Electron Beam Additive Manufacturing

John O'Hara **Global Sales Manager**
johara@sciaky.com
(312) 459-6849

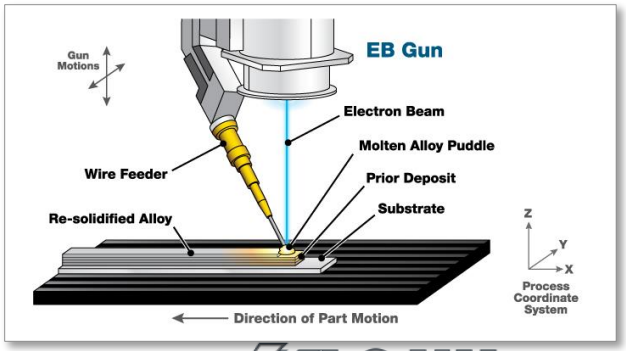
www.sciaky.com

Why EB Additive Manufacturing?

- Material savings, 20-75%
- Reduced machining, 20-75%
- Lead time reduction, over 80% possible

- HIGH deposition rates target LARGE parts
- EBAM uses already available wire feedstock
- Very efficient, high power Electron Beam (up to 42 KW)
- Vacuum processing ideal for reactive alloys ($1x10^{-5}$ Torr)
- High Deposition rates (up to 25 lb. / hour)
- Large Build Envelope (> $30m^3$)

Courtesy Lockheed Martin



Sciaky EBAM Process Controls

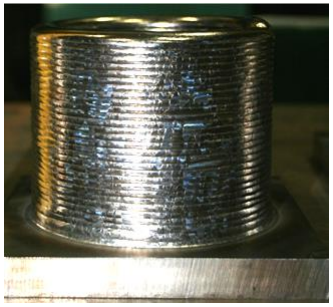
Adaptive Thermal Control by way of real time molten pool measurements

Process Benefits that the EBAM process with Closed Loop Controls:

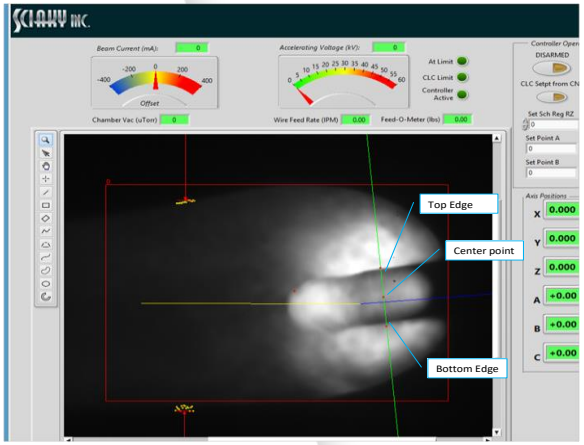
- Bead Geometry Uniformity
- Consistent Microstructure
- Consistent Mechanical Properties
- Consistent Chemistry
- Automated and adaptive Real-Time Process Controls
- Automatic Process Variable Acquisition and Recording

Without CLC

With CLC



CLC & Auto Wire Positioning



IRISS
Interlayer Realtime Imaging & Sensing System

SCIAKY INC.

EBAM Wire Feedstock

EBAM metal or alloy candidates:

- Titanium 6Al-4V and ELI grade
- Nickel alloys 718, 625
- Stainless Steel (300 series)
- 70-30 Copper Nickel
- 2319, 4043 Aluminum
- 4130, 4340, P20 Steel
- Copper
- Molybdenum
- Tantalum
- Zircalloy
- Niobium
- Tungsten

Common wire feedstock sizes:

0.045” (1.1 mm)
0.063” (1.6 mm)
0.093” (2.4 mm)
0.125” (3.2 mm)
0.156” (4.0 mm)

Two spool formats available: Nominal 12” O.D. Spool has capacity of 15-35 Lbs, Large spool capacity up to 150 Lbs.

Qualification Progress with EBAM

LOCKHEED MARTIN

SCIAKY INC.

Worldwide Leaders in Metal 3D Printing Technology & EB Welding Solutions

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