On-line seam tracking for remote applications

TRUMPF

Machine tools/Power tools
Laser technology/Electronics

Weight and cost reduction via remote welding.

Reducing weight and material increases energy efficiency and saves costs. With remote welding, for instance, you can reduce the flange material by replacing an overlap weld by a fillet weld. Fillet welds require very precise positioning accuracy of the laser beam. The laser has to make very accurate contact with the seam location between the two metal sheets so that the fillet weld can be properly generated without the need for filler material.

On-line seam tracking: Your benefits at a glance.

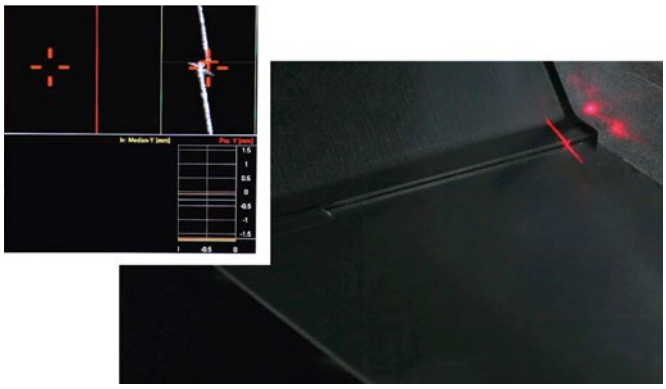
1. Remote welding for weight and cost reduction.
2. Efficient welding of fillet welds.
3. On-line detection and control of seam position.

Detecting the seam and the position of the focus point.

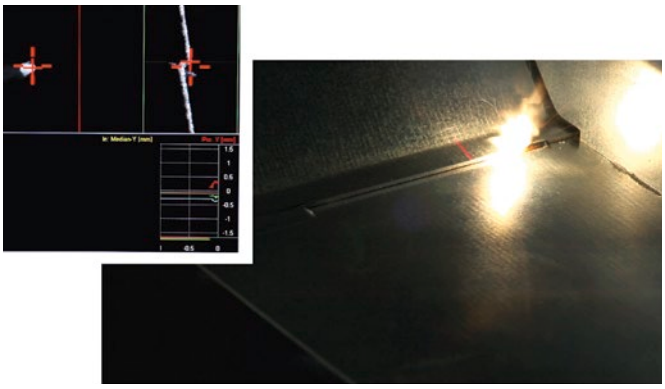
The sensor system for on-line seam detection fulfills these requirements. A high-speed camera, coaxially arranged on the programmable focusing optics PFO 3D-2, simultaneously detects the seam and the position of the focus point and controls the precise positioning – so that the laser beam always hits the seam exactly at the target location.

On-line detection of seam position.

During welding with the programmable focusing optics PFO 3D-2, the sensor system for online seam detection detects both the joint gap as well as the current position of the focus point, and after the welding process it supplies data on the weld seam position that has actually been reached. This is especially interesting for the automotive industry, because using the programmable focusing optics PFO 3D-2 in combination with robots enables both overlap welds and fillet welds to be carried out within just one process cycle – very simply, and without any need to change the optics.



Fillet welding with position control (sensor runs ahead).



Fillet welding with position control: measurement of target position and actual position during welding.

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