

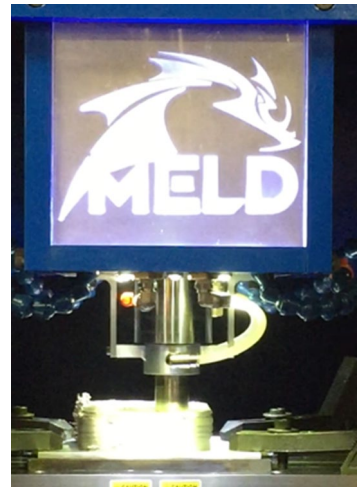


Scaling Up 3D Printed Steel Castings RA Project

Team: Kolby Pearson - NASSCO | Wes Downs & Nanci Hardwick - MELD Manufacturing | Mary Salisbury - HII | David Coates - Altair | Kim Tran - NAVSEA | Dongchun Qiao - ABS

Problem Statement

A previous NSRP project scaled up MELD 3D printing to magnitudes relevant to the shipbuilding industry. In an effort to mitigate the numerous issues from traditional castings, MELD aims to reduce these problems by introducing a new casting manufacturing process. However, the current technology has not developed the capability to use high strength steel that is commonly used in shipbuilding.



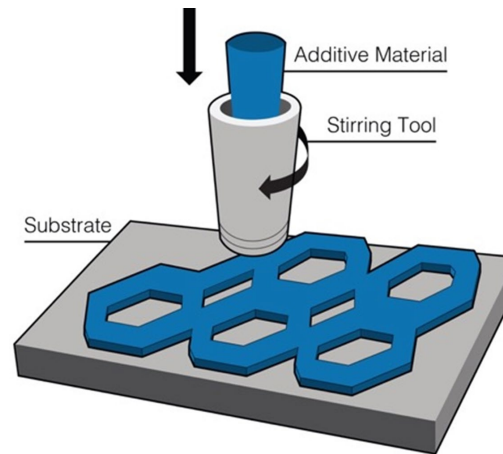
Solution / Approach

This project aims to expand the current MELD Process to high-strength steel alloys commonly used in the shipbuilding industry and work towards regulatory approval. Achieving this will require development of high-temperature and wear resistant MELD process tooling that maintains adequate mechanical properties such as hardness and fracture toughness.

After developing the parameters required to successfully print in high-yield material, validation of the prints will be performed through material testing.

Project Benefits

The successful validation of MELD's AM process for steel materials has the potential to mitigate long component lead times, eliminate material imperfections associated with traditional castings, and advance the current level of technology to print large, unique parts.



Project ROI

The MELD technology will save cost in terms of manufacturing, shipping, and lead time with the potential of manufacturing large parts on site.

Improved Product Quality

Traditional castings have the potential for imperfections, air pockets, are susceptible to cracking, have a long lead time, and have substantial added costs and/or schedule impacts associated with shipping. Validation of MELD technology has the potential to help mitigate or reduce several of these problems.

Savings

As this technology progresses and standards and guidelines are developed, the NAVY will be able to save on new construction costs for large castings and repair costs for no longer existing parts.

