

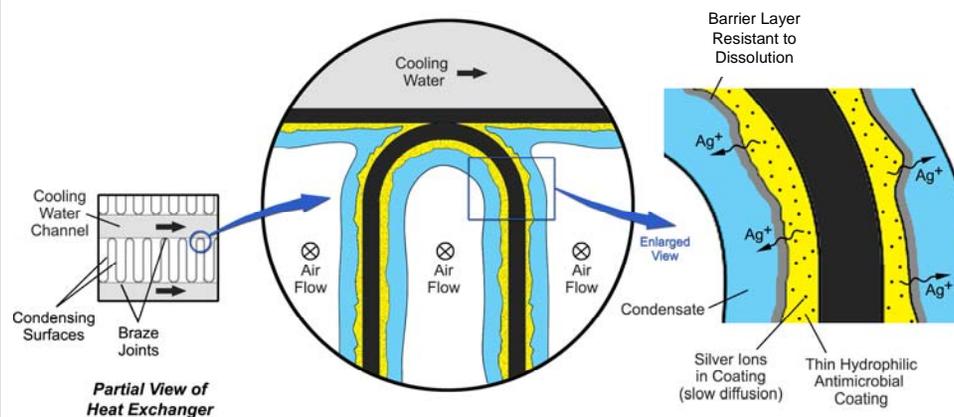
Long Life, Hydrophilic, Antimicrobial Coating for Condensing Heat Exchangers

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 Proposal No. 10-X3.04-8863

Identification and Significance of the Innovation

- Condensing heat exchanger (CHX) for ECLSS
 - Controls humidity by condensing moisture from cabin air
 - Needs hydrophilic coating for efficient and reliable performance
 - 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
 - Coating structure inhibits diffusion and maintains biocidal properties for long life
 - Barrier layer inhibits diffusion and dissolution
- Technology Readiness Level:
 - TRL 3 at beginning of Phase I contract
 - TRL 4 at end of Phase I contract

Coating Concept



Technical Objectives and Work Plan

- Goal: Improve long-term safety and reliability of manned spacecraft and lunar and planetary bases
 - Ensure high performance of condensing heat exchanger and downstream ECLSS components
 - Prevent microbe growth and related health/safety hazards
 - Coating applicable to prototypical CHX materials and structures
- Technical objectives for coating renewal process
 - Retain excellent properties of Creare's existing coating
 - Add features to enhance lifetime
- Phase I work plan
 - Produce coated sample coupons
 - Evaluate coating performance
 - Select optimal coating

NASA and Non-NASA Applications

- NASA Applications/Manned Space Exploration
 - ECLSS for manned lunar and/or planetary bases
 - ECLSS for future manned spacecraft
 - Space Station upgrades to replace existing condensing heat exchanger
- 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

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NON-PROPRIETARY DATA