

Joint Science & Technology Office for Chemical and Biological Defense (JSTO-CBD)

Rapid Innovation Fund (RIF) Efforts

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Distribution Statement A: Approved for public release, distribution is unlimited.



CBDP Enterprise



JRO-CBRN
Requirements to
JSTO-CBD



JSTO-CBD
Mature
technologies to
JPEO-CBD



JPEO-CBD
Solutions to
warfighter

Prioritized needs



J9CB Goal

J9CB Mission: Lead DoD science and technology to anticipate, defend and safeguard against chemical and biological threats for the warfighter and the nation



Advance Early Warning



Prepare For Surprise



Protect The Force



What is RIF?

- Rapid, responsive acquisition and the engagement of small, innovative businesses in solving defense needs
- Validation and transition of innovative technologies developed predominantly by small businesses via Small Business Innovation Research (SBIR) and/or Technology Transfer (STTR) Programs
- Technologies address
 - Operational challenges
 - Critical national defense needs
- 2-year project maximum

Small Business

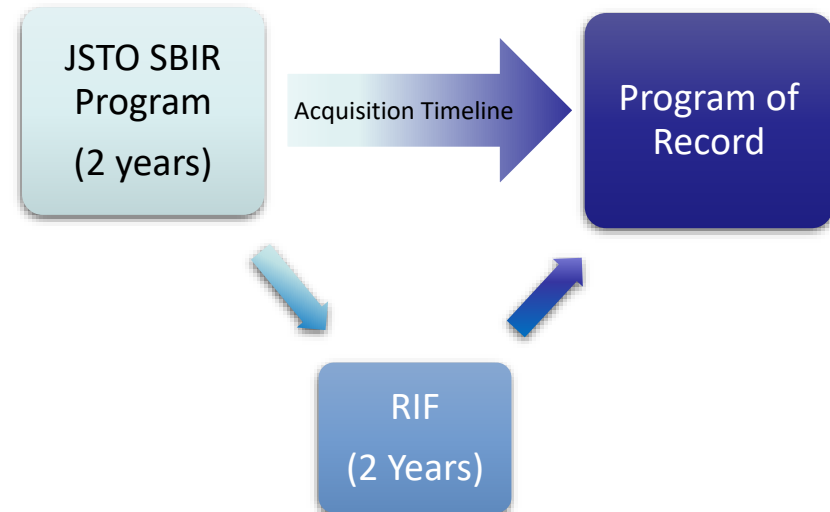


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Why RIF FOR JSTO-CBD?

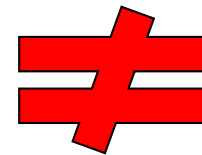
- Rapid transition of innovative technologies
 - Developed technologies move to a higher Technology Readiness Level (TRL) for potential transition to acquisition program
 - Decrease risk to acquisition program
- Transition of technologies resulting from innovations that showed merit JSTO or CBD SBIR/STTR programs but is not quite ready for transition to a Program of Record/acquisition





JSTO-CBD RIF Topic Development

- Topics developed as a follow-on to SBIR/STTR and JSTO-CBD funded programs
 - Had success for R&D efforts but not quite to the point required by acquisition Program of Record (POR)
- Technologies developed are innovative and could work for warfighters' identified need/gaps
 - Can help bridge the "valley of death"
- Use RIF Requirements (topics) to further mature technologies
- 2012-2017: JSTO-CBD developed nine RIF topics accepted into the BAA





Current and Past Funded JSTO-CBD RIF Projects

Funding Year	Company	Title
2012	Guild Associates (SB)	Advanced Filtration Technologies
2012	Guild Associates (SB)	Guard Bed to Increase M98 Lifetime
2012	TDA Research, Inc. (SB)	Advanced Materials for Personal Filtrations Systems
2013	Materials Modification Inc. (SB)	Multifunctional Chemical/Biological Warfare Agent Repellant Coating for Military Textiles
2014	RINI Technologies, Inc. (SB)	Personal Thermal Management Systems
2014	InnoSense, LLC (SB)	Anti-Fog Mask Coatings
2015	Aerosol Dynamics, Inc. (SB)	Wearable Respirator Protection Assessment System
2016	NanoTerra, Inc. (SB)	Rugged Temporary Protective Overcoat with Significant Chemical Warfare Agent Resistance

(SB) = Small Business



Successes

- JSTO-CBD has had highest amount of success in technologies that transition into a POR using BA7 funding
 - Includes
 - Filter technologies
 - Anti-fog coatings
- Other successes include development of thermal management, agent repellant textiles, and a respirator assessment system

Respirator Protection Assessment System



Thermal Management



Agent repellant Textiles





Individual Protection Filters

- Purpose
 - Develop next-gen filters for use in Chem/Bio individual protection systems utilizing state-of-the-art materials
 - Focus on optimizing the balance between performance, hardness/ruggedness, and pressure drop
 - Focus on single pass technologies centered on reducing burden of current individual protection systems
- Challenge
 - Remove battlefield contaminants while maintaining performance with classical threats in single pass technology
 - Optimize the balance between performance, hardness/ruggedness, and pressure drop
- Successes
 - Prototype M61 filters exceeds performance specifications for ammonia, NO₂, DMMP (nerve agent simulant), and methyl bromide
 - First demonstration of Metal Organic Framework (MOF) prototype M61 filter
 - Increased MOF batch size by >10x from gram to kilogram scale



ls in



Collective Protection Pre-Filters

- Purpose

- Develop replaceable guard bed and extend filter life by 50%
- Develop next-gen filters for use in Chem/Bio collective protection systems utilizing state-of-the-art materials; focus on optimizing the balance between performance, ruggedness, and pressure drop
- Focus on single pass technologies centered on reducing burden of collective protection systems

- Challenge

- Remove battlefield contaminants while maintaining performance with classical threats
- Optimize the balance between performance, ruggedness, and pressure drop

- Successes

- Extended service life by 50%
- Lowered cost of manufacturing and materials to 1/10 current cost
- Long term testing conducted



ECBC and NSWC personnel installing guard beds.



Filter plenum with guard beds installed



Anti-Fog Mask Coatings

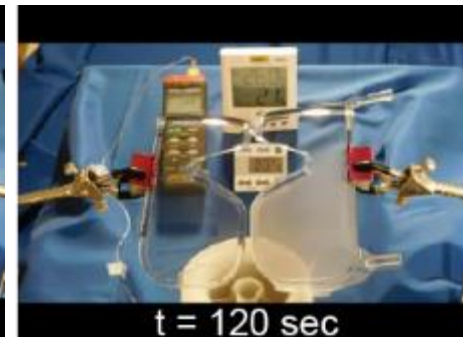
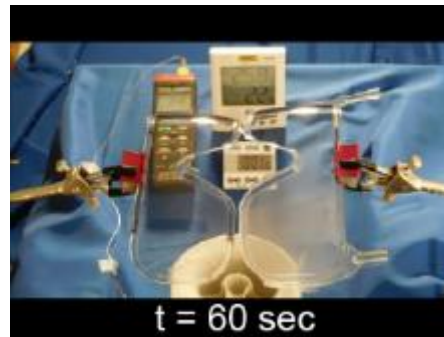
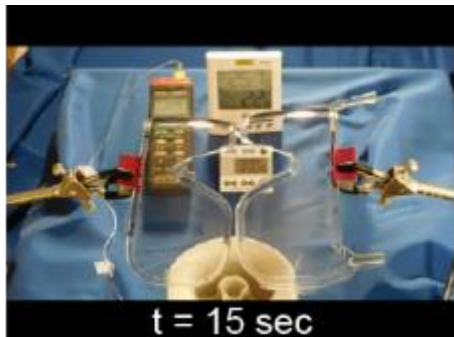
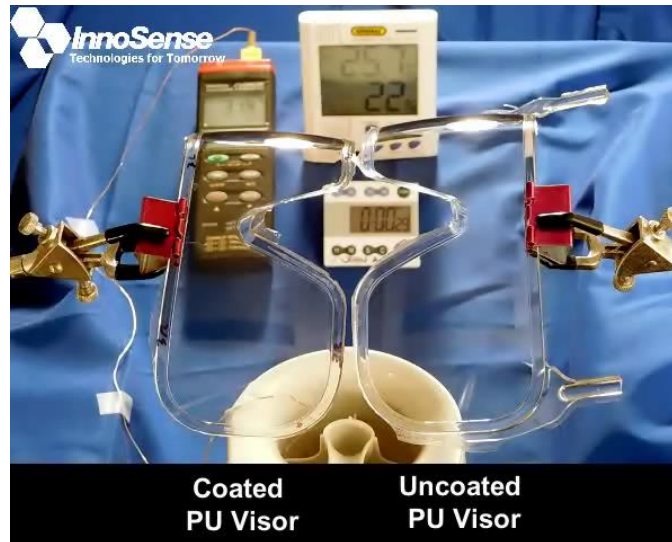
- Purpose
 - Respiratory protection systems (e.g. Joint Service Air Mask (JSAM), M50, C50, and M53) that address CBRN environments are prone to lens fogging which can severely impact mission performance
 - Develop anti-fog coatings for respiratory protection systems
- Challenge
 - Prevent fog from forming on inside surface of respirator lenses (as well as outside surfaces)
 - Allow soldier to continue to perform duties while not being hindered by obscuration
- Successes:
 - Demonstrated capability of coating
 - Developed production rate capable method
 - Demonstrated production level run of coating
 - Demonstrated coating consistency
 - Tested coating for light transmittance, haze, solvent durability, mechanical durability



Successful Anti-Fog coatings will transition to Joint Program Manager for Protection (JPM-P)



Permanent Anti-Fog Coatings for Protective Masks (video demo)





Questions

