m² Satin 4/1, 88% Cotton 12% Nylon, Red,
AAD 7.7 oz/yd² 261 g/m²,
ArcWear# 1208P37

Reference Standard

ASTM F1959/F1959M-06ae1

Standard Test Method for Determining Arc Thermal Performance of Textile Materials for Clothing by Electric Arc Exposure Method

Test Parameters:

Test current:	8 kA	Number of samples analysed:	21
Arc Gap:	30 cm		
Distance to Fabric:	30 cm	Incident Energy Range:	6 to 11 cal/cm ²

Arc Rating, ATPV = 8.2 Cal/cm²
Heat Attenuation Factor, HAF = 76%

Summary

The Arc Rating of this material is intended for use as part of a flame resistant garment or system for workers exposed to electric arcs. The samples were tested by Kinectrics as received. The test result is applicable only to the Test Item, other material or color may have different protection level. Actual performance of the complete garment may vary depending on the final design and assembly of the garment. The Arc Rating was calculated based on the data obtained and analysed in accordance with the latest version of the applicable standards. The individual test sheets, graphs, photographs of the samples and video of every test are provided in digital format to the Client for review.

As of August 1, 2010, the arc testing performed to the above mentioned Standard is accredited by the Standards Council of Canada to conform to the requirements of CAN-P-4E (ISO/IEC 17025:2005) by QMI, a division of SAI Global and North America's leading QMS registrar. Adherence to this standard provides one of the strongest assurances of service quality available. As a minimum, since July 1998 all work at Kinectrics is performed to meet the requirements of ISO 9001.

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Note

- The test performed does not apply to electrical contact or electrical shock hazard.
- An unsigned copy of this report is an unofficial reporting of information. Report must be signed to validate test data and conform

Performed by:

Approved by:

Joe Ogrodowczyk
Station Operator
High Current Laboratory
Ph: 416-207-6000

Claude Maurice,
Lab Manager
High Current Laboratory
hcl@kinectrics.com

Date:
Sept 7, 2012

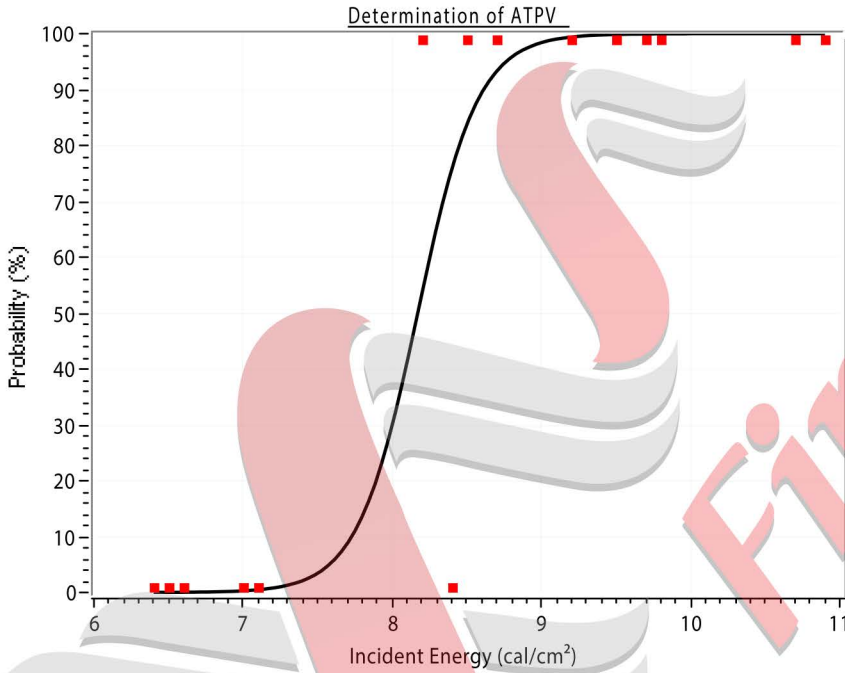
Determination of ATPV by performing logistic regression on panel burn response as indicated in Summary Table

Report #
K-418465-1208P37

Test Performed in accordance with : ASTM F1959/F1959M-06ae1



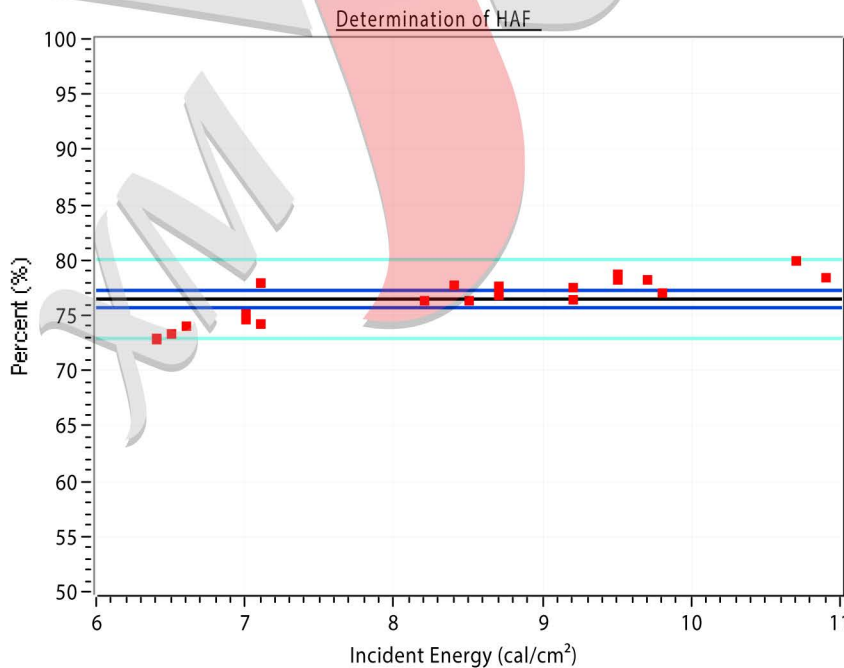
Fabric Description: XM Textiles, Style 88C/11N /1AS-260FR-S-TF-AP VOLCANO, 7.7 oz/yd² 260 g/m² Satin 4/1, 88% Cotton 12% Nylon, Red, AAD 7.7 oz/yd² 261 g/m², ArcWear# 1208P37



ATPV = 8.2 cal/cm²

Probability	Ei
5%	7.6
10%	7.7
20%	7.9
30%	8.0
40%	8.1
50%	8.2
60%	8.3
70%	8.3
80%	8.4
90%	8.6

- # Pts = 21
- # Pts above Stoll = 12
- # Pts Break-Open = 1
- # Pts always >STOLL = 11
- # Pts always <STOLL = 8
- # Pts within 20% = 16
- # Pts in mix zone = 2



HAF = 76 %

Confidence Intervals
95% CI = 75.2 , 76.8

- Data pts
- Best Fit
- 95% CI
- 95% CI pts

Date:
Sept 7, 2012

Report #
K-418465-1208P37

Summary Table

Test Performed in accordance with : ASTM F1959/F1959M-06ae1



Fabric Description: XM Textiles, Style 88C/11N /1AS-260FR-S-TF-AP VOLCANO,
7.7 oz/yd² 260 g/m² Satin 4/1, 88% Cotton 12% Nylon, Red,
AAD 7.7 oz/yd² 261 g/m²,
ArcWear# 1208P37

Summary of measured energy and observations

	Test #	Panel	Test Current A	Cycles of 60Hz	Ei Cal/cm ²	SCD Cal/cm ²	HAF %	Burn Y/N	Break Open Y/N	Ablation Y/N	After Flame sec.	Omit Y/N	Comment
1	K-418465-6518	A	8248	12.1	9.2	0.06	77.6	Yes	-	-	-	No	
2	K-418465-6518	B	8248	12.1	10.9	0.5	78.5	Yes	-	-	-	No	
3	K-418465-6518	C	8248	12.1	9.5	0.1	78.3	Yes	-	-	-	No	
4	K-418465-6519	A	8231	11.1	9.2	0.20	76.5	Yes	-	-	-	No	
5	K-418465-6519	B	8231	11.1	8.5	0.1	76.4	Yes	-	-	-	No	
6	K-418465-6519	C	8231	11.1	9.7	0.2	78.3	Yes	-	-	-	No	
7	K-418465-6520	A	8376	9.1	7.0	-0.04	74.7	No	-	-	-	No	
8	K-418465-6520	B	8376	9.1	8.7	0.1	77.7	Yes	-	-	-	No	
9	K-418465-6520	C	8376	9.1	7.1	-0.2	78.0	No	-	-	-	No	
10	K-418465-6521	A	8348	10.2	6.4	-0.15	72.9	No	-	-	-	No	
11	K-418465-6521	B	8348	10.2	6.4	-0.0	73.0	No	-	-	-	No	
12	K-418465-6521	C	8348	10.2	10.7	0.2	80.0	Yes	y	-	-	No	
13	K-418465-6522	A	8331	9.6	8.4	-0.06	77.8	No	-	-	-	No	
14	K-418465-6522	B	8331	9.6	6.6	-0.2	74.1	No	-	-	-	No	
15	K-418465-6522	C	8331	9.6	8.2	0.1	76.4	Yes	-	-	-	No	
16	K-418465-6523	A	8348	10.1	9.8	0.35	77.1	Yes	-	-	-	No	
17	K-418465-6523	B	8348	10.1	8.7	0.1	76.9	Yes	-	-	-	No	
18	K-418465-6523	C	8348	10.1	7.0	-0.1	75.2	No	-	-	-	No	
19	K-418465-6524	A	8337	10.1	9.5	0.04	78.8	Yes	-	-	-	No	
20	K-418465-6524	B	8337	10.1	6.5	-0.1	73.4	No	-	-	-	No	
21	K-418465-6524	C	8337	10.1	7.1	-0.1	74.3	No	-	-	-	No	
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