

CARBON X CARBONX CR-80 REPEL

CARBONX® CR-80 REPEL™ DELIVERS MULTIFUNCTIONAL PROTECTION UNLIKE ANY OTHER PROTECTIVE FABRIC. CONSTRUCTED TO BE TRULY NON-FLAMMABLE AND LIGHTWEIGHT, CR-80 REPEL PROVIDES MAXIMUM COMFORT WHILE DELIVERING SUPERIOR PROTECTION AGAINST EXTREME HEAT, DIRECT FLAME, MOLTEN METAL, FLAMMABLE LIQUIDS, AND CERTAIN CHEMICALS—ALL IN ONE SINGLE GARMENT.

Sparks and spatter simply roll off CR-80 Repel, making it ideal for use in jackets, removable sleeves, coveralls, aprons, bibs, and spats.

CARBONX CR-80 REPEL—MULTIFUNCTIONAL PROTECTION IN ONE SINGLE FABRIC

CarbonX CR-80 Repel is designed to protect against numerous types of hazards in one single garment, including dangers unique to the welding, molten metal, pulp and paper, and oil and gas industries. With the superior multifunctional protective capabilities of CR-80 Repel, the multiple garments typically required in these harsh environments may be replaced with a single piece of protective clothing constructed of the CR-80 Repel fabric.

CR-80 Repel is made of the patented CarbonX blend of high-performance fibers and a proprietary compound that enables the fabric to remarkably shed molten metal, flammable liquids, and certain chemicals. Sparks, spatter, and splash simply roll off the material. CR-80 Repel is one of the few non-aluminized, flame-resistant (FR) fabrics on the market able to pass the ASTM F955 test for molten iron. Its flammability performance, as measured by the thermal mannequin test, is also extraordinary, with only 15–20% of the mannequin surface reaching criteria for a second- and third-degree burn.

With an encapsulated barrier of silicone, CR-80 Repel also shields against harsh weather conditions, reducing wind penetration and repelling water.

CR-80 Repel is significantly lighter than other similar application protective options. Its lighter weight increases a wearer's comfort and productivity as it decreases the amount of muscle exertion and heat stress that builds up over the course of a work shift. Although CR-80 Repel is water resistant, micropores in the fabric make it breathable, further enhancing comfort.

Constructed to be truly non-flammable, CR-80 Repel delivers:

Unmatched Protection: CR-80 Repel will not burn, melt, or ignite, and greatly outperforms competing products when subjected to direct flame, extreme heat, molten metal, flammable liquids, and certain chemicals. Even after intense heat and flame exposure, CR-80 Repel maintains its strength and integrity and continues to protect. It also limits heat transfer much more effectively than FR fabrics of similar weight.

Comfortable Protection: CR-80 Repel is lightweight, flexible, and odor resistant, and it dries quickly. CarbonX offers a variety of Repel fabric options, depending on the hazard risk.

Permanent Protection: Because CR-80 Repel is inherently flame resistant, its thermal protective properties will not wash out or wear away. Apparel made from CR-80 Repel can be worn again and again, even under conditions of daily exposure, providing significant value to users. As opposed to leather, CR-80 Repel is chromium-free, making it easy to dispose of apparel at the end of its wear life. (Apparel that is torn or damaged should be removed from service.)

SETTING A NEW STANDARD IN FR PROTECTIVE APPAREL

CARBONX

While competitors work to ensure their products meet industry standards, our goal is to exceed those standards and go above the norm in providing a persistent thermal barrier with minimal heat conductivity. CarbonX fabrics and apparel offer protection far beyond the industry's "No Melt, No Drip" requirements, which typically only require that protective fabrics not contribute to burns in a thermal exposure (as opposed to actually protecting the wearer from a thermal event).

TECHNICAL PERFORMANCE

POUR TEST (ASTM F955)

Maximum calorimeter temperature rise during the first 30 seconds and time to second-degree burn after impact with molten iron

	Hazard	Max Temp. Rise (°C) After 30 Seconds		Time to Second-Degree Burn According to Stoll Curve (Seconds)
		Top Cal.	Bottom Cal.	
CR-80 REPEL	Iron	13.4	10.3	None

Average visual rating of outer layer fabric exposed to molten aluminum and iron

	Hazard	Charring	Shrinkage	Adherence	Perforation
CR-80 REPEL	Iron	3 Moderate charring	1 No shrinkage	1 None	1 None

THERMAL MANNEQUIN TEST (ASTM F1930-13)

Garment System	% of mannequin surface reaching criteria for a second- and third-degree burn	% of mannequin surface under garment reaching criteria for a second- and third-degree burn
CR-80 REPEL	20.8	15.0
ASTM F1930-13	50	50

ANTI-STAT (EN 1149-2, Electrical Resistance)

Pass (Class 1 and 2)

WELDING SPLATTER (EN ISO 11611, Clause 6.8, Impact of Spatter)

Pass (Class 1 and 2)

CHEMICAL RESISTANCE (ASTM F739-12 for Permeation of Liquids and Gases, Time to Permeation)

ASTM F739-12	15 minutes		
Hydrogen Peroxide 30%	21.6 minutes	Sodium Chlorate	> 480 minutes
Black Liquor	> 480 minutes	Sodium Hydroxide 50%	> 480 minutes
Green Liquor	242 minutes	Sulfuric Acid 93%	36.3 minutes
		White Liquor	60.7 minutes

DEMONSTRABLY SUPERIOR

CarbonX partners with leading safety manufacturers and distributors to deliver customized, non-flammable personal protective equipment (PPE) solutions for the world's most hazardous environments. When confronting these dangerous conditions, professionals and enthusiasts can rely on CarbonX to provide them with the protection they deserve.

FOR MORE INFORMATION ABOUT CARBONX FABRICS AND APPAREL, CALL 801-415-0025 OR VISIT WWW.CARBONX.COM.

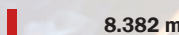
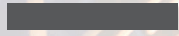

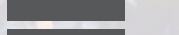

CARBONX CR-80 REPEL PROPERTIES

TOTAL WEIGHT (OZ/YD ²)	9.5 OZ
NFPA 70E HAZARD RISK CATEGORY	2

AFTER FLAME

CR-80 REPEL	None/0 seconds
ASTM F1506	2 seconds or less
NFPA 1971 (2007)	2 seconds or less
NFPA 1975 (2009)	2 seconds or less
NFPA 1977 (2005)	2 seconds or less
NFPA 2112 (2007)	2 seconds or less

CHAR LENGTH

CR-80 REPEL		8.382 mm (0.33")
ASTM F1506		6" or less
NFPA 1975 (2009)		6" or less
NFPA 1977 (2005)		4" or less
NFPA 2112 (2007)		4" or less

THERMAL PROTECTIVE PERFORMANCE (TPP) (cal/cm²)

CR-80 REPEL		7.8
ASTM F1506		3.0 (spaced TPP of 6.0)

ATPV (cal/cm²)

CR-80 REPEL		8.6
NFPA 70E HRC 2		8.0

ASTM F1506: Standard performance specification for FR textiles in apparel worn by electrical workers exposed to momentary electric arc and related thermal hazards.

NFPA 1971 (2007): Standard on protective ensembles for structural firefighting and proximity firefighting.

NFPA 1975 (2009): Standard on station/work uniforms for emergency services.

NFPA 1977 (2005): Standard on protective clothing and equipment for wildland firefighting.

NFPA 2112 (2007): Standard on FR garments for protection of industrial personnel against flash fire.

Thermal Protective Performance (TPP): The TPP score is simply two times the number of seconds it takes for a second-degree burn to occur when exposed to a 2.0 cal/cm² flame. The higher the TPP rating, the higher the level of protection.

ATPV: ATPV is defined in the ASTM F1959-99 standard arc test method for FR fabrics as the incident energy that would cause the onset of a second-degree burn (1.2 cal/cm²).