INDUSTRIAL TECHNOLOGY OF LASER CLADDING AND WELDING FOR AUTOMOTIVE APPLICATIONS

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In this paper is presenting the evolution underwent by the technology during the last decade facilitated the design and construction of high power laser for industrial applications. The metal treating is one of the main domains that gained due to the technological progress, I.e welding, cutting, drilling and laser cladding. Thanks to the constant progress, the laser welding and cladding technology is soon to become a feasible alternative for the automotive and aviation industry.

Over the past years, the laser welding and cladding technology has benefited together with the laser cutting and marking of a significant progress, being recognized and used for its real value, thus obtaining quality products with lower costs. The laser welding technology can be used for micro joints as well as for thicker parts (25...30mm).Hybrid laser-arc welding introduces a secondary energy source to the weld pool area (see Figure 7). It combines typical laser welding benefits—high travel speeds, limited heat-affected zone (HAZ), narrow weld joint, and good bead appearance with those of gas metal arc welding (GMAW): process energy efficiency, gap-bridging, slow cooling rates, and energy coupling efficiency.

The GMAW wire can be introduced before or after the laser beam. Laser beam attenuation (scattering and absorption) caused by vapor particles evacuating the keyhole or weld area reduces the amount of beam energy coupled to the base material. [3]

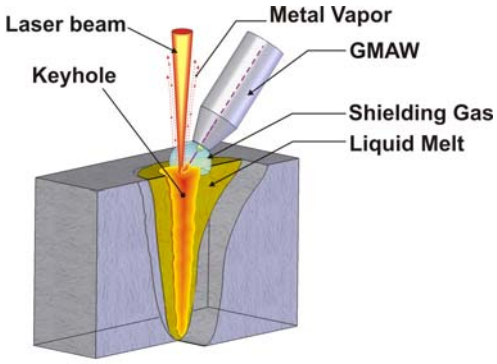

Figure 7 Hybrid laser-arc welding; GMAW: Mig, Mag, Paw; Laser beam: CO_2, Nd: YAG, High-power Diode; Shielding Gas: argon or helium.

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