CARBONX REPEL™

PROFESSIONALS WORKING WITH MOLTEN METAL, PETROCHEMICALS, AND OTHER HOT/FLAMMABLE LIQUIDS ROUTINELY FACE THREE CHALLENGES IN CHOOSING FLAME-RESISTANT (FR) PROTECTIVE APPAREL—PROTECTION, DURABILITY, AND COMFORT. CARBONX® REPEL™ HAS PROVEN TO BE THE BEST, IF NOT THE ONLY SOLUTION ON THE MARKET TO OVERCOME ALL THREE OF THESE CHALLENGES.

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

CARBONX REPEL—SHEDS MOLTEN METAL, PETROCHEMICALS, AND HOT OR FLAMMABLE LIQUIDS LIKE NO OTHER FABRIC

Constructed using advanced patented technology, CarbonX Repel provides an extraordinary level of protection and durability. Repel is made of the patented CarbonX blend of high-performance fibers and a proprietary compound that enables the fabric to remarkably shed spatter, sparks, and other hot liquids and molten metal. Repel is perhaps the only non-aluminized FR fabric able to pass the ASTM F955 pour test for both molten iron and aluminum.

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

Repel is up to 60 percent lighter than most leathers and other primary protection options currently in use. This 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 it is water resistant, micropores in the fabric make it breathable, further enhancing comfort.

Inherently flame resistant, Repel delivers:

Unmatched Protection: It will not burn, melt, or ignite, and significantly outperforms other FR products when subjected to direct flame, extreme heat, molten metal, petrochemicals, hot/flammable liquids, or arc flash. Even after intense exposure, Repel maintains its strength and integrity and continues to protect. It also limits heat transfer much more effectively than other FR fabrics of similar weight.

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

Permanent Protection: Because Repel is inherently flame resistant, its thermal protective properties will not wash out or wear away. Apparel made from Repel can be worn again and again, even under conditions of daily exposure, providing significant value to users. And, as opposed to leather, 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

CARBON X

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—ASTM F955 POUR TEST RESULTS

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

	Hazard	Max Temp. Rise (°C) After 30 Seconds		Time to Second-Degree Burn According to Stoll Curve (Seconds)
		Top Cal.	Bottom Cal.	
REPEL/C-59si	Aluminum	17.1	11.9	None
REPEL/C-59si	Iron	10.3	12.8	None

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

	Hazard	Charring	Shrinkage	Adherence	Perforation
REPEL/ C-59si	Aluminum	2 Slight charring	1 No shrinkage	1 None	1 None
REPEL/ C-59si	Iron	3 Moderate charring	1 No shrinkage	1 None	1 None

Evaluated visually for:

- Extent of charring. Five grades ranging from 1=slight scorching, fabric had small brown areas to 5=severely charred, large holes or cracks, very brittle.
- Shrinkage or the extent of fabric wrinkling around the splash area. Five categories ranging from 1=no shrinkage to 5=extensive shrinkage.
- Adherence or amount of metal sticking to the front of the fabric. Five categories ranging from 1=none to 5=large amount of adherence of metal to the fabric.
- Perforation or the extent of the destruction of the fabric, usually detected by holding it up to a light. Five grades ranging from 1=none to 5=heavy perforation, the fabric exhibited gaping holes or large cracks or substantial metal penetration to the back side.

ASTM F955 Pour Test: The standard test method for evaluating heat transfer through materials for protective clothing upon contact with molten substances.

DEMONSTRABLY SUPERIOR

CarbonX fabrics and apparel deliver better ounce-for-ounce protection against direct flame, molten metal, hot/flammable liquids, arc flash, and extreme heat than competitive products. Every day, professionals and enthusiasts who work and play in some of the world's most hazardous environments 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.

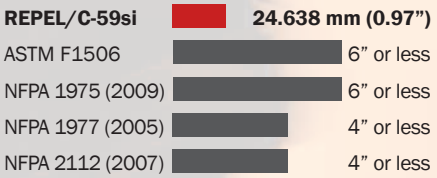
CARBONX REPEL PROPERTIES

TOTAL WEIGHT (OZ/YD^2)	8.5 OZ
NFPA 70E HAZARD RISK CATEGORY	2

AFTER FLAME

REPEL/C-59si	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



THERMAL PROTECTIVE PERFORMANCE (TPP)

ATPV

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 fire fighting and proximity fire fighting.
NFPA 1975 (2009): Standard on station/work uniforms for emergency services.
NFPA 1977 (2005): Standard on protective clothing and equipment for wildland fire fighting.
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/cm^2 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/cm^2).