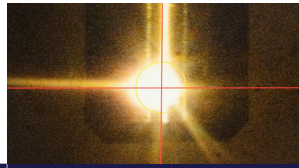


Electron Beam, Laser Welding and TIG Welding: What's Best For You?



Feature	Electron Beam Welding (EBW)	Laser Beam Welding (LBW)	Tungsten Inert Gas (TIG) Welding
Energy Source	Focused electron beam	High energy laser beam	Electric arc
Shielding Method	Vacuum environment	Shielding gas (argon/helium)	Shielding gas (argon/helium)
Weld Penetration	Deep (up to 2 inches in a single pass)	Moderate to deep (determined by type of laser)	Shallow to moderate
Weld Speed	High	Very High	Slower
Heat-Affected Zone	Smallest due to the vacuum environment	Small to moderate	Controllable with adjustable heat source
Material Compatibility	Most metals, including refractory and dissimilar metals	Most metals, including titanium, stainless steel, and aluminum	Wide range of metals, including ferrous and non-ferrous metals, can work with crack-sensitive materials and weld difficult-to-access joints
Welding Crack-Sensitive Material	Filler required and labor-intensive	Filler required and labor-intensive	Filler not needed
Fixturing	Required	Required	Not required, can weld in complex geometries
Forming Fillet Welds	Not an ideal process	Not an ideal process	Forms strongest fillet welds
Distortion and Stress	Low to moderate	Minimal	Minimal on thin gauge metals due to control of heat source
Automation Suitability	Easily automated	Easily automated	Typically, manually controlled
Cost Effectiveness	High	Moderate	Low setup cost