11th Symposium on Performance of Protective Clothing and Equipment: Risk Reduction through Research and Testing

Sponsored by ASTM Committee F23 on Personal Protective Clothing Equipment

June 6-7, 2019
Sheraton Denver Downtown Hotel
Denver, CO

Symposium Co-Chairs: Brian Shiels
ArcWear
Louisville, KY, USA

Karen Lehtonen
Lion First Responder Products, Inc.
Dayton OH, USA

Dr. Bryan Ormond
North Carolina State University
Raleigh, NC, USA

ABOUT THE SYMPOSIUM
The symposium objective is to provide a forum for discussing the current state and future of the Personal Protective Clothing and Equipment Industry.

Specific objectives are to include: showcase current research and advances in personal protective clothing and equipment; define and discuss challenges facing those developing, testing, and using personal protective clothing and equipment; promote communication and information sharing between researchers, manufacturers, users, and government agencies; and, assess the need for new and/or revised standards.
THURSDAY, JUNE 6, 2019

8:00 AM
Welcome and Opening Remarks
Karen Lehtonen, Brian Shiels, and Bryan Ormond, Symposium Co-Chairs

8:10 AM
Welcome to Denver
Jeremy Metz, Division Chief of Emergency Medical Services, West Metro Fire Rescue

SESSION 1: THERMAL HAZARDS
Session Moderator: Doris Burns, Union Pacific Railroad

8:20 AM
Investigation of Lab Scale Tests for Predicting After-Flame and Garment Shrinkage in Protective Garments Exposed to a Fire Simulation

8:50 AM
Extending the Measurement Duration of Copper Disc Calorimeters
R. Burke, Thermetrics

9:10 AM
Development of a Test for Mid-Scale Testing in Fire Scenarios
M. Auerbach, M. Grady, and G. Proulx, U.S. Army Natick Soldier Research, Development and Engineering Center

9:30 AM
Performance of Seams in Protective Fabrics During Arc Exposures
J. Kirby and W. Baitinger, ArcWear

9:50 AM    PANEL DISCUSSION

10:05 AM    BREAK AND POSTER SESSION
SESSION 2: BIOLOGICAL HAZARDS
Session Moderator: Brian Shiels, ArcWear

10:35 AM
L. Portnoff and J. Furlong, CDC/NIOSH/NPPTL

10:55 AM
Measurement for the Effectiveness of Sanitization Processes for Removing or Neutralizing Microbial Contamination from Firefighter Protective Clothing
J. Stull, International Personnel Protection

11:15 AM PANEL DISCUSSION

11:25 AM LUNCH (on your own)

SESSION 3: CLEANING AND DURABILITY
Session Moderator: Bryan Ormond, North Carolina State University

1:00 PM
The Impact of Soiling, Moisture, Abrasion and UV Exposure on NIR Evaluation of In-use Firefighter Protective Clothing
D. Torvi, C. Bespflug, and S. Noble, University of Saskatchewan
C. Vanderschaaf and J. Batcheller, University of Alberta

1:30 PM
Assessing the Durability of Firefighter Protective Hoods Following Simulated On-The-Job Exposures
A. Kasebi, R.B. Ormond, and R.L. Barker, Textile Protection and Comfort Center, North Carolina State University

1:50 PM
Effects of Bleach and Water Conditions in Laundering of Flame and Arc Resistant Clothing Fabrics
S. Klausing, H. Hoagland, J. Kirby, and W. Baitinger, ArcWear

2:10 PM
Compared Response of Seven Different Fire Protective Fabrics to Repeated Launderings
P. Dolez and Y. Malajati, University of Alberta
Validation of Cleaning Procedures for Removing Chemical Contaminants from Fire Fighter Protective Clothing
J. Stull, International Personnel Protection
C. Grant, Fire Protection Research Foundation
J. Tarley, C. Forrester, and L. Greenawald, CDC/NIOSH/NPPTL

3:00 PM PANEL DISCUSSION

3:15 PM BREAK AND POSTER SESSION

SESSION 4: CHEMICAL AND PARTICULATE HAZARDS
Session Moderator: Nick Galloway, Underwriters Laboratory

3:45 PM Evaluation of Respirators for Permeation Resistance against Toxic Industrial Chemicals
J. Allen, R. Iyer, and K. Perrotti, Intertek
J. Stull, International Personnel Protection
P. Klatzman, CTTSO

4:15 PM Evaluating the Performance of Particulate-Blocking Firefighter Hoods
M. McCollum, R.B. Ormond, N. Carlton, and G. Redden, Textile Protection and Comfort Center, North Carolina State University

4:35 PM A Comparison of the Effect of Different Analytical Techniques and Quantitation Limits on Reportable Results in Chemical Permeation Testing
K. Perrotti, G. Townsend, and R. Iyer, Intertek

4:55 PM Evaluation of Inherently Flame-Resistant Nanofiber Nonwovens in Firefighter Protective Clothing
J. Xiang and N. Blackenbeckler, DowDuPont

5:15 PM PANEL DISCUSSION

5:30 PM CLOSING REMARKS

5:35 PM RECEPTION
SESSION 5: HUMAN FACTORS
Session Moderator: Dr Roger Barker, North Carolina State University

8:05 AM
Effect of a Lightweight Structural Firefighter Turnout Composite on Physiological Comfort
M. McQuerry, M. Morrissey, J. Kisiolek, and M. Ormsbee, Florida State University

8:35 AM
Effects of Total Heat Loss versus Evaporative Resistance on Firefighters Suits in a Physiological Heat Strain Trial
E. DenHartog, A.S. Deaton, and M. Matthews, Textile Protection and Comfort Center, North Carolina State University

8:55 AM
Effectiveness of using a Thermal Sweating Manikin Coupled with a Physiological Model to Predict Human Physiological Response to Different Firefighter Turnout Suits

9:15 AM
Wet Thermal Resistance and Drying Time of Selected Clothing Materials
T. Rioux, W. Santee, and X. Xu, USARIEM

9:35 AM PANEL DISCUSSION

9:50 AM BREAK

SESSION 6: PHYSICAL HAZARDS
Session Moderator: Diane Hess, PBI Performance Products

10:05 AM
The Tomodynamometer and You: Challenges in Cut Resistance Testing
A. Funk, Wells Lamont Industrial
SESSION 7: GLOVES AND FOOTWEAR
Session Moderator: Diane Hess, PBI Performance Products

10:35 AM
Building a Better Jungle Combat Boot for Soldiers
C. Robinson and B. Coursey, NIST
J. Stull, International Personnel Protection
B. Ells, Vibram Corporation
A. Adams, U.S. Army Natick Soldier Research, Development and Engineering Center

10:55 PM
Women’s Leather Protective Work Wear Gloves: A Comparative Pilot Study Between 3D Hand Scans, Product Specifications and Sizing
S. Sokolowski, University of Oregon
L. Griffin, University of Minnesota

11:15 PM
A Comprehensive Way to Select Protective Gloves
D. Burns, Union Pacific Railroad

11:35 PM SESSIONS 6/7 COMBINED PANEL DISCUSSION

11:50 PM CLOSING REMARKS

12:00 PM SYMPOSIUM ADJOURNS
POSTERS

Advances in Wildland Fire Shelter Development and Testing
Roger L. Barker, North Carolina State University

Developing Skin Models for the Head and Hand
Margaret Auerbach, U.S. Army Natick

Investigation of Station Wear in Relation to Burn Injury in the United States Fire Service
Meredith McQuerry, Florida State University

The Permeation of Substituted Silanes Through Selected Protective Clothing
Jeffrey Gray, JAG Safety Consulting LLC

How Worn-out is Clean?
Benjamin Hanna, Intertek

Development of Standardized Procedures for Assessing Doffing of Personnel Protective Equipment When Decontaminated
Pam Kavalesky, Intertek

Back of Hand (Dorsal) Impact Protection
Christopher Meadows, D3O

Opportunities for improvement and clarification regarding ASTM standards for moisture vapor transport rate (MVTR) used to evaluate Personal Protective Equipment (PPE)
Alexander Bradley, DuPont Protection Solutions

Investigation of the Influence of Testing Ambient Temperature on Total Heat Loss of Firefighter Turnout Gear Composite
Xiaomeng Fang, North Carolina State University