



WP5 – COST EFFICIENT SYSTEMS FOR POLYMER WELDING

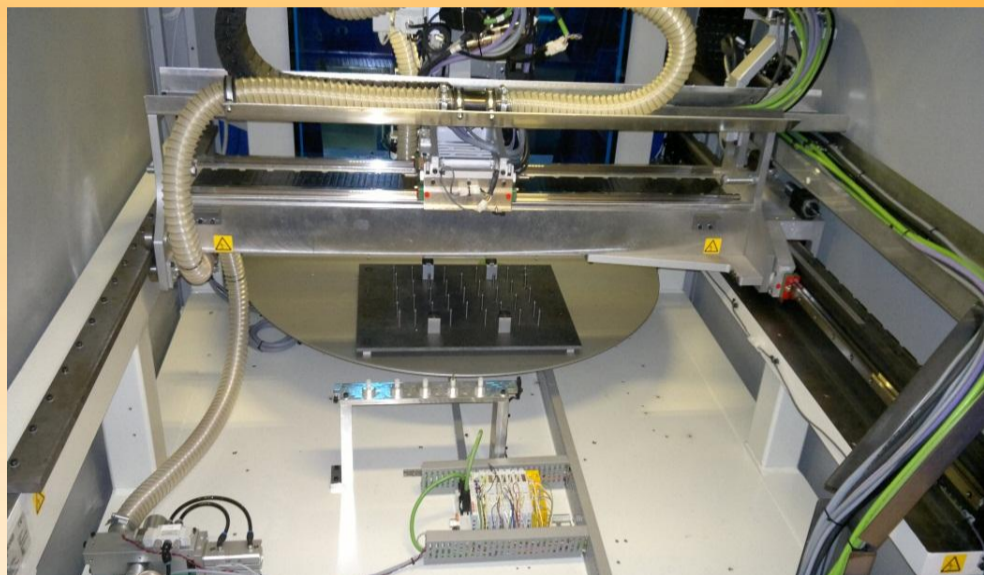


ABSTRACT

Cencorp is developing a laser platform for laser welding of plastics. The system is based on a industrial three axis robot, moving a galvanometric scanner along the work area, or to use the scanner for oscillating the laser beam to control the thermal gradient across the weld and create the geometric shape of the weld by moving x, y, z axes.



Cencorp machine industrial design



Linear motor concept suitable for plastic welding system with enhanced work envelope

METHOD

Plastic welding with high brightness lasers using galvanometric scanners is a fast method for contour or quasi-simultaneous welding. However, using only conventional optical axes, the size of the parts is limited by the scanner working area. Larger field of view is obtainable using a longer focal length, with the expense of motion accuracy and bigger focal spot size. Using a galvo head mounted on mechanical axes makes it possible to utilize the combination of optical and mechanical axes. For the prototype system built within the PolyBright project, loading will be carried out manually. However, this approach also facilitates the use of rotary tables, dual fixtures, shuttles or in-line operation.

HIGHLIGHTS

Cencorp's extended work area concept offers (preliminary specifications):

- Up to 210 x 210 mm² field of view / 550 x 450 x 200 mm³ motion system
- Fiber or diode laser
- Ethercat-based motion controls (beam oscillation + contour motion)
- Optional weld quality control
- Quasi-simultaneous welding
- Contour welding, TWIST welding
- Suitable for large components
- High number of components weldable in one stroke

OUTLOOK

- Enhanced work envelope system reveals high format flexibility and processing variations for laser welding than conventional welding systems
- Suited for high throughput manufacturing with high duty cycle
- Load/unload times are minimized

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