

DHS Science and Technology Directorate

Improved Structure Firefighting Glove

Current firefighter structure gloves can hamper response efforts

When responding to structural fires, firefighters wear protective gloves known as “structure gloves” to shield their hands from burns and other injuries. Because structure gloves can be bulky and limit dexterity, firefighters often need to remove the gloves to complete routine tasks, such as handling operating tools or using communications equipment. Without gloves, firefighters’ hands are at a higher risk of injury.

In addition to dexterity issues, existing structure gloves can be difficult to put on when wet and offer limited heat protection. In the field, these gloves can be very impractical and slow response time.



Improved Structure Firefighting Glove

New glove with next-generation fabric and design offers better fit and form

The Department of Homeland Security Science and Technology Directorate (S&T) partnered with NanoSonic, Inc. and Shelby Glove to construct a new, improved structure glove that will provide the full range of protection firefighters need. This next-generation glove provides firefighters with enhanced dexterity, water repellency and fire resistance.

NanoSonic has developed a durable material called HybridSil™—a Kevlar®-based fabric that is both heat and water resistant. HybridSil can withstand punctures and lacerations that current structure gloves may not. S&T is working with

NanoSonic to ensure the final glove meets all identified first responder requirements, standards and certifications.

The glove will be tested against National Fire Protection Administration (NFPA) standards regarding safety and heat resistance in April 2014 and is expected to meet all current requirements.

S&T addresses first responders’ needs for reduced risk and increased protection

By improving the structure glove’s technology and materials, S&T ensured firefighters can perform their duties while fully protected. The new material and design allows firefighters to make more precise movements without having to remove their gloves. The improved form and fit and water repellent-features ensure they provide the protection firefighters need.

The project underwent multiple stages of research and testing to ensure the durability of the selected materials in operational field conditions.

To make certain the glove truly met the needs of firefighters, S&T sent each prototype to be tested by fire departments across the nation. Testers used the glove in a series of exercises designed to replicate real life scenarios. Firefighters used the gloves as rigorously during testing as they would in the field. Each iteration featured improvements based on firefighters comments. The current version of the glove was assessed in spring 2014 and evaluated against five categories: ease of donning and doffing, proper fit, puncture resistance, dexterity and thermal protection and heat dissipation.

Gloves expected to hit the market in 2014

After gathering feedback from responders through several rounds of testing, the final specifications for the glove were captured. The finished product will feature three layers of HybridSil™ material.

The Improved Structure Firefighting Glove is expected to be available commercially in 2014.



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To learn more about Improved Structure Firefighting Glove, contact SandTFRG@dhs.gov.