

CARBON



ALUMINIZED SOLUTIONS

THERE IS A COMMON PERCEPTION AMONG PROFESSIONALS WORKING IN MOLTEN-METAL AND HIGH-HEAT ENVIRONMENTS THAT ALUMINIZED PROTECTIVE APPAREL MUST BE HEAVY AND RIGID IN ORDER TO ADEQUATELY PROTECT AGAINST BOTH RADIANT HEAT AND MOLTEN METAL SPLASH. LIGHTER-WEIGHT ALTERNATIVES ARE REGARDED FOR RADIANT HEAT PROTECTION ALONE AND PROVIDE LITTLE RESISTANCE TO MOLTEN SPLASH HAZARDS.

CONSIDERING ALUMINIZED GARMENTS ARE USUALLY WORN IN ENVIRONMENTS WHERE AMBIENT TEMPERATURES CAN EXCEED 200°F, THE USE OF HEAVY, RIGID APPAREL MAY POSE SERIOUS RISKS TO THE WEARER'S SAFETY AND PRODUCTIVITY. ADDED WEIGHT COMBINED WITH RESTRICTED MOVEMENT CAN CAUSE THE WEARER TO EXPEND MORE ENERGY IN DOING HIS OR HER JOB, THEREBY INCREASING THE POTENTIAL FOR HEAT-STRESS RELATED INJURIES WHILE REDUCING PRODUCTIVITY.

CARBONX WITH Z-FLEX ALUMINIZATION DEFIES THESE PERCEPTIONS AND REALITIES.

Applications for CarbonX With Z-Flex Aluminization: coats, jackets, hoods, full-body suits, pants, leggings, and overshoes/spats.

NEWTEX

CARBONX WITH Z-FLEX ALUMINIZATION IS LIGHTWEIGHT, YET OFFERS MAXIMUM PROTECTION AND ENHANCED COMFORT

CarbonX® With Z-Flex® Aluminization enhances both protection and comfort for individuals working in molten-metal and high-heat environments. CarbonX aluminized fabrics are flexible and lightweight, yet still provide maximum temperature resistance, extraordinary protection against molten metal splash, and superior comfort.

CarbonX aluminized fabrics incorporate the Newtex® proprietary Z-Flex MLA™ process, or multilayer aluminization, which delivers outstanding reflectivity, durability, and flex-bond. Up to 95% of radiant heat can be reflected when CarbonX With Z-Flex Aluminization is deployed properly, with no organic flame contribution.

Upon contact with certain molten substances, the aluminized coating will melt away; however, the high-performance CarbonX base fabric will continue to protect and provide a persistent barrier. CarbonX aluminized fabrics are among the lightest materials on the market able to pass the ASTM F955 pour test for both molten iron and aluminum. They have remarkable abilities to shed spatter, sparks, and other hot liquids and molten metal and to withstand extremely high temperatures.

Constructed to be truly non-flammable, CarbonX With Z-Flex Aluminization delivers:

Unmatched Protection: The base fabric will not burn, melt, or ignite, and significantly outperforms competing fabrics when subjected to extreme heat and molten metal splash. Even after intense exposure, the fabric maintains its strength and integrity and continues to protect. It also limits heat transfer much more effectively than other aluminized products of similar weight, and Z-Flex Aluminization has been proven to deliver up to two times the radiant reflective protection of the leading competitor in extreme conditions.

Comfortable Protection: The base fabric maintains its flexibility even after it is aluminized and is soft-to-the-touch, enhancing the wearer's comfort and productivity.

Permanent Protection: Because the fabric is inherently flame resistant, its thermal protective properties will not wear away. Proper care and cleaning will extend the life of garments made from the fabric. (Apparel that is torn or damaged should be removed from service.)



SETTING A NEW STANDARD IN FR PROTECTIVE APPAREL

CARBON



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 iron.

	Baselayer	Max Temp. Rise (°C) After 30 Seconds		Time to Second-Degree Burn According to Stoll Curve (Seconds)
		Top Cal.	Bottom Cal.	
CarbonX Fleece With Z-Flex Aluminization	Cotton T-Shirt	15.3	8.3	None
CarbonX Fleece With Z-Flex Aluminization	CarbonX Ultimate™ Fabric	11.7	8.6	None
CarbonX CR-80 With Z-Flex Aluminization	Cotton T-Shirt	15.8	13.2	None

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

Average visual rating of outer layer fabric exposed to molten iron

	Baselayer	Charring	Shrinkage	Adherence	Perforation
CarbonX Fleece With Z-Flex Aluminization	Cotton T-Shirt	3 Moderate charring*	1 No shrinkage	1 None	1 None
CarbonX Fleece With Z-Flex Aluminization	CarbonX Ultimate™ Fabric	3 Moderate charring*	1 No shrinkage	1 None	1 None
CarbonX CR-80 With Z-Flex Aluminization	Cotton T-Shirt	3 Moderate charring*	1.5 No shrinkage	1 None	1 None

*Fabric was mostly black in impacted area. Evaluated visually on a scale of 1–5, with 1=none and 5=significant charring, shrinkage, adherence, or perforation.

CarbonX Fleece With Z-Flex Aluminization passes all requirements of EN ISO 11612

ISO 17493@180°C Heat Resistance	–1.6%	ISO 9151 Convective Heat	B1
ISO 17493@260°C Heat Resistance	–2.2%	ISO 6942 Radiant Heat	C3
ISO 15025-A Flame Spread Face	A1	ISO 9185 Molten Aluminum	D3
ISO 15025-B Flame Spread Edge	A2	ISO 9185 Molten Iron	E3
ISO 13928-1 Burst Strength kPa	1345	ISO 12127 Contact Heat	F1
ISO 13937-2 Tear Strength	38N 58N		

EN ISO 11612 (2008): European standard for protective clothing designed to defend against heat and flame. European standard testing is not currently available for CarbonX CR-80 With Z-Flex Aluminization.

CarbonX partners with leading safety supply distributors to deliver customized, non-flammable personal protective equipment (PPE) solutions for the world's most hazardous environments. CarbonX is used in protective applications for industrial safety, construction, welding, molten metal, utilities, pulp and paper, oil and gas, firefighting, motorsports, and tactical/police.

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

CARBONX FLEECE WITH Z-FLEX

ALUMINIZATION

TOTAL WEIGHT (OZ/YD²) 12.0 OZ

TOTAL WEIGHT (G/M²) 410 G/M²

CARBONX CR-80 WITH Z-FLEX

ALUMINIZATION

TOTAL WEIGHT (OZ/YD²) 9.5 OZ

Multilayer Z-Flex Aluminization

MULTIPLE LAYERS OF ALUMINUM, PROTECTIVE FILMS, AND HEAT-STABLE ADHESIVES SO IF ONE LAYER BREAKS DOWN, ANOTHER LAYER IS THERE TO PROTECT.

