



Radiation Shield Technologies

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www.RadShield.com

RST 
Radiation Shield Technologies

A New Protection Breakthrough Against CBRNe



DEMIRON[®] by **RST** 

ISO 9001
ISO 13485
ISO 8194
CERTIFIED



A New Protection Breakthrough

Radiation Shield Technologies is a global leader in multi-hazard universal protective apparel. **RST®** has developed **Demron™**, a patented nano-composite that offers unique protection against chemical, biological, radiological, nuclear, and ballistic (CBRNE) threats. Additionally, because of its thermoconductive capabilities, it is self-cooling and reduces IR detection.

With an ever-increasing risk of biological, chemical, radiological, nuclear, heat, and ballistic threats there is an obvious need to provide military and first responder personnel with universal multi-hazard protection. Current PPE's such as CBRNe suits only provide BC protection and because they are thermo-insulators they also trap heat and cannot be externally cooled. Ballistic vests and shields also provide no protection against ionizing gamma radiation, produce significant heat stress, and offer no reduction in IR surveillance detection.

Demron™ is unique in that it is the only CBRNe Class 2 Style PPE multi-hazard fabric that offers protection against ionizing gamma radiation, reduces heat stress, is anti-ballistic, and attenuates heat signatures for IR detection reduction. **Demron™** is flexible, light weight, tear resistant, splash resistant and has the feel and coolness of liquid metal. It does not lose its effectiveness when exposed to liquids and salts, has a long shelf life, and is re-usable.

Our current line of products includes a full body CBRNe class 2 style, level B suit, high energy Radiologic/Nuclear ballistic suppression blankets, tactical anti-nuclear/ radiological vests, and we have nearly completed the development of a IIIa ballistic vest that has anti-radiation protection, passive cooling, and IR detection reduction for stealth operations and friendly fire reduction risk.

DEMIRON™

W CBRN ENSEMBLE

The Only True Anti-Nuclear, CBRN Now with Self-Cooling Stealth Technology

The only CBRN multi-hazard suit with true anti-nuclear protection.

Demron™ is the only CBRN fabric that offers true resistance against Radiological and Ionizing Nuclear Radiation.

The Demron™ Radiation Protection Suit was engineered to provide universal protection against chemical, biological, non-ionizing radiation, and ionizing radiation. Demron™ reduces heat stress by allowing better heat dissipation than any other impermeables. According to Lawrence Livermore National Defense Laboratory, the suit is an excellent shield of high energy beta particles, such as those emitted from Strontium-90, and provides at least 50% shielding of gamma rays up to 130 Kev.

Other BC suits are heat sinks. With very little activity, heat will build up in the suit and it will continue to climb at rest. Because they are insulating, they cannot be cooled externally. Only the Demron™ suit reduces heat stress production, passively cools, and the first responder can be externally cooled without the need to be de-gowned.



Demron™ Full Body CBRN Tactical Suit



Source	Type	Energies	Dose Reduction (%)
50 kvp	X-ray	50 kv	≥ 75%
75 kvp	X-ray	75 kv	≥ 60%
100 kvp	X-ray	100 kv	≥ 60%
²⁴¹ Am	Gamma (γ)	4.9% 20.8 KeV	≥ 85%
		13.3% 13.9 KeV	
		19.3% 17.8 KeV	
		35.7% 59.54 KeV	
¹⁰⁹ Cd	Gamma (γ)	22 KeV Major	≥ 91%
		88 KeV Minor	
¹³⁷ Cs	Gamma (γ)	0.662 MeV	~1%
⁶⁰ Co	Gamma (γ)	1.173 MeV	≤ 1%
		1.332 MeV	
⁹⁰ Sr/ ⁹⁰ Y	Beta (β)	546 KeV (sr)	75%
		2.27 MeV (y)	

Standard Features:

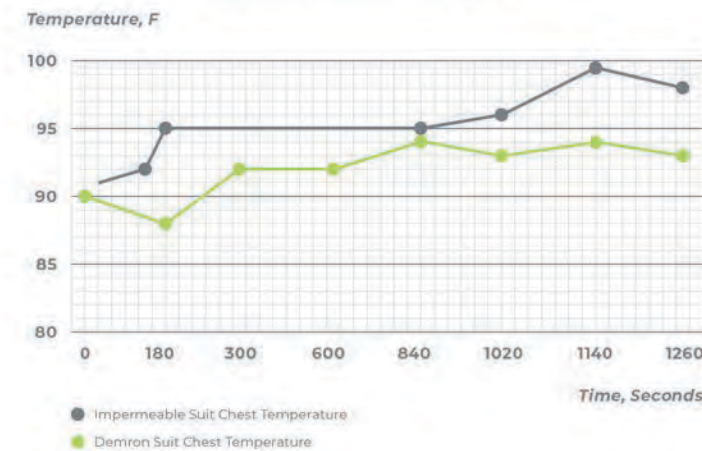
- Full chemical and biological resistance
- CBRN heat sealed seams
- CBRN zipper
- Self-cooling
- Reduces IR detection
- Built-in booties and gloves
- CBRN face seal

Options and Accessories:

- CBRN mask, gloves and boots

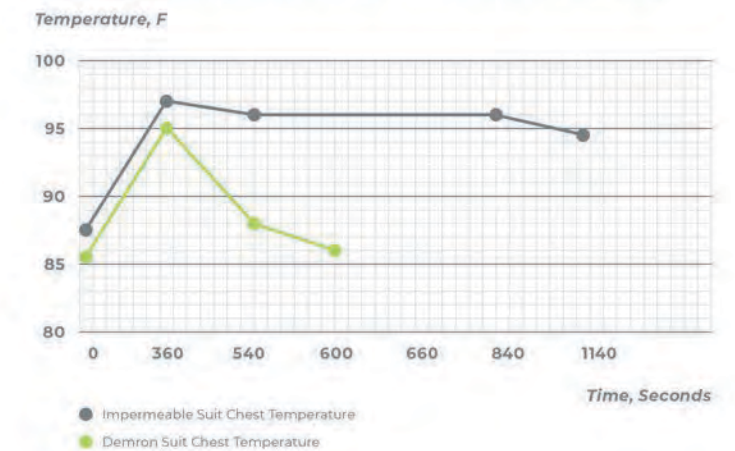
Full Body Suit Heat Stress Temperature Comparison

Each suit was worn on a treadmill at 3.5 mph for 10 min (600sec) and allowed to passively cool at amb T



Full Body Suit Showing Active External Cooling Capability Comparison

Each suit was worn on a treadmill at 3.5 mph for 3 min and then actively cooled with a wet t-shirt and fanned at 25 mph. The water temp on t-shirt was 74 F.



DEMIRON™

FULL BODY SUIT

The Only True Anti-Nuclear, CBRN Now with Self-Cooling Stealth Technology

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Other BC suits are heat sinks. With very little activity, heat will build up in the suit and it will continue to climb at rest. Because they are insulating, they cannot be cooled externally. Only the Demron™ suit reduces heat stress production, passively cools, and the first responder can be externally cooled without the need to be de-gowned.



Demron™ Full Body CBRN Tactical Suit

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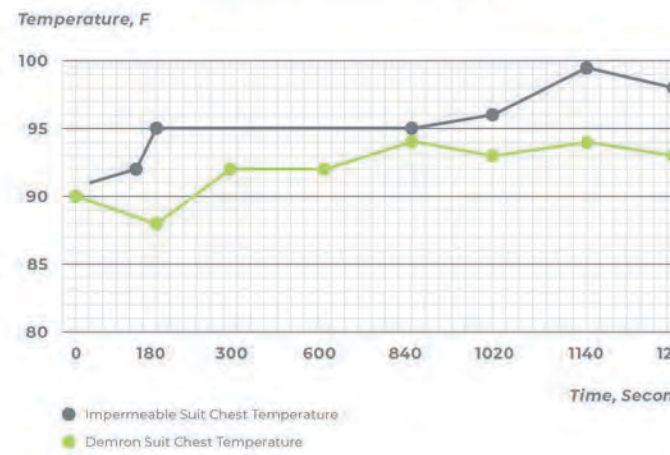
- Full chemical and biological resistance
- CBRN heat sealed seams
- Self-cooling
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Options and Accessories:

- CBRN mask, gloves and boots

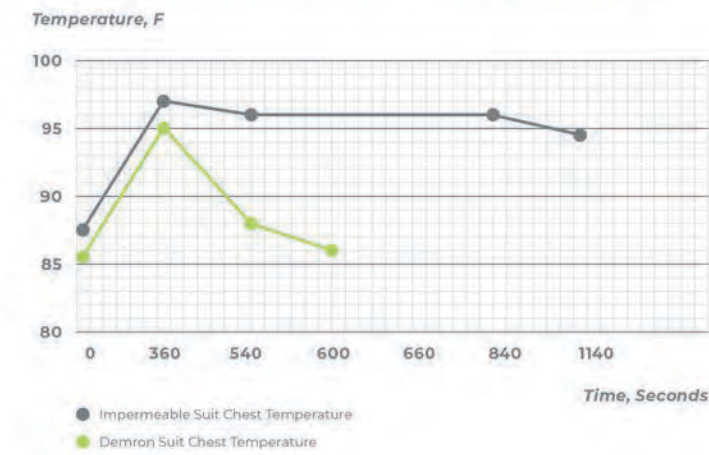
Full Body Suit Heat Stress Temperature Comparison

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Full Body Suit Showing Active External Cooling Capability Comparison

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DEMIRON™ ICE

Superior Heat Stress Mitigation and Management

With patented self-cooling fabric provides highest protection from viral, biological, chemical threats and heat stress

Most suits that are worn to protect against EBOLA and ZIKA Virus exposure hazards trap heat and vapor in the suit creating significant and potentially life threatening heat stress. **Demron™ ICE** is thermo conductive, and a passive cooling system. The reduced heat stress translates to extended operational times and maximum comfort for the wearer.

Just as heat release is critical to maintaining an operational core temperature, the ability to proactively combat heat stress is paramount. **Demron™ ICE** fabric has metal properties that promote passive cooling and make it possible to cool the wearer by external means. The application of wet towel or ice pack can dramatically heighten the wearer's mental state and physical ability to work longer hours.

The **Demron™ ICE** material is rugged, durable, and engineered to withstand constant use. Prospective decontamination procedures and agents will not degrade the material during the doffing process. Resistant to tearing, **Demron™ ICE** fabric exceeds all CDC tensile strength recommendations.



Standard Features:

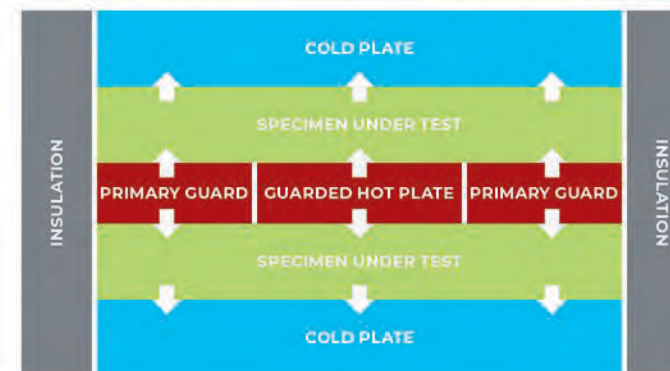
- Standard full body suit with integrated hood

Options and Accessories:

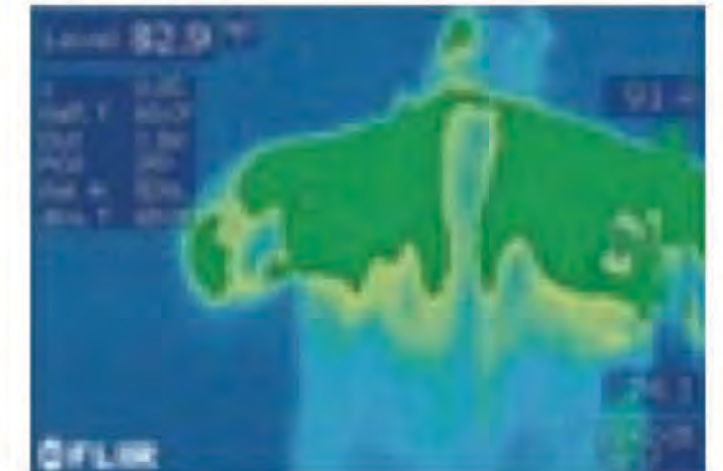
- Glove system: Ultra barrier inner glove attached to suit
- Footwear system: Sock-like bootie extensions attached to suit
- Integrated Class 2 hood face seal

Idealized heat flow in a bidirectional guarded hot plate apparatus

Two identical specimens are needed for one test



Heat flow direction indicators



FLIR thermal imaging camera shows heat being transferred to the thermally conductive **Demron™ ICE** suit and being released into the atmosphere.



DEMIRON™ RADIATION TORSO VEST

Shield Yourself with the New and Advanced Cool Stealth Technology

Demron™ Radiation Torso Vest now with cool stealth technology.

The Demron™ Radiation self-cooling vest provides pure gamma reduction and self cooling to the first responder in a radiological event. The vest can be added to any BC suit to also provide true CBRN protection. Demron's Cool Stealth Technology also reduces IR detection for stealth operations.



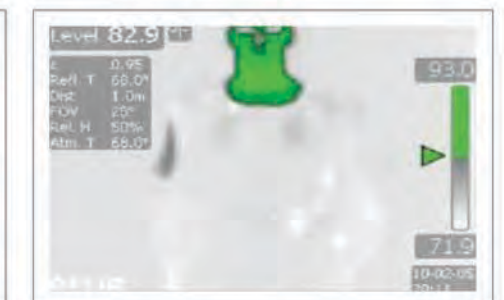
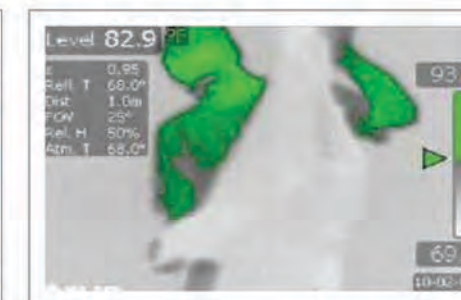
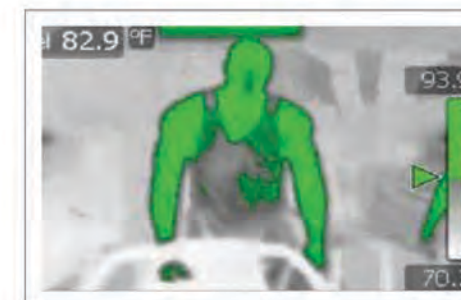
Demron™ Full Body CBRN Tactical Suit



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		88 KeV Minor	
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⁶⁰ Co	Gamma (γ)	1.173 MeV	≤ 1%
		1.332 MeV	
⁹⁰ Sr/ ⁹⁰ Y	Beta (β)	546 KeV (sr)	75%
		2.27 MeV (y)	

Standard Features:

- 360 degree torso and groin coverage against gamma radiation
- Adjustable waist to fit any size
- Self cooling for increased sustainability
- Provides shielding to vital organs
- Poncho design allows for rapid deployment
- Specific molecular engineering provides protection against X-ray and low energy Gamma emissions
- Vest ensemble includes a removable thyroid protector
- Reduces IR detection for stealth operations
- Can be combined with standard BC suits to provide nuclear protection

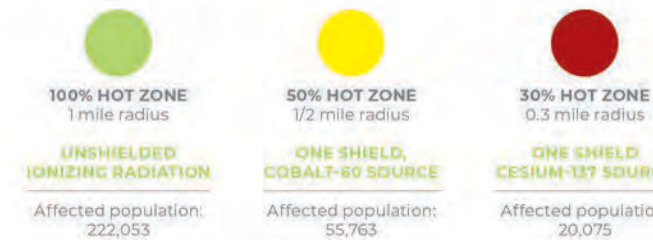
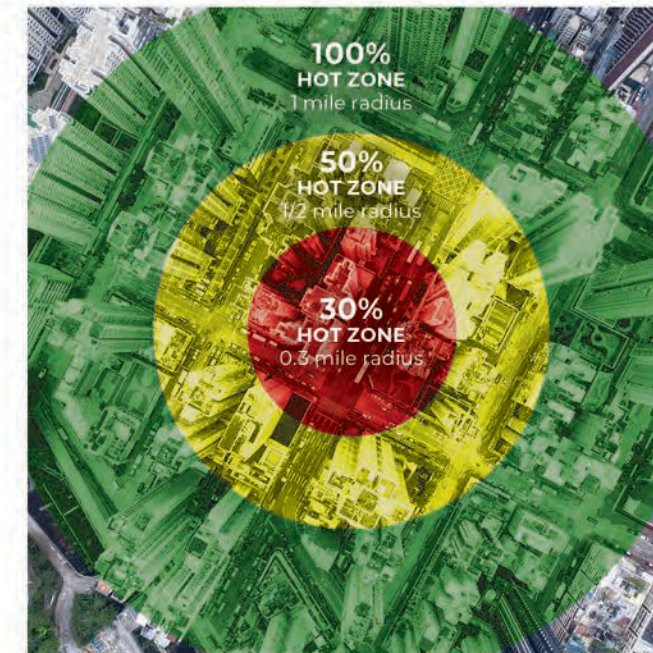


DEMIRON™

IED/RDD/RAD SHIELD BALLISTIC

High Energy Nuclear / Ballistic IED RDD Shield

Reducing the area of radiation is one of the most effective means of radiation protection. Radiological Dispersion Devices (RDD) or dirty bombs, if left unshielded, can emit radiation to a large area of the population. In this scenario, a large amount of radioactive material (ie Cesium 137 or Cobalt 60) is emitting radiation upwards of one mile. Since area is measured as 3.14 times radius square, with the population density of New York City*, made with **Demron™** nearly 222,940 people can be affected. With only one RST High Energy Nuclear/Ballistic IED RDD Suppression Shield, the radius of radiation can be reduced 50% to 70%; thereby reducing the affected population 75% to 91%. This would have a significant impact by allowing the first responder to conduct rescue operations and allow for a more orderly evacuation. *Assumes density population of 71,000 per square mile.



Source	Type	Energies	Dose Redn (%)	Shield
50 kvp	X-ray	50 kv	≥ 91%	≥ 99%
75 kvp	X-ray	75 kv	≥ 81%	≥ 99%
100 kvp	X-ray	100 kv	≥ 75%	≥ 99%
²⁴¹ Am	Gamma (γ)	4.9% 20.8 KeV 13.3% 13.9 KeV 19.3% 17.8 KeV 35.7% 59.54 KeV	≥ 93%	≥ 99%
¹³⁷ Cs	Gamma (γ)	22 KeV Major 88 KeV Minor	≥ 99%	≥ 99%
⁶⁰ Co	Gamma (γ)	1.173 MeV 1.332 MeV	50% @ 20° 39% @ 30° 46% @ 10° 33% @ 20°	84% @ 20° 75% @ 30° N/A N/A
²²⁶ Ra	Gamma (γ)	186-610 KeV	48% @ 10° 38% @ 20°	72% @ 10° 60% @ 10°
⁹⁰ Sr/ ⁹⁰ Y	Beta (β)	546 KeV (sr) 2.27 MeV (γ)	≥ 99%	≥ 99%

Standard Features:

- Made with **Demron™** fabric tested for effectiveness by several DOE labs
- High Gamma Energy suppression, Cs 137 reduction up to 70%
- Unsurpassed Fragmentation Protection (V50 rating of >5426 ft/s for 2gr, 5234 ft/s for 4gr, >4866 ft/s for 16gr, 3952 ft/s for 17gr, 2721 ft/s for 64gr, and 1979 ft/s 9mm)
- Level IIIA ballistic protection STD 0101.04
- Reduces RF transmission
- Shield can be used as a suppression blanket for IED's, RDD's, and RAD's
- 1000 denter Cordura® outer covering, high-strength abrasion, flame and acid resistant outershell
- Easily deployed in field, handles for ease of use
- Non-ballistic shield also available

Standard Sizes: (Custom sizes available)

- 36" x 30"

Standard Colors:

- Black and red

DEMIRON™

CREW PROTECTION BLANKET

Provides Protection Against X-ray and Low Energy Gamma Emissions

The **Demron™** crew protection blanket provides 2 layers of **Demron™** pure gamma reduction to the first responder in a radiological event. The blanket will protect the first responder from an irradiating patient either from a medical procedure or radiological disaster. The blanket can also be folded several times to provide multiple layers of protection against RDD, RED, or RAD.



Source	Type	Energies	Dose Redn (%)	Blanket
50 kvp	X-ray	50 kv	≥ 91%	≥ 99%
75 kvp	X-ray	75 kv	≥ 81%	≥ 99%
100 kvp	X-ray	100 kv	≥ 75%	≥ 99%
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²²⁶ Ra	Gamma (γ)	186-610 KeV	48% @ 10° 38% @ 20°	72% @ 10° 60% @ 10°
⁹⁰ Sr / ⁹⁰ Y	Beta (β)	546 KeV (sr) 2.27 MeV (γ)	≥ 99%	≥ 99%

Standard Features:

- 2-ply
- 72" x 30"
- Made with self cooling technology to keep patients comfortable
- Specific Molecular engineering provides protection against X-ray and low energy gamma emissions
- Can be folded several times for multiple layers of protection
- Rolls up easily for rapid deployment
- Standard carry case included

