HOT SHIELD USA BUILT WITH CARBON X

SETTING A NEW STANDARD IN FIREFIGHTER PROTECTIVE GEAR

No facial protective gear delivers better protection against flame, heat, smoke, and ash than a Hot Shield face mask or helmet shroud constructed of CarbonX® fabric. And we've got the data to prove it. Competing products may *meet* "No Melt, No Drip" requirements for protective clothing, but our products *exceed* those standards and go above the norm in providing a persistent thermal barrier with minimal heat conductivity.

CARBONX TESTING DATA

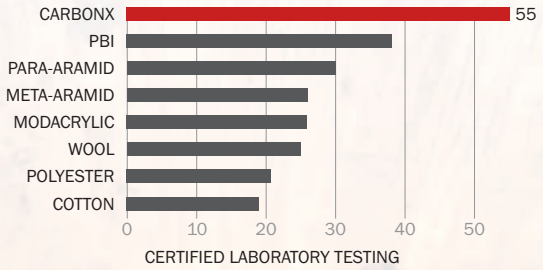
Test Name	Standard	NFPA 1977 (2011) Requirement	Fabric: CarbonX RST-75	Fabric: CarbonX C-59
Radiant Protective Performance (RPP)	ASTM F1939	7 cal/cm^2 or greater	Combination: 11.1 cal/cm^2	Combination: 11.1 cal/cm^2
Thermal Protective Performance (TPP)	ISO 17492	NFPA 2112: 3.0 cal/cm^2 (spaced TPP of 6.0 cal/cm^2)	Single layer: 9.7 cal/cm^2	Single layer: 10.2 cal/cm^2
Flame Resistance (Vertical Flame Test)	ASTM D6413	4" or less of char length; 2.0 seconds or less of after flame; no melt no drip	Pass (0, 0, 0)	Pass (1", 0, 0)
Heat Shrink Resistance	None referenced	Less than 10% in any direction	Pass (–4.3%, –1.5%)	Pass (–3.4%, –1.6%)
Cleaning/Shrinkage Resistance	AATC 135, Machine Cycle I, Wash Temp IV, Drying Aiii	Shrinkage less than 5%	Pass (–3.8%, –2.9%)	Pass (–3.1%, –1.5%)
Seam Breaking Test	ASTM 1683	No minimum	51.5 / 47.3 lbf	66.18 / 53.8 lbf

RADIANT PROTECTIVE PERFORMANCE (RPP)

CarbonX far outperforms the accepted minimum score of 7 cal/cm^2 for RPP, which is a measurement of a fabric's thermal insulating performance against radiant heat. The higher the RPP rating, the higher the level of protection. Hot Shield face masks have a RPP rating of 11 cal/cm^2. (See certified test results at the end of this document.)

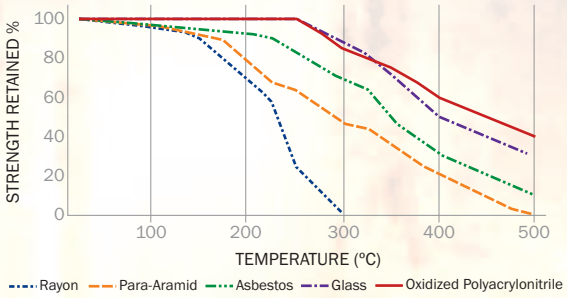
LIMITING OXYGEN INDEX

The Limiting Oxygen Index measures the amount of oxygen required in the environment for a fabric to support combustion. Any material with a LOI less than 20.95 (the oxygen volume of air) will burn in air. The CarbonX patented fiber blend has a LOI rating of 55, indicating it requires an oxygen level of nearly three times that of air to burn. When exposed to intense heat or flame, CarbonX fibers carbonize and then expand, eliminating any oxygen content within the fabric.



STRENGTH RETENTION

After intense exposure to 250°C heat, the CarbonX fiber blend possesses 100 percent of its original strength. Turning up the heat to 500°C, the CarbonX fiber blend retains an astonishing 40 percent of its strength, even after 10 minutes of exposure.



The Govmark Organization, Inc.

96-D Allen Boulevard
Farmingdale, New York 11735-5626 USA
Tel. +1 (631) 293-8944 Fax +1 (631) 293-8956
e-mail: info@govmark.com

Received:05/09/2012	Completed:05/30/2012	Letter: N	rb	P.O.#:	Test Report #:	2-92224-0-

Client's Identification	Layup-Outer Layer-RST-75-7.5 OSY Rip Stop Woven (Black) Comprised of OPAN & P-Aramid Fibers/Inner Layer-C59-6.6 OSY Plain Woven (Black) Comprised of OPAN & P-Aramid Fibers (see continuation)

Tested For: **Jake Hirschi**
Chapman Innovations
343 Wets 400 South
Salt Lake City, UT 84101

Key Test: NFPA 1977 (2005) 8.2 550

Tel: 1-(801)-415-0023 **Ext:**
Fax: 1-(801)-415-2001

CLIENT'S IDENTIFICATION (continuation):

End Use of Product: Fabric used in Fire Resistant PPE.

PC: 24H /md

TEST PERFORMED: NFPA 1977 (2005) - Standard on Protective Clothing and Equipment for Wildland Fire Fighting (cites ASTM F 1939 with NFPA 1977 modifications)

SECTION: Chapter 8 Test Methods, Section 8.2 Radiant Protective Performance (RPP)

TESTED: [x] Initially [CODE 550]
[ ] Initially and after 5 launderings per AATCC 135 [CODE 800]

PRODUCT CATEGORY: [x] Garment Textile [ ] Other _____

SPECIMEN: [ ] single layer [x] multi-layer

EXPOSURE ENERGY: 21 kW/m² (0.5 cal/cm²•s)

BRIEF DESCRIPTION OF TEST: The RPP value is based on a theoretical level of thermal protection based on a time vs. heat exposure graph. During the test the product under qualification is positioned vertically between the quartz lamp heat exposure and a sensing calorimeter. The longer it takes for the sensoring calorimeter to heat up, the higher the RPP value. The higher the RPP value, the greater the theoretical exposure before a second degree burn is encountered. It should be noted that this is strictly a laboratory theoretical evaluation and cannot, in any way, identify potential burn injury prevention in an actual real-life fire exposure.

RESULTS:

Specimen #	INITIAL: RPP Value (cal/cm²)	AFTER 5 LAUNDERINGS: RPP Value (cal/cm²)
1	11.7	NT
2	11.0	NT
3	10.6	NT
Avg:	11.1	

ACCEPTANCE CRITERIA: Minimum RPP Value = 7

CONCLUSION: Based on the above Results and Acceptance Criteria, the item tested:

[x] Complies; [ ] Does not comply

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Tel: 1-(801)-415-0023 **Ext:**
Fax: 1-(801)-415-2001

REMARKS: None.

CERTIFICATION: I certify that the above results were obtained after testing specimens in accordance with the procedures and equipment specified by NFPA 1977, 2005 Edition, Section 8.2.

AUTHORIZED SIGNATURE
THE GOVMARK ORGANIZATION, INC. /jb

MAY 31 2012

/gb

MS. PHYLLIS PETTIT

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