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Evaluation of Density Distribution and Flow Stress of Compacted Fine Aluminum Powders in the Extrusion Process

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Abstract

The US Department of Energy Inventions & Innovations (I&I) Program awarded research funding at the level of \$75K to a team led by EMV Innovative Material Technologies, LLC. The other team members include Lehigh University's Institute for Metal Forming, New York Wire Company, Ampal, Inc., Birdsboro Alloying, Inc. and IMCO Recycling, Inc. The project is entitled "Cost-Effective Consolidation of Fine Aluminum Scrap for Increased Re-melting Efficiency." The project's start date was October 1, 2003 and the completion date is March 31, 2005. The DOE I&I Program had received 252 proposals, of which nine received funding, among them EMV Technologies from Bethlehem, PA. Information about this award is available online at <http://www.oit.doe.gov/cfm/fullarticle.cfm/id=775>. A cost-effective process for the recycling and recovering of light aluminum scrap that will minimize melt loss, and in turn improve energy efficiency, will be developed based on preliminary promising laboratory results. Specifically, the process will develop a direct extrusion consolidation method to convert light scrap with high surface area into a low surface area product that can be re-melted in conventional processes with low melt loss. Projected energy savings of 11.6 trillion Btu/year are estimated based on full implementation of the process. Partner organizations include the Aluminum Association, EMV Innovative Material Technologies, LLC (Bethlehem, PA), Birdsboro Alloying, Inc. (Birdsboro, PA), Ampal, Inc. (Palmerton, PA), New York Wire Company (York, PA), IMCO Recycling, Inc. (Rockwood, TN), and the Department of Energy.