

PI: Michael Izenson
 Creare, Inc. - Hanover, NH

Identification and Significance of Innovation

Condensing heat exchanger (CHX) for ECLSS

- Controls humidity by condensing moisture from cabin air
- Hydrophilic coating needed for condensate control
- Attractive breeding ground for microbes? must include biocide
- Creare has developed an adherent, hydrophilic, biocidal coating
- Coating needs features to extend lifetime

Innovation: Coating with features to extend lifetime

- Improved coating chemistry inhibits coating degradation; maintains coating integrity and biocidal properties for long life
- Zero-gravity, mass-efficient cleaning process for removing contamination to restore hydrophilic properties

Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

Goal: Improve long-term safety and reliability of manned spacecraft and lunar and planetary bases

- Ensure high performance of CHX and downstream ECLSS components
- Prevent microbe growth and related health/safety hazards
- Coating and cleaning process applicable to prototypical CHX materials and structures

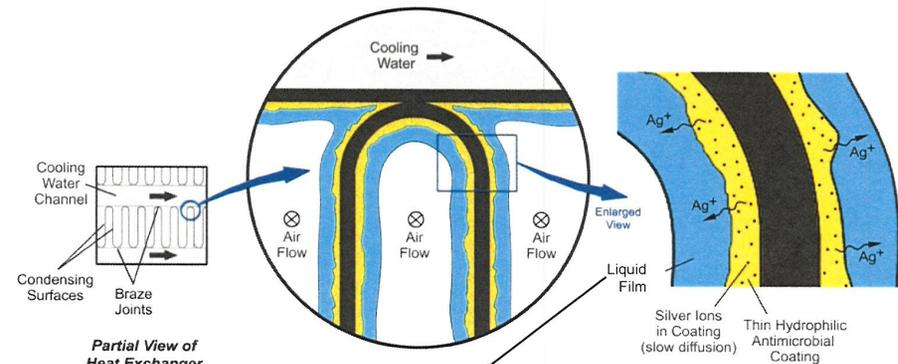
Technical objectives for extended coating service life

- Retain excellent properties of Creare's existing coating
- Add features to enhance coating lifetime and enable recovery from contamination

Phase I work plan

- Produce coated sample coupons
- Evaluate coating performance and improve analysis models
- Select and evaluate cleaning solutions

Coating Concept



Liquid Film:

- During Operation – Crew Condensate
- During Cleaning – Cleaning/Rinsing Solutions

NASA Applications

- ECLSS for manned lunar and/or planetary bases
- ECLSS for future manned spacecraft
- Space Station upgrades to replace or clean existing CHX

Non-NASA Applications

- Water management for fuel cell power systems
- Hydrophilic coatings for any condensing heat exchanger
- Biocidal coatings for any water heat transfer surface
- Coatings for compact heat exchanger/reactors

Firm Contacts

Michael Izenson
 Creare, Inc.
 P.O. Box 71
 Hanover, NH, 03755-3116
 PHONE: (603) 643-3800
 FAX: (603) 643-4657