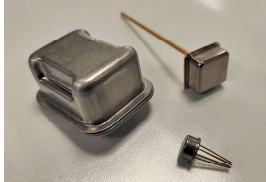


Feature	Resistance welding		Laser welding		Cold welding
	Seam welding	Projection welding	Pulse (Nd:YAG) laser	Continuous Wave (CW) fibre laser	
Feature	Parallel electrode rolling alongside weld path	Vertical electrodes single time weld	Fixed optic, moving x/y table	Oscillation welding + fix or moving x/y table	High pressure welding
					
Typical Packages					
Exemple of packages and / or metals weldability	Preferrably Kovar packages	<ul style="list-style-type: none"> • Transistor device packages TO 18, 72, 5, 39, 8, 66 & 3 • Power device packages DO4, 5, EI2, I4, I5, & Pucks • Crystal device packages UM 1, HC 49, 45, 18, 6, DIL 4 & ½ DIL • Hybrid device packages DIL I4, 16, 24 • Special device packages TO 220, Quad packs, m/wave diode 	<p>Most metals can be welded / cutted with a Yag laser</p> <p>Aluminium</p> <ul style="list-style-type: none"> • Stainless Steel • Low Carbon Steels • Kovar • Copper • Nickel/ Nickel Iron and Copra Nickel • Monel • Beryllium Copper • Phosphor Bronze • Hastelloy • Molybdenum • Titanium • Tantalum • Zircalloy • Silicon Wafers 	<p>Most metals can be welded with a fibre laser, a few metals that has proven weldability:</p> <ul style="list-style-type: none"> • Aluminium grade 4047 to 6061 • Silicone Aluminium • Stainless steel grade 304, 316 • Titanium alloy Ti-6Al-4V • Brass 95/5 • Kovar ... 	<ul style="list-style-type: none"> • Transistor device packages TO 18, 72, 5, 39, 8, 66 & 3 • Power device packages DO4, 5, EI2, I4, I5, & Pucks • Crystal device packages UM 1, HC 49, 45, 18, 6, DIL 4 & ½ DIL • Hybrid device packages DIL I4, 16, 24 • Special device packages TO 220, Quad packs, m/wave diode
Pros	<ul style="list-style-type: none"> • Suitable for square, rectangular, vertical lead and circular packages with dimensional range between 2 to 152 mm, with plain or step lids up to 0.5 mm thick. • Excellent positionnal accuracy < to ± 0.025 mm • Designed to achieve high quality, repeatable production sealing of hybrid style packages 	<ul style="list-style-type: none"> • Proven technology with a long record of packages in the industry already welded with this technique • Can weld under specific atmosphere with stainless steel vacuum chamber 	<ul style="list-style-type: none"> • Reliability • Minimal heat distortion • Deep penetration welds and cutting thicknesses. • Non-contact process. • Process different materials and complex shapes. • Readily automated. 	<ul style="list-style-type: none"> • Reliability and long lasting components • High flexibility and weld control (weld depth, width, speed) • Maximum control of heat input • Deep penetration welds and cutting thicknesses. • High processing speeds. • High power efficiency • Non-contact process. • Process different materials and complex shapes. • Readily automated. 	<ul style="list-style-type: none"> • No heat input just high pressure on a profiled package • Proven technology with a long record of packages in the industry already welded with this technique • Can weld under specific atmosphere with stainless steel vacuum chamber
Cons	<ul style="list-style-type: none"> • Process limited to certain shape of packages (rectangular or circular) • Process limited to a certain type of materials (Kovar like and / or resistives metals) and specific design 	<ul style="list-style-type: none"> • Require specific package design (projection) to weld 	<ul style="list-style-type: none"> • Spare parts requirements (flash lamp) • Bigger footprint 	<ul style="list-style-type: none"> • New technique 	<ul style="list-style-type: none"> • Require specific package design (projection) to weld