NASAfacts

Space Technology
Game Changing Development
Minimalistic Advanced Soft-Goods Hatch (MASH)

The Minimalistic Advanced Soft Goods Hatch (MASH) project will mature high-payoff structures and materials technologies for NASA's future space exploration missions. Inflatable structures have been identified as a near-term beneficial technology for deep-space habitation and considered required technology for longer term surface habitation. Near term, the MASH project has been directed to address the goal of improved inflatable structures packaging density to reduce launch costs. Inflatable airlocks and habitats are key structural components that enable astronaut extravehicular activity (EVA) and human residency on lunar and planetary surfaces. Efficient design, storage techniques, and deployment methods of these structures are key to achieving future exploration goals.

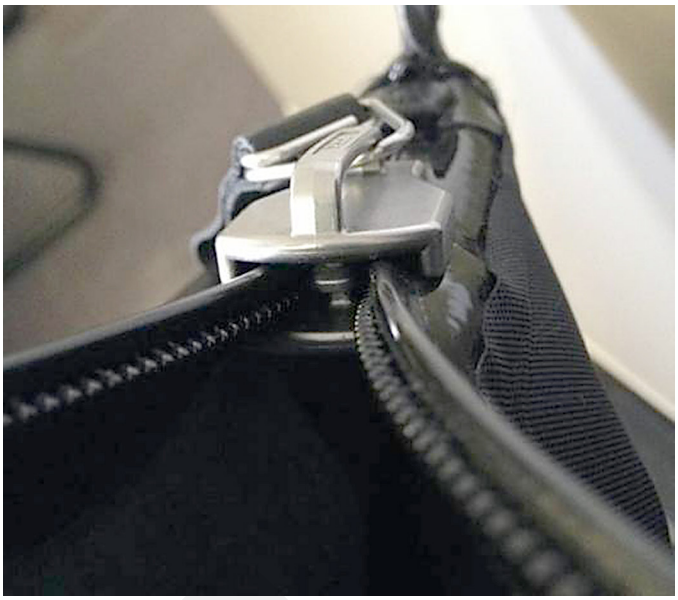
Scaled airlock demonstrator design.

The MASH project is researching and developing a unique lightweight soft-goods hatch system to improve packaging efficiency of inflatable airlocks. Current airlock designs integrate a rigid hatch into the soft-goods fabric material system. The resulting airlock storage potential is limited by the rigid hatch. The MASH project is researching a novel flexible and foldable hatch design to allow for maximum storage potential. The MASH hatch is envisioned to deploy in relation with the airlock soft goods while providing an airtight seal. EVA operations would remain similar to current operations. Over the next year, the MASH project will design, fabricate and demonstrate a compactly stowable hatch system for a reference inflatable airlock design. The hatch system will meet customer performance requirements and demonstrate improvements in packaging efficiency.

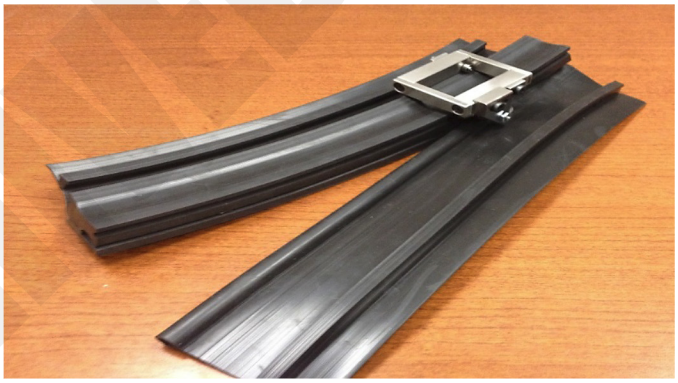
The Game Changing Development (GCD) Program investigates ideas and approaches that could solve significant technological problems and revolutionize future space endeavors. GCD projects develop technologies through component and subsystem testing on Earth to prepare them for future use in space. GCD is part of NASA's Space Technology Mission Directorate.

For more information about GCD, please visit http://gameon.nasa.gov/

Full-scale mock-up.



Flexible linear seal development.



Linear seal closing mechanism.

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