

Laser Welding of Endoscopes and Other Reusable Devices

Challenge

Manufacturers of rigid endoscopes need fabrication methods that enable their products to withstand multiple re-sterilization cycles without leading to corrosion. These are fabricated from small thin-walled metal tubes and sheets that therefore cannot be joined using adhesives or brazing/soldering.

Solution

Laser welding is now well-established as an ideal solution. Coherent offers laser systems that are exactly tailored to this application and yet are open for further medical device applications. The laser solutions for this application start from systems with simple manual control for the production of single unit prototypes, all the way to fully automated CNC production tools. These are capable of creating spot welds, seam welds and gas-tight welds far less than 1 mm in size, with excellent surface quality that does not require any post-processing. And because the pulsed laser can be focused to a very small spot - < 0.1 mm diameter with our MicroWeld™ technology - the welding process does not cause significant heating to the surrounding metal substrate. Coherent offers three different types of integrated systems that provide cost-optimized functionality for various levels of the medical life cycle: from initial prototypes through routine production. These systems can be defined by their level of automation:

Performance Unlimited – manual welding system

Select – semi-automated system with 4 axis motion control

ExactWeld – fully automated CNC-type machine

Benefit

By lowering the barriers to the process, these tools enable both experts and newcomers alike to exploit all the inherent advances of this unique and flexible joining technology.

These simple to use laser-based tools enable manual or fully automated welding of stainless steel tubes and sheets, with the requisite precision and surface quality that this application requires, with a choice of cost levels to match your specific needs.

Application Field

Welding stainless steel endoscopes and other re-usable medical devices.



Figure 1. MicroWeld™ enables welding spot diameters as small as 0.1 mm supporting fine welds with minimal peripheral thermal loading.



Figure 2. Laser systems with up to three levels of automation: manual, semi-automated with 4 axis motion control and fully automated

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