

Material Welding Guidelines for Laser & Electron Beam Welding.

Aluminum	4047 to 4047	Weldable
	2219 to 4047	Weldable
	1100 to 4047	Weldable
	6061 to 4047	Weldable
	2219 to 2219	Weldable
	1100 to 2219	Weldable
	6061 to 6061	Weldable only with filler (such as 4047)
	7000 Series	Unweldable
	2000 Series	Some are weldable 2219 & 2024
5000 Series	Some are weldable 5052 & 5086	
Beryllium	Requires special techniques but can be electron beam welded. This welding is toxic and requires special enclosures & ventilation	
Beryllium Copper	Welds well, needs deoxidizing	
Cast iron	All unweldable	
Copper	Welds fair, porosity may be a problem. Needs a lot of power to overcome heat conduction.	
Gold	Weldable	
Hastelloy	Welds well	
Inconel	Welds well	
Kovar	Welds well if not plated. Nickel & gold plating causes cracks.	
Magnesium Alloys	Welds with special techniques	
Molybdenum	Brittle welds, but sound joints	
Monel	Good ductile welds	
Nickel	Good ductile welds	
Nickel alloys	Most weld well	
Platinum	Weldable	
PH Steels	All weld well with special techniques.	
Silver	Weldable	
Stainless Steel	300 series - welds well, except 303 and 347. Note that 304 is preferable to 316. 400 series – welds somewhat brittle.	
Steel-Low Carbon	Below 0.2% carbon is weldable	
Steel-Medium Carbon	Between 0.2% and 0.5% carbon maybe weldable but will require preheat and post heat.	
Steel- High Carbon	Over 0.5% carbon considered unweldable without special techniques.	
Tantalum	Good ductile welds	
Titanium	Good ductile welds	
Tungsten	Welds fair - may be brittle.	
Zinc Alloys	Not weldable due to outgassing	
Zirconium	Good ductile welds.	
Dissimilar Metals	Call our specialists for advice on welding dissimilar metal weld joints.	

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