

# Welding

Surface Technologies



## Welding

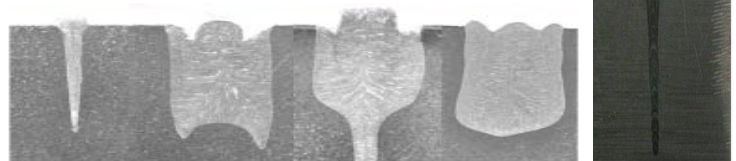
Virtually all metals can be welded with an electron beam. When fast moving electrons in a focused beam hit a metal surface they are decelerated which transforms their kinetic energy into thermal energy (heat) in the component resulting in instant material fusion or melting due to high energy density of the e-stream. The high energy density instantly vaporizes the material, generating a so-called key hole. A characteristic of this phenomenon is that it allows the unique capability for deep, narrow welds with very small heat affected zones (HAZ) and minimized thermal distortions of welded assemblies. Depth-to-width ratios of up to 40:1 have been achieved in production for many years.

### WELDING PROCESSING CAPABILITIES

- Clean Room Environments
- Certified Class 100 and Class 1000 Welding
- 45 mA/160 kV - 7 kW power
- Rectangular part size: 22" long x 16" deep x 12" high
- Cylindrical part size: 22" with axis horizontal, 12" with axis vertical
- Eccentric table for: multiple circular welds; circular welds on large parts
- Up to 2" inch deep for steel
- CNC with 5 axes moving freedom: X-Y table, vertical Z axis, C rotary positioner, B tilt axis and beam deflector
- Electron Beam Weld (EBW)
- Gas Tungsten Arc Weld (GTAW)
- Irregular (Non-Circular) Welding
- Laser Weld
- Automated Micro Plasma Arc Weld (PAW)
- Automated and Semi-Automated Orbital Arc Weld

### BENEFITS OF ELECTRON BEAM WELDING

- High Efficiency
- Pinpoint Control
- Cleaner Welds
- Stronger Welds
- Variety of Beam Patterns & Weld Shapes
- Thin-Gauge Welding
- Extremely Small, Thin Parts can be Welded to Heavy Sections
- Beam Deflection is Unique Property to EB
- High Welding Speeds - 20/100 ipm (inch per minute)
- Normally Inaccessible Joints can be Welded
- Dissimilar Metals can be Welded
- High Reactive & Refractory Materials
- Low Distortion
- Computer Controlled
- Can Eliminate Secondary Operations
- Ultra Precision
- Deep Weld Depth
- Repeatable & Reproducible
- Tight Continuous Weld
- No Filler Metal Required



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