

Hugh Hoagland Consulting, Inc.

ArcWear.com

Electric Arc Exposure Tests

Material System

Layer 1

8.0 oz/yd² 271 g/m² 2x1 LH Twill, 65% Modacrylic 35% N317

Style: 85917 - Protera 180

Color: Navy-10057Q

Actual Areal Density (AAD): 8.0 oz/yd² 271 g/m²

Layer 2

9 oz/yd² 305 g/m² Twill, 100% Cotton

Style: S045 Indura

Color: Navy

Actual Areal Density (AAD): 9.6 oz/yd² 325 g/m²

Report Number: 1102P84, Revision: 00

April, 2011

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

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) = 39.7 cal/cm²

Customer	V@Arc
Layer 1	
Material design	8.0 oz/yd ² 271 g/m ² 2x1 LH Twill, 65% Modacrylic 35% N317
Style	85917 - Protera 180
Color	Navy-10057Q
Actual Areal Density (AAD) as tested	8.0 oz/yd ² 271 g/m ²
Layer 2	
Material design	9 oz/yd ² 305 g/m ² Twill, 100% Cotton
Style	S045 Indura
Color	Navy
Actual Areal Density (AAD) as tested	9.6 oz/yd ² 325 g/m ²

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

Requested by: V@Arc



Approved by Hugh Hoagland
Arcwear.com

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ASTM F1959/F1959M-06ae1

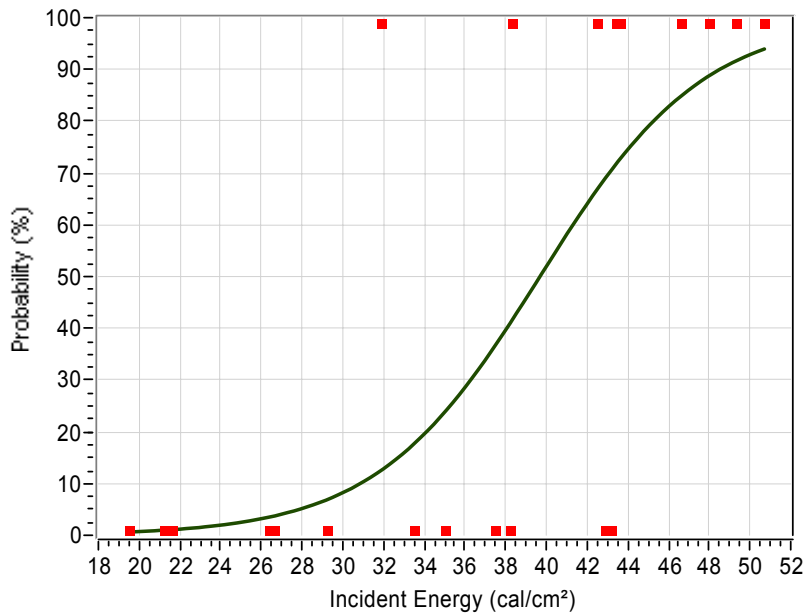
Standard Test Method for Determining the Arc Rating of Materials for Clothing



Client: Y
Y
(Y)
Y

Fabric: Two Layers, Style 85917 - Protera 180 8.0 oz/yd² 271 g/m² 2x1 LH Twill, 65% Modacrylic
Description: 35% N317, Navy 10057Q, AAD 8.0 oz/yd² 271 g/m² over Style S045 Indura 9 oz/yd² 305 g/m² Twill, 100% Cotton, Navy, AAD 9.6 oz/yd² 325 g/m², ArcWear# 1102P84

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

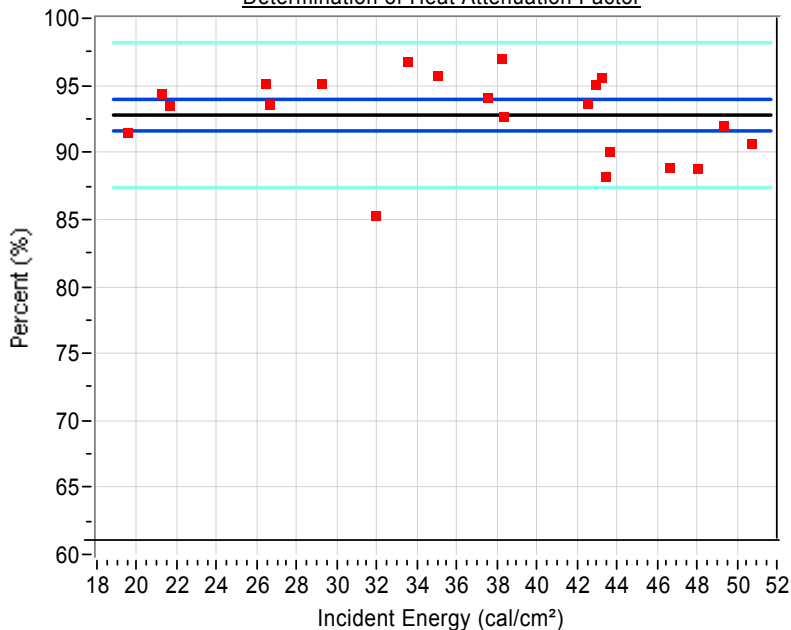


ATPV = 39.7 cal/cm²

Probability of Burn	Ei
5%	27.8
10%	30.9
20%	34.1
30%	36.3
40%	38.1
50%	39.7
60%	41.3
70%	43.1
80%	45.3
90%	48.5

- # Pts = 21
- # Pts above Stoll = 9
- # Pts Break-Open = 6
- # Pts always >STOLL = 6
- # Pts always <STOLL = 6
- # Pts within 20% = 12
- # Pts in mix zone = 9

Determination of Heat Attenuation Factor



HAF = 92.8 %

Confidence Intervals
95% CI = 91.6 , 93.9

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

Ref#: K-418310

Wed, Apr 20, 2011

ASTM F1959/F1959M-06ae1
Standard Test Method for Determining the Arc Rating of Materials for Clothing

Client: Y
Y
(Y)
Y



Fabric Description: Two Layers, Style 85917 - Protera 180 8.0 oz/yd² 271 g/m² 2x1 LH Twill, 65% Modacrylic 35% N317, Navy 10057Q, AAD 8.0 oz/yd² 271 g/m² over Style S045 Indura 9 oz/yd² 305 g/m² Twill, 100% Cotton, Navy, AAD 9.6 oz/yd² 325 g/m², ArcWear# 1102P84

Test #	Panel	Test Current A	Cycles of 60Hz	Ei Cal/cm ²	SCD Cal/cm ²	HAF %	Break Open Y/N	Break Open Y/N	Ablation Y/N	After Flame sec.	Omit Y/N	Comment
1	K-418310-2274	A	8149	60.2	42.9	-0.39	95.1	No	-	Y	-	No
2	K-418310-2274	B	8149	60.2	48.0	3.3	88.8	Yes	Y	Y	-	No
3	K-418310-2274	C	8149	60.2	49.3	2.2	92.0	Yes	Y	Y	-	No
4	K-418310-2275	A	8156	65.2	46.6	3.03	88.9	Yes	Y	Y	-	No
5	K-418310-2275	B	8156	65.2	50.7	2.5	90.7	Yes	Y	Y	1	No
6	K-418310-2275	C	8156	65.2	43.6	2.5	90.1	Yes	Y	Y	-	No
7	K-418310-2277	A	8166	55.2	42.5	0.08	93.7	Yes	-	Y	-	No
8	K-418310-2277	B	8166	55.2	43.2	-0.7	95.6	No	-	Y	-	No
9	K-418310-2277	C	8166	55.2	43.4	2.9	88.2	Yes	-	Y	1	No
10	K-418310-2278	A	8188	50.2	37.5	-0.32	94.1	No	-	Y	-	No
11	K-418310-2278	B	8188	50.2	38.2	-1.1	97.0	No	-	Y	-	No
12	K-418310-2278	C	8188	50.2	31.9	2.6	85.3	Yes	Y	Y	1.5	No
13	K-418310-2279	A	8196	45.2	35.0	-0.89	95.8	No	-	Y	-	No
14	K-418310-2279	B	8196	45.2	33.5	-1.1	96.8	No	-	Y	-	No
15	K-418310-2279	C	8196	45.2	38.3	0.2	92.7	Yes	-	Y	-	No
16	K-418310-2280	A	8194	35.2	26.6	-0.99	93.6	No	-	Y	-	No
17	K-418310-2280	B	8194	35.2	26.4	-1.1	95.2	No	-	Y	-	No
18	K-418310-2280	C	8194	35.2	29.2	-0.7	95.2	No	-	Y	1	No
19	K-418310-2281	A	8210	27.2	21.2	-1.18	94.4	No	-	Y	-	No
20	K-418310-2281	B	8210	27.2	19.5	-1.0	91.5	No	-	-	-	No
21	K-418310-2281	C	8210	27.2	21.6	-1.1	93.5	No	-	Y	-	No
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