J. Drechsel, H. Exner

Processing Heads for Hand Guided Laser Material Processing

The Laserinstitut Mittelsachsen has extensive experience in the area of hand guided laser material processing. Since 1998 hand-held processing heads with their corresponding optics were developed and realized in the course of various research projects in cooperation with industrial partners. Developments originated from a R&D project in the progress of which a mobile laser welding system for hand-held laser welding was realized on the basis of a fiber coupled high power diode laser. The hand-held processing head developed for this purpose is dimensioned for powers up to 2kW; it is equipped with an integrated laser power control (Fig. 1). Process gas is supplied through the process head. The process can be observed via the TFT-monitor attached to the head, which is mounted to the hand-held processing head in a way that allows pivoting up to 90° in both directions and thus can be read well in any welding position. The intended laser program can be adjusted via the hand-held head. During the welding process the operator is informed if the processing head advances within the correct speed range. In this range, the laser power is adjusted automatically. The shape of the head allows for the application in fillet welding (insert upper left corner Fig. 1).

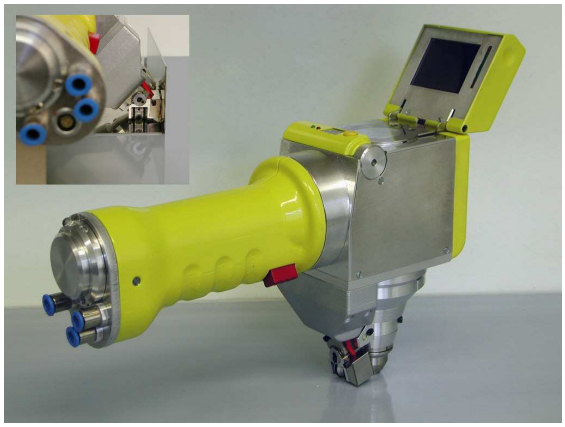

Fig. 1: Hand-Held Processing Head for Fiber-Coupled High Power Diode Lasers

Latest development is a hand-held processing head for Nd:YAG-lasers. According to the development concept a series of safety features was integrated into the functions of the processing head.

Integrated process gas feeding and – already realized with the hand-held high power diode laser – integrated process observation (IPV©) as well as the safety control are considered the advantages of this compact laser welding head (Fig. 2).

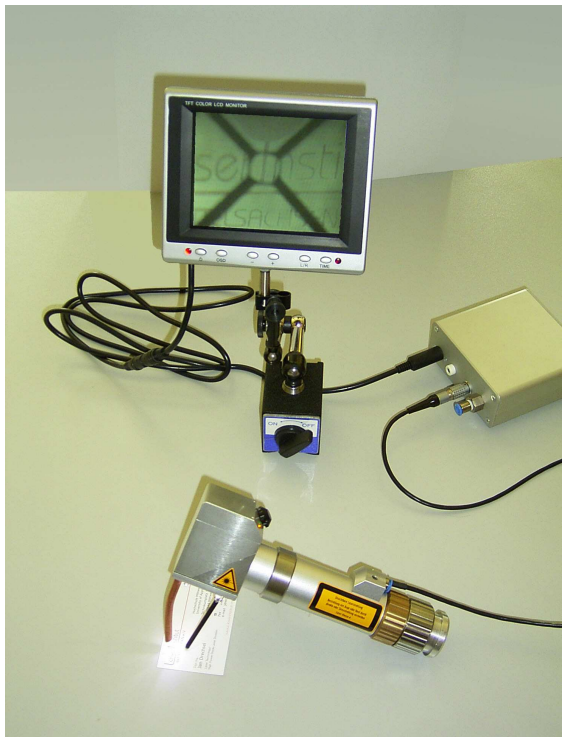

Fig. 2: Hand-Held Processing Head for Fiber-Coupled Nd:YAG-Lasers or fiber lasers

Additionally here too, the operator has the choice to select via the processing head from several predefined laser process programs. Emerging from this basic model, further stages of development are projected for the application in other laser processing techniques.
The hand-held processing head is presently in use for laser cladding with cladding wire. Complete solutions and laser systems can be purchased from LASERVORM GmbH Mittweida.

Contact:
Dipl.-Ing. J. Drechsel, Tel. 03727 581572
e-mail: jdrechse@htwm.de