

Copper-Based Casting Technology Applications Program on Copper Pumps



PROBLEM/OBJECTIVE

Recent manufacturing technology breakthroughs in casting copper-based alloys, when combined with other emerging advances such as cold spraying of metals and pump system efficiency improvements have created a number of promising opportunities for improved service life and lower lifecycle costs for pumps used in DoD applications.

The Copper-Based Casting Technology Applications Program builds on prior Department of Defense funded efforts in die-cast copper motors and materials development. This program also leverages the expertise of the Army Research Laboratory (ARL). The program results include:

- Improved electric motor efficiency and service life,
- Improved quality and robustness of fluid handling components and systems used in shipboard applications,
- Increase efficiency and the potential for greater power density and lighter weight.

DoD BENEFITS

This program could:

- Reduce total ownership costs for thousands of electric motor/pump combinations currently used in military applications,
- Support legacy weapon systems, in-theatre ground support facilities, existing U.S. military bases, ships/submarines, helicopters & ground vehicles,
- Has reduced energy costs while extending pump/motor systems life by up to 50%.

IMPLEMENTATION & TECHNOLOGY TRANSFER

The Copper- Based Casting Technology Applications Program team is currently testing various motors from 6KW to 140HP; variable speeds up to 20,000 RPM.

TIMELINE / MILESTONE

Start Date: June 2009

End Date: June 2011

FUNDING

DLA ManTech \$2,124,000

PARTICIPANTS

- U.S. Army Research Laboratory (ARL)
- Baldor Electric Company
- Vforge, Inc.
- Pump Systems Master
- Copper Development Association, Inc.
- Advanced Technology International (ATI)