Test Performed for
ArcWear.com
Louisville, KY 40223
www.ArcWear.com

Garments provided by
DuPont do Brasil S/A
Al. Itapecuru, 506 - Alphaville
Barueri / SP CEP: 06454-080 Brazil
+55(011)41668966

GARMENT EVALUATION
Khaki Coverall

OBSERVATION OF WORK GARMENTS EXPOSED
TO AN ELECTRIC ARC
IEC 61482-1-1 Method B-2009

IEC 61482-1-1-2009 Live working – Protective clothing against the thermal hazards of an electric arc – Part 1-1: Test methods – Method 1: Determination of the arc rating (ATPV or EBT50) of flame resistant materials for clothing

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Kinectrics Inc. Report No.: K-418608-1311T03

Item received: November 08, 2013
Test Date: November 19, 2013

Observer: Hugh Hoagland
Arcwear.com
Louisville, KY
Office: 502-333-0510

2013.12.03
08:59:27 -05'00'

Kinectrics Incorporated 1612086 Ontario, Canada

Approved by: Claude Maurice
Laboratory Manager, HCL
Kinectrics Inc
Ph: 416-207-6305

PRIVATE INFORMATION

Electric Arc Exposure Test Report

Test Description

The test standard requires that the finished garment be exposed to a level at least equal to the arc rating (ATPV or Ebt) of the fabric or system. The garment is placed on a FR fiberglass mannequin. The mannequin is placed on the text fixture at suitable location and distance as indicated in the test standard. Following the arc exposure, the garment is examined. Areas of particular interest are seems, integrity of the closure (buttons, Velcro® fastener or zipper), overlap of important areas, reflective trim if applied and the embroidery or logos or other accessories. The front area is examined for evidence of arc energy that may enter and expose the under-layers. A lightweight undergarment may be used to provide a heat sensitive indicator which is used to help in the evaluation of thermal energy through the closures or interface.

- Test Parameters: Arc Gap= 30 cm, Distance to the arc = 30 cm,
- Arc current = 8 kA rms,

The following test data was recorded for each trial:

- Arc exposure electrical conditions: arc trial number, arc current, arc voltage, arc duration, energy dissipated in arc, incident energy.
- Review of garment by qualified observer (see attached observation form)
- Photographs of garment before and after arc exposure.
- Video of arc exposure.

Results and Observations

The details of the garment and observations are attached on the following garment evaluation form. These were completed at the time of the test. The subjective evaluation of the garment is to document garment design or material response concerns that may lower the protection level of the fabric in an arc flash incident. The test observations are performed by a qualified observer that has knowledge of behavior of textiles in an arc exposure and in depth knowledge of arc testing specifications and requirements.

Quality Management

Kinectrics' Quality Management System is registered to ISO 9001:2008 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, all work at Kinectrics is performed to meet the requirements of ISO 9001:2008.

Note about this report

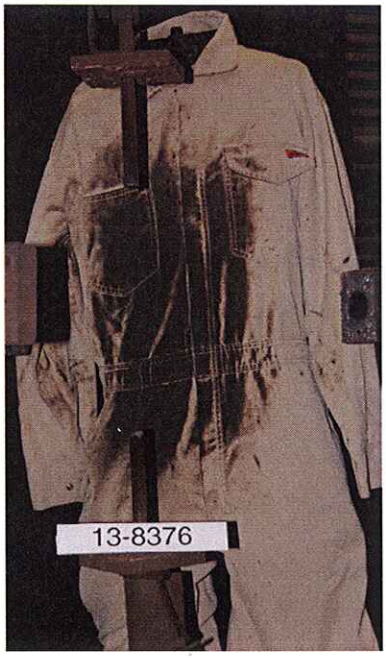
- The test performed does not apply to electrical contact or electrical shock hazard
- The test result is applicable only to the Test Item, other material or color may have a different response.
- The findings of this report are based on the current test method as described in the Reference Standard
- It is assumed that the information supplied by the client was valid and complete

KINECTRICS

Photograph(s) of garment

Before test

After test



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Date Received: November 08, 2013

Date Tested: November 19, 2013 Kinectrics w/o: K-418608-1311T03
Kinectrics Test Station Operator: Daniel Ferguson

The following person is considered a qualified observer to make the evaluation and statement regarding the design and integrity of the garment following the arc exposure:

Test Standard	IEC 61482-1-1 Method B-2009
Style, Model, Ref #	100
Description:	Khaki Coverall
Manufacturer	N/A
Fabric System Rating	ATPV = 8.9 cal/cm² 1311P06
Garment Label Rating	N/A
Number fabric layers:	1
Laundered:	Garment was washed five times by ArcWear.
Reflective trim:	N/A
Other trim or accessories	Tag on front pocket
Pocket and location:	Four Front and Two Back
Closure(s)	Zipper and Covered Snaps
Any non-FR components	N/A
Fabric description:	DuPont do Brasil S/A, Coverall, Style 100, Fabric: DuPont Nomex MHP, 7.0 oz/yd² 237 g/m² 2x1 Twill, 34% Aramid 33% Lyocell 31% Modacrylic 2% Carbon Antistatic, Khaki, ArcWear# 1311T03

Recorded by (sign): Hugh Hoagland Digitally signed by Hugh Hoagland Date: 2013.11.22 15:16:53 -05'00' Name: Hugh Hoagland

Observations

General garment	Shot # 13-8376B	Shot #	
	11.5 cal/cm²		
Break-open through the garment *(Y/N, Area & Size)*	N		
Number layers with ablation *(multi-layer only)*	0		
Afterflame (sec) and location:	0		
Ignition of any component *(Y/N)*	N		
Melting & dripping *(Y/N & area)*	N		
Shrinkage *(none, slight, moderate, major)*	None		
Closure(s)			
Closure operable *Y/N*	Y		
Failure of Closure *Y/N*	N		
Indicator Fabric			
Used in evaluation *Y/N*	Y		
Indicator Fabric Type	4.5 oz Cotton		
Ignition Otherwise, put None	N		
General			
Comment			

Summary of Observations:
Based on the results and observations, there are no apparent inconsistencies with the response of the fabric or concerns with the integrity of the garment.

Recorded by (sign): Hugh Hoagland Digitally signed by Hugh Hoagland Date: 2013.11.22 15:17:06 -05'00' Name: Hugh Hoagland