NASA SBIR/STTR Technologies

Efficient, Long-Life Biocidal Condenser

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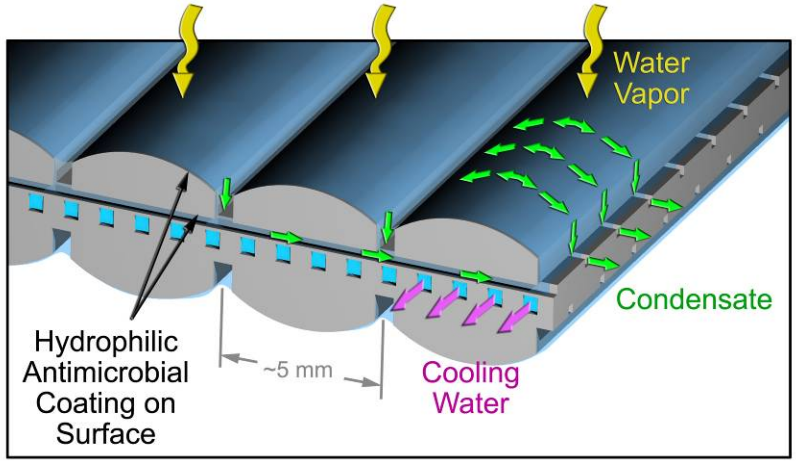
Identification and Significance of the Innovation

- Condensing heat exchanger (CHX) for ECLSS
  - Controls humidity by condensing moisture from cabin air
  - Requires hydrophilic coating for efficient and reliable performance
  - Provides attractive breeding ground for microbes—must include biocidal agents
  - Coating in the space station CHX are coming off the surface
- Innovation: Novel coating and heat transfer surface
  - Novel coating formulation forms very strong bonds with surface
  - Provides long-term hydrophilic and biocidal surface properties
  - Should also help prevent against corrosion
- Builds on established condenser design
  - Innovative condensate management and high efficiency condensation already demonstrated



Condensing Heat Exchanger with Hydrophilic/Biocidal Surface Coating

Technical Objectives and Work Plan

- Improve safety and reliability of manned lunar and planetary bases
  - Prevent growth of microbes and related health/safety hazards
  - Proposed coating will be long-lasting and reliable
- Technical objectives for coating and condenser
  - Anti-microbial (prevents microbe growth and associated problems)
  - Very hydrophilic (controls condensate flow during startup)
  - Efficient (minimizes power consumed for dehumidification)
- Phase I work plan
  - Develop coating process
  - Measure coating performance
  - Design Phase II prototype

NASA and Non-NASA Applications

- NASA Applications
  - 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

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