

Optical Sensor Packaging for Monitoring Industrial Laser Processing

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Abstract:

In industrial laser processing, the monitoring of the correct behaviour of the process by the acquisition of process relevant optical and other signals is becoming more and more important, for its use in process control and traceability or even for closed loop active process control. In the dilemma between a restrictively standardised hardware solution and individual optimised process adapted solutions, the "optical surface mounted device", OSMD principle presents a valuable issue. The method is based on a standardised tripod optics holder, accepting optical elements such as lenses, mirrors, beam splitters, etc, but also detectors and semiconductor lasers, and a computer controlled robotic assembly of these tripods onto a metallic breadboard. The tripods, equipped with their optical elements, are the successively positioned according to a specific active alignment strategy and laser spot welded onto the breadboard with a simultaneous triple laser shot onto the three legs of the tripod. The breadboard can be equipped with standardised optical and electrical interfaces and constitutes a specified and interchangeable block in the laser process control chain. Two examples of applications will be shown.