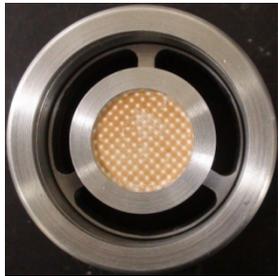


# Development of PPE Ensemble Test Methods FY12 (927ZKRA)

## Objective

To develop innovative test methods for evaluating the integrity of protective clothing and ensembles against aerosol particulate challenges.



Refined penetration cell



Wind tunnel test

## Applicable Standards

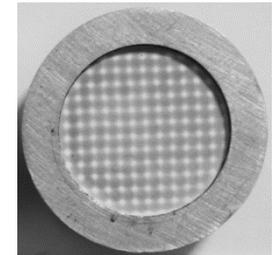
- ASTM F23
- NFPA 1994, 1971, 1951

## Key Partners

- NIOSH NTRC
- Washington University in St. Louis (Wash U)
- Clarkson University

## Stakeholders

- PPE manufacturers
- Firefighters
- NIOSH NTRC
- DuPont NOSH consortium
- ASTM
- NFPA
- IAFF



Particle deposition on the MPAS substrate

## Project Scope

- Task 1. Optimization of the magnetic passive aerosol sampler (MPAS) design – evaluating MPAS efficiency under various conditions and interferences, and comparison with reference samplers.
- Task 2. Development and validation of a standardized bench-scale particulate penetration test method.

## Milestones FY12

- Q1 Submitted 3 manuscripts to the journal of *Aerosol Science & Technology*
- Q2 Refined penetration cell design for Task 2
- Q3 Evaluate performance of the penetration cell under conditions of different particle sizes, various clothing materials, and different wind velocities
- Q4 Submit a manuscript from the performance evaluation

## Outputs

- Manuscripts published in peer-reviewed journals (3 published that have been cited 5 times, 1 accepted, 2 submitted, more in development)
- Presentations at national/international conferences and stakeholder meetings (11)
- Wash U final report on CFD modeling of the MPAS performance
- Employee invention reports (2)
- Book chapter (1)

## Outcomes

- This project has contributed to NIOSH NTRC report titled “Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials”
- This project has resulted in a new project on nanoparticle penetration through protective clothing funded by NTRC (the study was completed)
- Expected outcome is to improve standards and test methods for protective clothing used for protection against inert and biological aerosols

Updated: 23 March 2012