

## 07/2010- Phase I Results: Quest's Wrapped-MLI Nearly 4 Times Better Than Current Transfer Pipe Insulation

Quest has completed a NASA Phase I SBIR contract to design and develop a new concept for advanced thermal insulation for cold or hot transfer pipes. Wrapped MultiLayer Insulation (WMLI) prototypes were built, installed on custom test calorimeters, and heat leak into the pipes was measured. Wrapped-MLI had 3.6 times better thermal performance than conventional MLI pipe insulation.

The Wrapped MLI concept, which uses Quest's and partner Ball Aerospace's innovative discrete spacer technology to control layer spacing and reduce heat leak, was successfully demonstrated feasible.

WMLI provides 3.6 times better thermal insulation for cryogenic piping per layer than current conventional cryo feed line insulation. Modeling indicates WMLI could be further developed in a Phase II program with custom, micromolded discrete polymer spacers to obtain 3-fold lower heat leak.

Better insulated piping could provide more efficient cold or hot fluid transfers, useful in spacecraft, orbiting fuel depots, Ground Support Equipment for cryogen transfers to launch vehicles and in wide spread industrial hot or cold fluid transfer processes.

