

University Education

BY KATHLYN SWANTKO

Textile Protection Lab

Tests High-Profile Next-Generation Fire Fighting Apparel

A NEW ROLE FOR THE TRADITIONAL FIRE FIGHTER IS UNFOLDING. In a post-9/11 world, with the threat of chemical attacks and pandemics like the H1N1 flu virus, there is a need for the next generation of personal protective equipment for first responders. The next step in safety fabrics needs to, not only shield the fire fighter from fire and heat, but also provide protection from chemical or biological threats.

Since its beginning in 1994, North Carolina State's Textile Protection and Comfort Center (TPACC) has assisted the fire-fighting industry in providing textile research and testing, resulting in recent improvements in protective apparel worn by first responders. Although TPACC is best known for its research in fire fighting protection, the Center has also had other successes. Over the past 15 years, the Center's research has contributed to advancements made in the biological protection of surgical gowns and in chemical protection for HAZMAT outerwear garments.

The TPACC facility is the only one of its kind that is part of a university setting in the United States. Within the past year, a new Man-in-Simulant Test (MIST) laboratory has been added to



Hot Stuff: This type of innovative testing on highly protective suits and gloves helps advance cutting-edge research.

the Center, which allows researchers and students the ability to assess the performance qualities of protective garments against vapors that resemble chemical and biological substances.

Dr. Roger Barker, director of TPACC stated, "Through the new MIST lab, our professional TPACC staff, along with our students, can evaluate all the properties related to protection and comfort, involving increased thermal protection, and chemical and biological protection. And, we can now provide an appraisal of the complete suit, including the fibers, fabrics, and components."

As a result of the MIST research, TPACC has created a high profile fire-fighting suit

that addresses the requirements for fire, chemical, and biological protection. According to Barker, this new suit will be manufactured and made commercially available by Globe Fire Fighting Suits, Pittsfield, New Hampshire.

TPACC has also developed some of the supporting equipment used in its textile analysis. Barker explain, "Through our research, we have developed a testing device for measuring stored energy that can contribute to burns in the material components. In addition, we have even built a 'Pyro-Hand,' a hand-form apparatus for researching fire-protective gloves. This is the first time anyone has had the ability to test whole gloves in a full-scale laboratory simulation of fire exposure."

Going forward, Dr. Barker's goal is to further the research of TPACC. He says, "We have done a good job in applying MIST to projects that are underway. Now, utilizing our MIST lab, we want to undertake further advancements in the areas of chemical and biological protection. We also want to continue our research relating to 'Pyro-Hand' protection for fire fighters, focusing on the fire exposure around the hand form to improve the performance of fire fighting gloves."

Based on current successes, TPACC has established itself as the leader in the advancement of protective apparel for first responders. Through the continued research in its MIST lab, NC State is expected to remain an important source for new developments for the safety and protective market.

Barker notes, "Our Center has been successful in providing a strong academic setting on textile research for our students and staff, besides having a powerful connection to the user needs of the safety and protection industry. We have become the 'go-to' place for this type of research, which has been key to our success."

For more information on "green" composites, contact Dr. Roger Barker at 919-515-6577, or roger_barker@ncsu.edu.

Kathlyn Swantko, president of the FabricLink Network, created TheTechnicalCenter.com for industry networking and marketing of specialty textiles, and FabricLink.com for consumer education about everything fabric. kswantko@fabriclink.com, 818-345-7501.

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