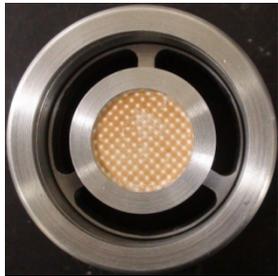


# Development of PPE Ensemble Test Methods FY13 (927Z1NQ)

## 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

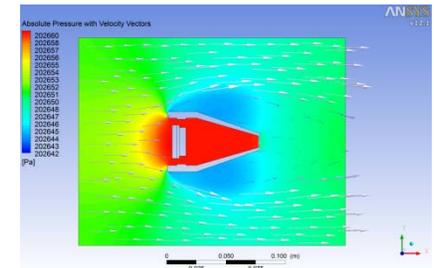
- ASTM F23, E56
- NFPA 1994, 1971, 1951

## Key Partners

- NIOSH NTRC
- Washington University in St. Louis

## Stakeholders

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



CFD of the penetration cell

## Project Scope

- Task 1. Optimization of the multidomain magnetic passive aerosol sampler (MPAS) design
- Task 2. Development and validation of a standardized bench-scale particulate penetration test method

## Milestones FY13

- Q1. Completed determination of pressure drops for selected protective clothing materials; finalized penetration cell design
- Q2. Completed particle collections under different wind speeds; numerical simulations with a turbulence model; published an article in *Aerosol Science & Technology*
- Q3. To complete computer controlled SEM analyses for all the samples; extend the application of the MPAS to particles > 500 nm; present new research findings at AIHce 2013
- Q4. To submit a manuscript on development of a bench-scale particulate penetration test method for internal review

## Outputs

- Manuscripts published in peer-reviewed journals (5 published that have been cited 11 times, one received the David L. Swift Memorial Outstanding Aerosol Paper award, more in development)
- Presentations at national/international conferences and stakeholder meetings (12), two of them received Best Poster of the Section at AIHce
- Wash U final report on CFD modeling of the MPAS performance
- Employee invention reports (2)

## 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: 28 March 2013