

Pulsed Nd: YAG Laser Parameters Effect on Welding Uncoated Advance High Strength Steel (AHSS) for Automotive

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Abstract:

Pulse wave (PW) welding technique has become more adequate process to produce a deep penetration welding with smaller fusion zone and heat affected zone for automotive steel joint. A 1.6 mm thickness of N22CB boron steel from advance high strength steel (AHSS) type was welded by using PW mode from a low power Nd: YAG laser. The process parameters studied in this paper are pulsed energy, E_p , focal length, F , and welding speed, S . Bead-on-plate (BOP) welding was used in this experiment. The effect of parameters on the weld pool geometry was studied. Higher pulsed energy gives high weld penetration and higher weld width, contributing to the bigger weld pool size. Positive defocus position of focal length produces weld geometry with high penetration depth and smaller bead width compared to negative defocus position. Lower welding speed could produce deep penetration depth as the high heat input produced.

Keywords: Low power laser; Pulse wave mode; Parameter effects

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