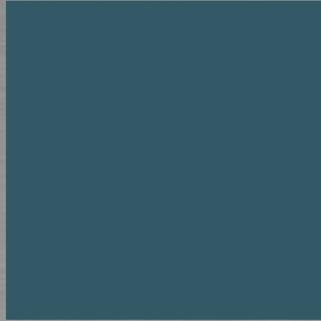
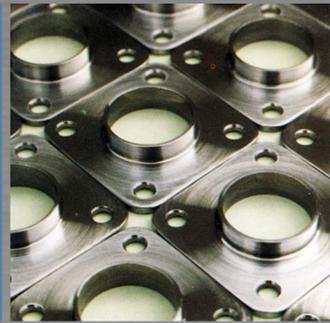
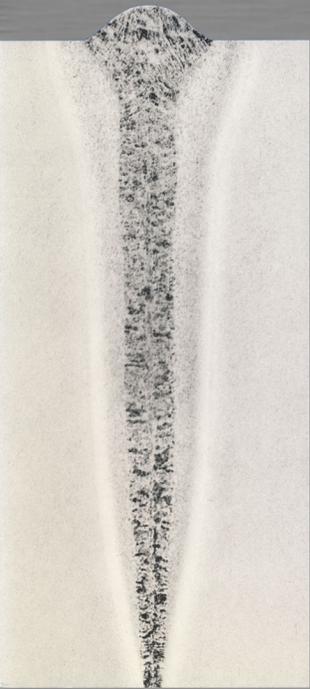


# ANDREWS HI TEC

C O R P O R A T I O N



electron beam welding  
since 1984



Andrews Hi-Tec Corporation was established in 1984 as a metal components processor specializing in electron beam welding. Our capabilities include manufacturing, assembly, testing and inspection. We have the in-house ability to design and build tooling and fixtures which results in the most efficient ways of improving your product, quality and timely completion.

## SOLVE YOUR PRODUCTION PROBLEMS WITH E.B. TECHNOLOGY!

**HIGH EFFICIENCY.** Electron beam welding produces about half as much waste heat as tungsten arc welding, to minimize distortion and metallurgical problems.

**PINPOINT CONTROL.** Width of weld can be focused almost to a hairline, or broadened as desired.

**CLEANER WELDS.** Welds are performed in vacuum (a high purity environment). This produces welds as clean or cleaner than original material. Oxides, nitrides and carbides are flushed out by heat and vacuum.

**STRONGER WELDS.** Physical and mechanical properties of electron beam welded samples are typically better than welds made with other processes.

**HIGH REACTIVE & REFRACTORY MATERIALS** can be welded successfully.

**THIN-GAUGE WELDING.** Edge and butt-welds can be made in metals as thin as 0.001 inch.

**DISSIMILAR METALS CAN BE WELDED.**

**EXTREMELY SMALL, THIN PARTS** can be welded to heavy sections.

**HIGH SPEED.** Higher welding speeds compared to other welding processes.

**LOW DISTORTION.** Low Distortion and heat damage. Low heat generation at very specific areas resulting in a narrow zone of heat flow.

**COMPUTER CONTROLLED.** Computer controlled equipment gives ability to weld complex geometries and a controlled repeatability.

**ULTRA PRECISION.** Allowing narrow access capability for the most demanding job.

**DEEP WELD DEPTH.** Deep penetration with a narrow fusion zone. Accurately controllable depth-to-width ratio.

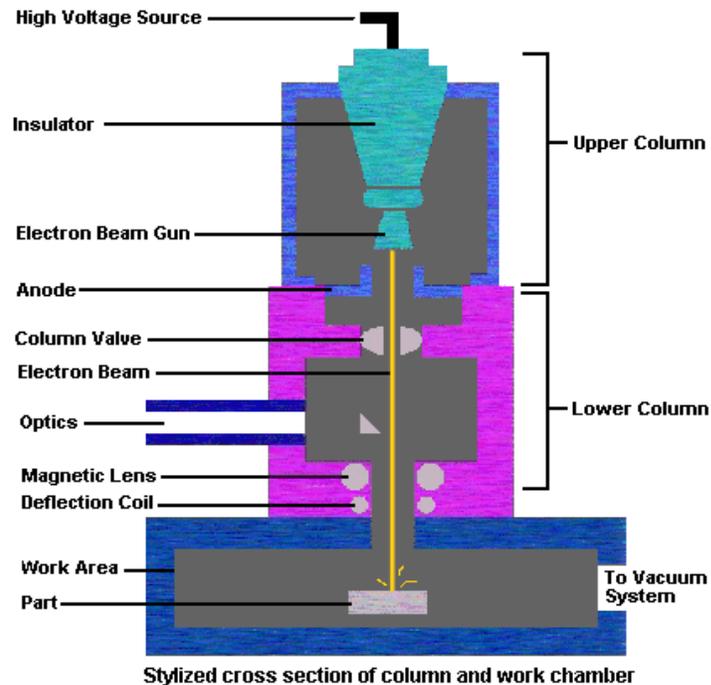
Any company that has a metal joining problem should contact our manufacturing engineer for more information. Advice and literature are available.



Our employees take pride in contributing their enthusiasm, integrity and skills in maintaining Andrews Hi-Tec Corporation as a worldwide recognized electron beam welding source to the aerospace, medical, defense, and commercial industries.

# THE ELECTRON BEAM WELDING PROCESS EXPLAINED

Electrons are generated by heating the filament located in the electron beam gun (grid). Because of the special design of this gun, the electrons are shaped to form the electron beam. The beam then travels through the following:



- > Anode
- > Column Valve
- > Magnetic Lens
- > Deflection Coil

...and then enters the chamber work area to the part.

The stream of high voltage electrons is accelerated to a velocity of approximately 2/3 (two thirds) the speed of light or about 117,000 miles per second.

This concentrated stream of high velocity electrons generates kinetic energy upon impact with the metal part, creating thermal energy (heat) resulting in fusion or melting of the two pieces to be joined. The machine operator views the welding operation directly through optics or remotely through a CCTV attachment.

The basic operation of welding a part is as follows:

Load part or parts in a fixture which is mounted to the base table in the work area of the vacuum chamber.

- 1- Pump the chamber down to a vacuum level of approximately  $10^{-4}$  mm Hg.
- 2- Initiate stream of electrons on target to set the meters, then re-initiate the beam on a part & weld.
- 3- Vent the chamber to atmospheric pressure and remove the welded part.

This unique and impressive process does the 'impossible' by welding a complete range of thicknesses from foils to thick plate and welds nearly all metal alloys, including the refractory materials like columbium or tantalum without concern of oxidizing the melted metal.



Please visit us online <http://www.ahtc.com>

QUALITY  
•  
DEPENDABILITY  
•  
SERVICE



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