

Advanced Manufacturing Confluence (AMC)



Center Street Technologies' hybrid machine (build volume of 8x12x24 ft) has two independent heads—one for fused depositing modeling (FDM) and the other for conventional machining operations.

PROBLEM

Over the last 70 years, the nation has atrophied in its capability to rapidly develop large prototypes and useful reproductions, particularly in the defense realm. The United States needs to develop new capabilities to counter adversaries and maintain its operational advantage. Technical projects that develop an affordable and reliable industrial base and manufacturing capability responsive to warfighter requirements for massive scale prototypes are needed to stay competitive.

OBJECTIVE

Execute development and preliminary process qualification of a large-scale hybrid AM process through the systematic production of strategic materials and products while leveraging various industry and government stakeholders.



**AMERICA MAKES
TECHNOLOGY
DEVELOPMENT
ROADMAP**

This project aligns to:



PROCESS

**ASTM
PROCESS CATEGORY**
Material Extrusion

EQUIPMENT
AMC 2304

MATERIAL
ABS

TECHNICAL APPROACH

Center Street Technology (CST) is leading the effort with their AMC 2304 hybrid manufacturing system. AMC 2304 is a hybrid machine with two independent heads, one for extruding material and the other for machining operations and utilizes a large build envelope of twelve feet wide, twenty-four feet long, and eight feet tall. The overall project scope has been divided into 20 subtasks. Each subtask is being executed by subject matter, process, and domain specialists from America Makes, CST, UTEP, and NCDMM. The initial subtasks center around test bed optimization, identification and implementation of software tools, and sensing as well as material testing. In addition, the project team is exploring verification and validation of AM component design and AM process control software and hardware architectures using data from test coupons, test parts, and exemplar prototypes. A Customer Advisory Board is guiding the selection of the exemplar prototypes. Data management, communication outreach, and documenting readiness levels of the AMC technology manufacturing readiness assessment are all part of the overall approach.

PROJECT START DATE

September 2020

EXPECTED END DATE

September 2022

EXPECTED DELIVERABLES

- Design, analysis and production of 3 exemplar prototypes, demonstrating the utility of the test bed system
- Establish a Customer Advisory Board to provide demonstration articles.
- Final Data Management Plan
- List of mechanical and physical data comprising the S-Basis engineering design database, incl. documented test plan reviewed with Government Review Board
- AMC catalog of materials serving broad range of design needs, including developmental products or unique blends filling gaps in catalog
- Manufacturing Readiness Assessment Report of the developed AMC capability

FUNDING

\$9,473,000 total project budget
(\$9,473,000 public funding)

PROJECT PARTICIPANTS

Project Principal:

National Center for Defense Manufacturing and Machining

Other Project Participants:

Center Street Technologies

Public Participants:

U.S. Department of Defense