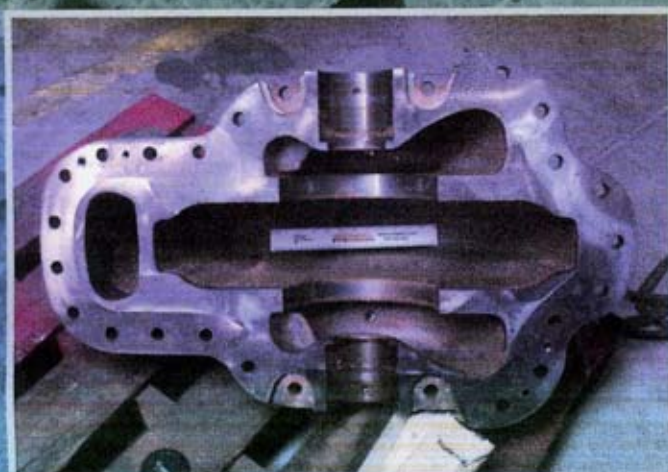


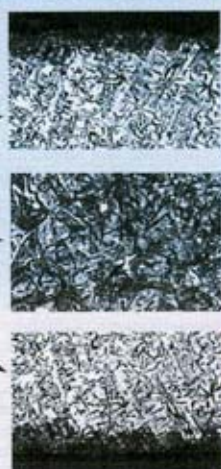


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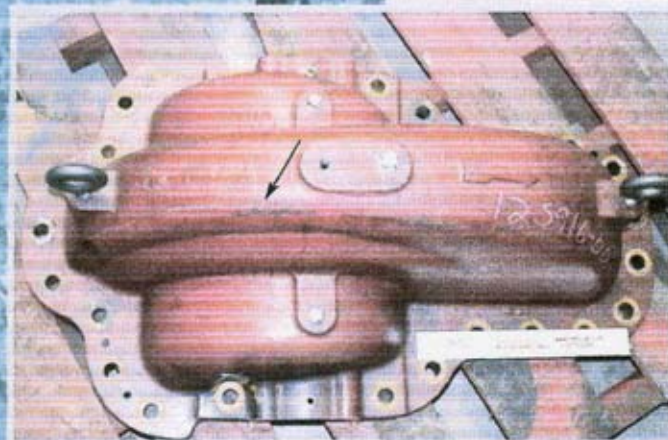
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Sandia Creates Gauntlets to Protect Arms of Soldiers

Researchers at the National Nuclear Security Administration's Sandia National Laboratories have created gauntlets that will aid in saving arms of military personnel riding on Humvees and other military vehicles during combat. The shoulder-length **Sandia Gauntlets** are made of layers of heavy Kevlar—reinforced material used in bulletproof vests and tires—with carbon-composite forearm and upper arm protective inserts.



Airman Garrett Martin demonstrates the Sandia Gauntlet atop a Humvee at Albuquerque's Kirtland Air Force Base. The gauntlet can help save the arms and lives of military personnel riding atop military vehicles during combat operations.
Photo by Randy Montoya

The heat protection characteristics of the Kevlar layers mitigate the thermal effects of warhead blasts on tissue, while the combination of carbon-composite and Kevlar diminishes both blunt trauma effects and penetration or shredding effects of warhead shrapnel on both tissue and

bone, said Jack Jones, project lead and Sandia physical security specialist.

"If the Sandia Gauntlets can protect just one soldier, sailor, airman, or marine from losing an arm, then the effort will be well worth it," said Jones. "This project is very important to our service members and allies who are in harm's way in Iraq and Afghanistan."

Several prototypes were constructed and functionally tested with military personnel in a mission environment. Then gauntlets were shipped to forces in Iraq for recommendations. They were well received there, said Jones. Recommendations for modifications were provided to Sandia, and improvements to the prototypes were made.

Sandia criteria were for a one-size-fits-all design with blunt trauma protection for the hand, wrist, and elbow, as well as heat and blast protection. The primary recommendations from the field tests included straps to hold the gauntlets in place and modifications to the forearm armor to increase flexibility and maneuverability. Army

and Air Force members requested that the Sandia Gauntlets be attached in the rear (left and right sleeve) with a quick-release buckle. This allows wearers to shed the gauntlets after an initial attack if they must fight in a dismounted role, Jones said. Other suggestions included adding a neoprene sleeve inside the forearm to allow for a more secure fit and placing a thumb-hole in the composite to ensure the Sandia Gauntlet rotates and moves with the lower arm.

Several military units have inquired about the gauntlets and would like to know when they will be available for full usage, Jones said.

For more information: Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185-1234; tel: 505/845-9867; fax: 505/844-0001; e-mail: jacjone@sandia.gov; web: www.sandia.gov.

Steel-Belted Reinforcement Product Meets Blast-Resistance Need

The proprietary high-tensile steel reinforcement products of Hardwire, LLC, which are based on steel-belted technology commonly found in tires, have been successfully implemented as solutions for structures and other infrastructure components seeking blast-resistance and blast-mitigation retrofit.



A family of reinforcements from ultrahigh-strength twisted steel wire chords—11 times stronger than a typical steel plate—**Hardwire** provides high strength (up to 8 kips/in.) and high modulus (up to 30 MM psi) in a very thin, ductile envelope. Hardwire and the steel belts in tires are made from the same wire metallurgy. The innovative system uses high-strength steel wires twisted together to form reinforcing steel cords that are twice as strong as the cables holding up the Golden Gate Bridge. Hardwire works well with common construction materials, so it does not require tremendous sophistication or training to use.

In terms of meeting the growing security demands of



Product News

our nation, potential applications of Hardwire include: retrofitting key building structures for shock/explosion resistance; fire-proof retrofitting and strengthening of key buildings and structures; and providing blast-resistant wood products.

For more information: Hardwire, LLC, 1000 Quinn Avenue, Pocomoke City, MD 21851; tel: 410/957-3669; fax: 410/957-3424; web: www.hardwirellc.com.