

Date:  
September 27, 2005

Report #  
K-422637-02

High Current Test Laboratory  
Kinectrics Inc., Canada  
Test Summary



**Client**

Protective Textile Solutions  
Orangeville, Ontario

**Fabric description**

11.8 oz/yd<sup>2</sup> CarbonX™ C11 Twill, black

**Reference Standard**

ASTM F1959/F1959M-04 Standard Test Method for Determining the Arc Rating of Materials for Clothing

**Test Parameters:**

Test current: 7.98kA

Number of samples analysed: 24

Distance to Fabric: 12

Incident Energy Range: 12 to 18 cal/cm<sup>2</sup>

Arc Gap: 12

**Summary**

The arc rating of this material is intended for use as flame resistant clothing for workers exposed to electric arcs. The material used in this test method are in the form of flat specimens, actual performance of the complete garment may vary depending on the final design and assembly of the garment. This test method does not apply to the electrical contact or electrical shock hazard.

Based on the data obtained and analysed in accordance with the latest version of the applicable standards, the following Arc Rating was calculated.

**Arc Thermal Performance Value, ATPV = 14.9 Cal/cm<sup>2</sup>  
Heat Attenuation Factor, HAF = 80.8%**

Panel data and observations of the fabric samples after the arc exposure were collected and summarized in the attached table. The graphs and statistics on the attached sheets provide more detailed information to better understand the Arc Rating assigned to this material. The client shall review this full report, the video recordings of the arc exposure and the photographs of the samples after the test to determine if the material meets the intended specification.

**Test performed by:**

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**Contact information**

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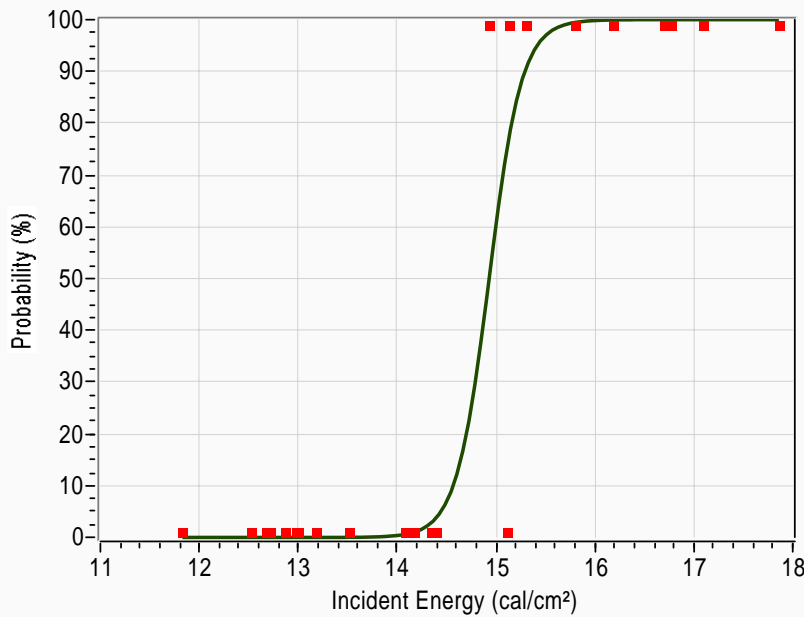
ASTM F1959/F1959M-04  
Standard Test Method for Determining the Arc Rating of Materials for Clothing



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Determination of ATPV, 50% Probability of 2nd Degree Burn

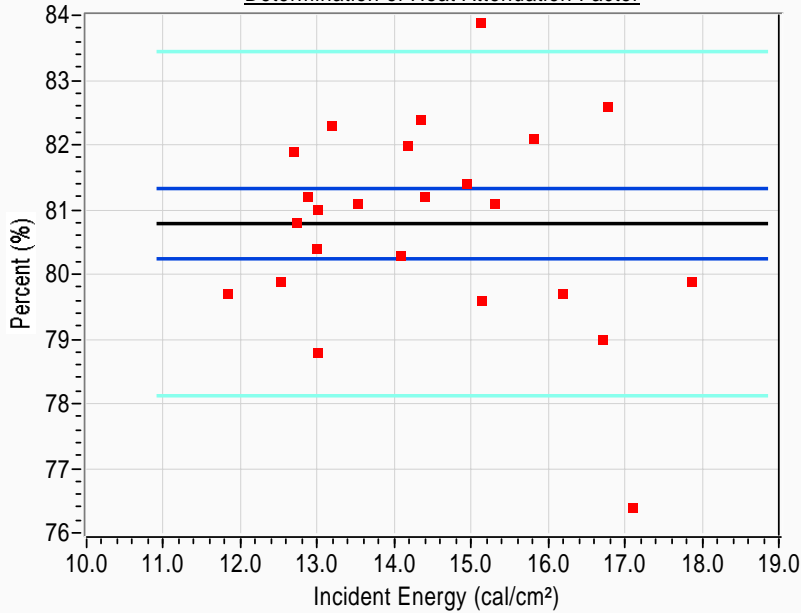


**ATPV = 14.9 cal/cm<sup>2</sup>**

Probability of Burn	Ei
5%	14.4
10%	14.6
20%	14.7
30%	14.8
40%	14.9
50%	14.9
60%	15.0
70%	15.1
80%	15.2
90%	15.3

# Pts = 24  
 # Pts above Stoll = 9  
 # Pts Break-Open = 0  
 # Pts always >STOLL = 8  
 # Pts always <STOLL = 14  
 # Pts within 20% = 23  
 # Pts in mix zone = 2

Determination of Heat Attenuation Factor



**HAF = 80.8 %**

Confidence Intervals  
 95% CI = 80.2 , 81.3

Data pts   
 Best Fit   
 95% CI   
 95% CI pts

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Standard Test Method for Determining the Arc Rating of Materials for



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Test #	Panel	Cycles # (60Hz)	Ei cal/cm <sup>2</sup>	SCD cal/cm <sup>2</sup>	HAF %	Burn yes/no	Break Open Y/N	After Flame sec.	Omit Y/N	Comment	Ignition T-shirt	
1	05-2958	A	18.2	17.09	1.15	76.4	Yes	-	none	No	Surface charred, back not discoloured, not brittle or weak	
2	05-2958	B	18.2	16.70	0.58	79.0	Yes	-	-	No	"	
3	05-2958	C	18.2	17.86	0.73	79.9	Yes	-	-	No	"	
4	05-2959	A	16.2	15.13	0.15	79.6	Yes	-	-	No	"	
5	05-2959	B	16.2	13.51	-0.21	81.1	No	-	-	No	"	
6	05-2959	C	16.2	15.80	0.04	82.1	Yes	-	-	No	"	
7	05-2960	A	14.2	12.52	-0.28	79.9	No	-	-	No	Surface charred, back not discoloured, not brittle or weak	
8	05-2960	B	14.2	12.68	-0.45	81.9	No	-	-	No	"	
9	05-2960	C	14.2	12.87	-0.27	81.2	No	-	-	No	"	
10	05-2961	A	15.2	12.99	-0.07	78.8	No	-	-	No	"	
11	05-2961	B	15.2	11.83	-0.28	79.7	No	-	-	No	"	
12	05-2961	C	15.2	13.00	-0.27	81.0	No	-	-	No	"	
13	05-2962	A	16.2	15.30	0.08	81.1	Yes	-	-	No	"	
14	05-2962	B	16.2	14.08	-0.07	80.3	No	-	-	No	"	
15	05-2962	C	16.2	12.98	-0.26	80.4	No	-	-	No	"	
16	05-2963	A	16.2	16.77	0.15	82.6	Yes	-	-	No	"	
17	05-2963	B	16.2	12.72	-0.22	80.8	No	-	-	No	"	
18	05-2963	C	16.2	13.18	-0.38	82.3	No	-	-	No	"	
19	05-2964	A	16.2	16.18	0.44	79.7	Yes	-	-	No	"	
20	05-2964	B	16.2	15.11	-0.29	83.9	No	-	-	No	"	
21	05-2964	C	16.2	14.39	-0.11	81.2	No	-	-	No	"	
22	05-2965	A	16.2	14.93	0.06	81.4	Yes	-	-	No	"	
23	05-2965	B	16.2	14.34	-0.15	82.4	No	-	-	No	"	
24	05-2965	C	16.2	14.17	-0.12	82.0	No	-	-	No	"	
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