

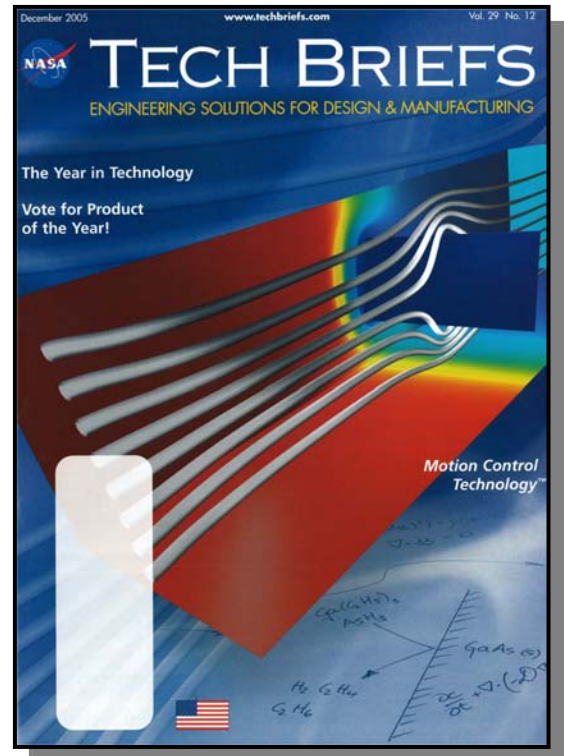


## Lightweight Radiator System for a Spacecraft

Three documents describe various aspects of a proposed lightweight, deployable radiator system for dissipating excess heat from the life-support system of a habitable spacecraft. The first document focuses on a radiator tube that would include a thin metal liner surrounded and supported by a thicker carbon-fiber-reinforced composite tubular structure that, in turn, would be formed as part of a unitary composite radiator-fin structure consisting mostly of a sheet of reticulated vitreous carbon laminated between carbon-fiber-reinforced face sheets. The thermal and mechanical properties, including the anisotropies, of the component materials are taken into account in the design. The second document describes thermo-structural bumpers, in the form of exterior multiple-ply carbon-fiber sheets enclosing hollows on opposite sides of a radiator fin, which would protect the radiator tube against impinging micrometeors and orbital debris. The third document describes a radiator system that would include multiple panels containing the aforementioned components, among others. The system would also include mechanisms for deploying the panels from compact stowage. Deployment would not involve breaking and remaking of fluid connections to the radiator panels.

*This work was done by Robert J. Copeland, Georgia Mason, and Mark M. Weislogel of TDA Research, Inc., for Johnson Space Center. For further information, contact the Johnson Technology Transfer Office at (281) 483-3809.*

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