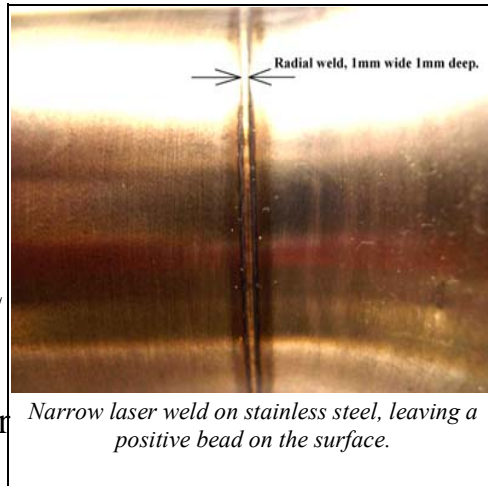


Production Welding at Carr's.

Several companies now use Carr's for welding stainless steel bodies together. Up to 2mm penetration is easily achieved and when welded all round a diameter, this makes a very strong joint. With good fit up there is less than a millimetre wide bead on the surface, which some leave for extra strength but some polish off, to leave a seamless joint.

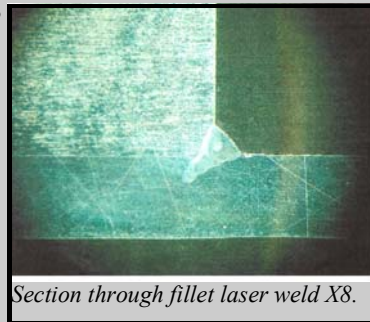
Clean stainless steel:- 304L, 303L or 316L all weld nicely. If well degreased and no gaps, the laser leaves a positive bead, as if a filler wire had been added.



Need a round part welding? Ring Phil on 01536 412828.

Welding with no filler?

Laser welding is good, even brilliant, but some features border on the miraculous. This fillet weld in stainless 304L was welded at 50mm per second and clearly shows extra material in the joint where the tube meets the boss. The joint is a good fit prior to welding, but after welding there is extra material in the fillet, this gives extra strength with no undercut and no filler being added. This feature can be very useful when welding steel parts together.



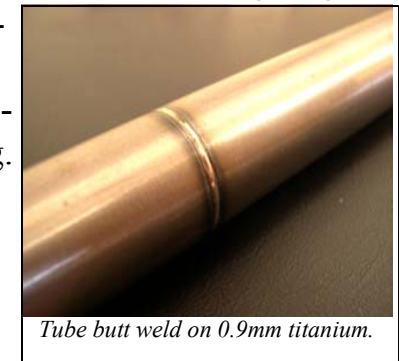
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Titanium and its alloys are tricky to weld. This highly reactive metal absorbs water and oxygen like a sponge and when hot, easily oxidises and can crack. Laser welding of Titanium, whatever grade usually 1 to 5, is the easiest way to join this alloy, due to the incredibly low heat input.



Thin sections and assemblies can be welded at 2 metres per minute, so the whole assembly does not get the chance to heat up, as it would when conventionally welded. Conventional Tig or Mig welding, has made a generation of engineers nervous about welding Titanium. Designers have always been cautious about making complicated parts, if the risk of scrapping them at the welding stage is high. However, the laser welds thin section titanium really well, leaving only a slight sootiness to the weld. No heat discoloration is present with laser welding. This means the welds are sound and crack free.

More info on www.carrswelding.co.uk



Titanium Welding continued.

Application story.

Imperial college in London is participating in the Laser Interferometer Space Antenna (LISA) Pathfinder, and is in charge of controlling the electrostatic charge on two free floating test masses. The test masses are located inside an Ultra High Vacuum chamber, where they are shielded from unwanted disturbances. Titanium feed-throughs are being developed by ICL, together with Carr's Welding and Oxford Electronics, in order to deliver the UV light from outside the vacuum chamber to the test masses. The manufacture of these feed-throughs involves welding two Titanium components together, with the UV filter already in place with an epoxy. Specific requirements on the welding are:

- the temperature rise is limited to the temperature range of the epoxy, that holds in the fibre,
- the welded joint needs to be leak-tight,
- the joint needs to be sufficiently strong for the feed-through to survive launch vibrations.

Laser beam welding, as apposed to other welding methods, offers very localised, controlled heating. Several Titanium feed-through prototypes have now been successfully welded by Carr's Welding. No damage to the epoxy was detected, and leak tests have been successful.



Need neat repeatable welds? Come to Carr's.

Personnel Story.

Geoff Long.



Geoff in the Kuka robot laser cell.

Geoff joined Carr's in 2005 as an accounts assistant. Geoff soon showed his true colours for software programming, not just with sage, but also with the Kuka robot. Now, still only a year at Carr's, Geoff is controlling the robot to laser weld production jobs. Welds are always closely scrutinised by a fully trained member of staff, while Geoff continues his training. This ensures the procedure can be approved under Carr's normal ISO 9001/2000 standards. Once programmed the robot repeats welds to 0.1mm accuracy.

Quality Corner.

Carr's have introduced a welding procedure, for all their repeat jobs. This document details every operation, so that each job is carried out the same way every time we weld it. Once issued each procedure has to be approved by the customer. Just another way of keeping high quality products.

Quality is still King at Carr's



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