



Defense-Wide Manufacturing Science & Technology (DMS&T) Program

Non-Destructive Inspection for Electron-Beam Additive Manufacturing of Titanium

PROBLEM / OBJECTIVE

- One of the major obstacles associated with introducing additive manufactured components into the F-35 Joint Strike Fighter (JSF) supply stream is the lack of an adequate non-destructive inspection (NDI) methodology
- The capability of NDI techniques has not been established and/or standardized for accurate, reliable inspection of Electron Beam Additive Manufacturing (EBAM) components.

APPROACH / BENEFITS

Objective

- Assess capability of traditional and emerging NDI methods for reliably detecting critical flaws in EBAM components.
- Identify and recommend most cost-effective NDI methods for detecting various flaw types and sizes.

Approach

- Implement “standardized” NDI processes and procedures for JSF EBAM structural components.
- Provide the capability of traditional and emerging NDI techniques for ensuring reliable quality assurance of EBAM components
- Help mature the Manufacturing Readiness Level of Direct Digital Manufacturing (DDM) processes to support production readiness

Expected Benefits and Warfighter Impact

- Utilizing EBAM technology in manufacturing F-35 titanium components will significantly lower overall manufacturing costs since EBAM facilitates the fabrication of components to a near-net shape, requiring less raw material and machining.

- It is expected that EBAM will help to reduce per part manufacturing costs by 35 to 60 percent compared to manufacturing complex-shaped parts by conventional processing.



Additive Manufacturing Part Before Machining

POINT OF CONTACT

Government Point of contact:

Kevin Klug, CTC
910-437-9904
klugk@ctc.com