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# Colorado Engineering Firms Win NASA Grant to Develop Innovative Insulation for Next Generation Spacecraft - Super-Insulation May Allow Future Energy Efficient Appliances

**DENVER, Feb. 5 /PRNewswire/** -- Quest Product Development, teaming with Ball Aerospace & Technologies Corp., has completed a NASA research program and successfully demonstrated a new thermal insulation. NASA has awarded the team a Small Business Innovation Research Phase II grant to develop and commercialize this advanced thermal insulation.

Integrated Multilayer Insulation ("IMLI"), vital for NASA's new spacecraft and exploration missions would preserve rocket fuels such as liquid oxygen and liquid hydrogen. These cryogenic propellants are high energy, "green" non-toxic fuels, but require insulation to reduce boiloff before launch and during missions. According to Ball Aerospace Principal Engineer, Gary Mills, "The industry is in a transition of cryogenic propellant technology from launch vehicles that operate for 20 minutes to exploration spacecraft that operate for months and require propellant insulation that is lightweight with high thermal performance before launch and on-orbit." Quest uses micro-molding to create engineered polymer structures that form extremely effective thermal barriers. Scott Dye, Principal Investigator, explains, "Micromolded parts provide structural integrity, low mass and low thermal conductivity, all requirements for space flight use."

IMLI technology may also find applications on Earth to insulate cryo-tanks storing liquid oxygen and nitrogen; to insulate shipping containers; and to insulate home appliances. A 1" panel could have an insulation "R-value" of 1600, compared to current foam insulation with an R-value of 7. Quest's Director of Technology Development, Alan Kopelove, believes refrigerators/freezers with IMLI insulation could use fifty-percent less energy, and offer unique styling such as thin panels, and says, "IMLI may enable energy efficient appliances that surpass new federal energy recommendations". Water heaters with improved insulation could use eighteen-percent less energy. Data suggests that implementing IMLI for these two home appliances could provide annual energy savings of \$8 billion in the U.S.

Quest Product Development (<http://www.quest-corp.com>) is a technology and product development company, and brings new technologies from universities and companies to market. Ball Aerospace is a leading company with more than 50 years experience in space system development and innovative technologies. The NASA Phase II grant, for \$600,000, is for the second of three phases of product development designed to provide a commercially available product for use in NASA's new spacecraft and commercial insulation applications.

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