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

Sponsored by ASTM Committee F23 on Personal Protective Clothing Equipment

January 28-29, 2016
Thursday, 8:00 AM - 5:00 PM
Friday, 8:00 AM – 1:20 PM
Grand Hyatt San Antonio
San Antonio, Texas

Symposium Co-Chairs:
Brian Shiels
Pbi Performance Products, Inc.
Charlotte, NC, USA

Karen Lehtonen
Lion First Responder Products, Inc.
Dayton OH, 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:
- 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
- Assess the need for new and/or revised Standards
Thursday, January 28, 2016

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

8:05 AM
Welcome to San Antonio, TX
Lieutenant Jim Reidy, San Antonio Fire Department

8:15 AM
Identifying and Addressing Important Gaps in Current PPE Standards
D. B. Thompson, R. L. Barker, E. A. DenHartog, R. B. Ormond and
A. S. Deaton, Textile Protection and Comfort Center, North Carolina State University,
Raleigh, NC, USA

8:35 AM
Synchronizing and Integrating Standards into Next Generation First Responder
Personal Protective Equipment Development - An Implementation of the National
Strategy for CBRNE Standards
P. J. Mattson, J. Merrill, T. Lustig and W. Deso, Department of Homeland Security,
Washington, DC, USA

8:55 AM
Integrating Design and Materials for Flame Resistant Garments
M. Roylance and M. Auerbach, US Army Natick, Soldier RD & E Center, Natick, MA,
USA

9:15 AM
How does an Arc Flash Rated Fabric Work to Protect?
H. Hoagland and S. Klausing, ArcWear, Louisville, KY, USA

9:35 AM
An Alternative Method for Calibration of Copper Slug Calorimeters Based on
Analysis of Cooling Curves
T. Godfrey and G. Proulx, US Army Natick, Soldier RD & E Center Natick, MA, USA

9:55 AM  Break

10:10 AM
An Evaluation of Bleach on the Flame Resistant Properties of a Common Flame-
Resistant Cotton Blended Fabric
J. Kirby, S. Klausing and H. Hoagland, ArcWear, Louisville, KY, USA
10:30 AM  
**Parametric Study of Fabric Characteristics’ Effect on Vertical Flame Test Performance Using Numerical Modeling**  
M. E. Kim and T. Godfrey, US Army Natick, Soldier RD & E Center Natick, MA, USA; and N. Dembsey, WPI, Worcester, MA, USA

10:50 AM  
**Advanced Layering Systems and Design for the Increased Thermal Protection of Wildland Fire Shelters**  
A. C. Hummel, R. L. Barker, and A. Nagavalli, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA

11:10 AM  
**A Comparison of Test Methods for Evaluating Textiles for Protection from Hot Water Splash**  
S. Paskaluk, G. Murtaza, J. Batcheller and M. Ackerman, University of Alberta, Edmonton, Alberta, Canada

11:30 AM  
**Effects of Convective and Radiative Heat Sources on Thermal Response of Single and Multiple-Layer Protective Fabrics in Bench Top Tests**  
D. Torvi, M. Rezazadeh and C. Bespflug, University of Saskatchewan, Saskatoon, Saskatchewan, Canada

11:50 AM  
**LUNCH** (On Your Own)

1:20 PM  
**Method for Assessing High Intensity Heat Transmission through Fabrics with a CO2 Laser**  
J. Fitek, M. Auerbach and M. Grady, US Army Natick, Soldier RD & E Center, Natick, MA, USA

1:40 PM  
**Comparison of Two Test Methods for Evaluating the Radiant Protective Performance of Wildland Firefighter Protective Clothing Materials**  
A. C. Hummel, K. Watson and R. L. Barker, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA

2:00 PM  
**Experimental Study of Heat Flux in Propane Flash Fires**  
S. Paskaluk and M. Ackerman, University of Alberta, Edmonton, Alberta, Canada
2:20 PM
Off-Gassing and Heat Release Characteristics of Thermal Protective Fabrics Under Radiant-Heat Exposure
G. Song, Iowa State University, Ames, IA, USA; and S. Mandal, University of Alberta, Edmonton, Alberta, Canada

2:40 PM
Real-Time Monitoring and Assessment of Thermal and Toxicological Risk Associated with Fire Retardant Textiles in Full-Size Simulation of an Engulfment Flash Fire
J. Vercellone, Kaneka Americas Holding, Inc., New York, NY, USA; C. E. Mackay S. Vivanco, and S. McClure, AMEC Foster Wheeler, Irvine, CA, USA; and T. E. Reinhardt, AMEC Foster Wheeler, Seattle, WA, USA

3:00 PM Break

3:15 PM
Considerations for Applying Man-In-Simulant-Test Methodologies for the Evaluation of Fully Encapsulating Chemical Protective Ensembles
B. Ormond, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA

3:35 PM
Toxicity-Based End Points for Chemical Permeation Resistance Testing
J. Stull and G. Stull, International Personnel Protection, Inc., Austin, TX, USA; C. Baxter and B. Lancaster, Technical Support Working Group, Alexandria, VA, USA

3:55 PM
Permeation of Active Ingredient in Pesticide Formulations through Disposable and Reusable Chemical-Resistant Gloves
A. Shaw, A.C. Coleone and J. Machado Neto, University of Maryland Eastern Shore, Princess Anne, MD, USA

4:15 PM
A Newly Developed Chemical Permeation Test Cell
C. J. Mekeel, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA; and P. Gao, National Personal Protective Technology Laboratory, Pittsburgh, PA, USA
4:35 PM
Criteria for the Selection of a Reference Material for the ASTM F739 Permeation Resistance Test Standard
W. J. Gabler, R. Ormond and C. J. MeKeel, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA

4:55 PM
Closing Remarks
Brian Shiels and Karen Lethonen, Symposium Co-Chairs

5:00 PM RECEPTION

FRIDAY, JANUARY 29, 2016

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

8:05 AM
Use of Thermal Manikins for Evaluation of Heat Stress Imposed by Personal Protective Equipment
X. Xu, J. A. Gonzalez, A. J. Karis, T. P. Rioux and A. W. Potter, US Army Research Institute of Environmental Medicine, Natick, MA, USA

8:25 AM
Heat Stress in Chemical Protective Coveralls - Is Thermal Sweating Manikin Testing Always More Informative than a Sweating Hotplate
S.Q. Wen, J. Batcheller and S. Petersen, University of Alberta, Edmonton, Alberta, Canada

8:45 AM
Alternative Methodologies for Determining the Impact of Clothing Ventilation in Structural Firefighter Turnout Suits
M. McQuerry, A. Hummel, E. DenHartog and R. Barker, Textile Protection and Comfort Center, North Carolina State University, Raleigh, NC, USA

9:05 AM
Evaluation of Fatigue in Firefighters Wearing Different Turnout Suits
I. L. Ciesielska-Wrobel, and L. Van Langenhove, Ghent University, Department of Textiles, Ghent, West-Vland, Belgium
9:25 AM
Development of a Human Sensation-Relevant Method for Measuring Phase Change Materials
K. R. Blood, R. A. Burke and D. B. Howe, Thermetrics, LLC, Seattle, WA, USA

9:45 AM Break

10:00 AM
Round Robin Testing of European Weight Fire-fighter Clothing
J. D. Dale, S. Paskaluk and E. M. Crown, University of Alberta, Edmonton, Alberta, Canada

10:20 AM
Investigation and Development of an Improved Liquid Integrity Test

10:40 AM
Why does the Structural Integrity of Flame Resistant (FR) Protective Clothing—The Value Metric for Workers and Employers—Hang by a Thread?
V. Diaz, Atlantic Thread & Supply Co., Baltimore, MD USA

11:00 AM
Identification of Soils on Firefighter Turnout Gear from the Philadelphia Fire Department
E. P. Easter, University of Kentucky, Lexington, KY, USA; D. Lander, DuPont, Landerberg, PA, USA; and T. Huston, Galls Inc., Lexington, KY, USA

11:20 AM
Non-Destructive Chemical/Biological Analysis Techniques Enabling Effective PPE Decontamination Strategies
J. Stull and G. Stull, International Personnel Protection, Inc., Austin, TX, USA; C. Baxter and B. Lancaster, Technical Support Working Group, Alexandria, VA, USA

11:40 AM LUNCH (On Your Own)
12:40 PM
Comparison of Laboratory and Clinical Effectiveness of Antimicrobial Healthcare Apparel
M. Hardwick, ResInnova Laboratories, Tahoma Park, MD, USA

1:00 PM
Back Protector Performance Standard Methodologies vs. Realistic Testing - EOD Bomb Suits
J.-P. Dionne, J. Levine and A. Markis, Med-Eng - A Safariland Group Company, Ottawa, Ontario, Canada

1:20 PM
Closing Remarks
Brian Shiels and Karen Lethonen, Symposium Co-Chairs

1:25 PM SYMPOSIUM ADJOURNS