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Alloying of AISI 1008 Steel Surfaces by 10ms Nd: YAG Laser Pulses

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**Abstract:** Hardened surfaces were produced on AISI 1008 steel through a laser surface alloying (LSA) technique. Mixture of pure Boron, Silicon, and Carbon powders of the same grain size were deposited on the substrate. The surface was then melted using pulsed Nd:YAG laser ( $\tau = 10$  ms) at an energy of 12 J. The influence of alloying elements on the microstructure and hardness of treated layer was investigated. Depending on the alloying elements species, different maximum surface hardness, different maximum depth, and different hardness profile could be obtained. The B+Si alloyed zone exhibited maximum hardness to a nominal alloying depth of  $350 \mu\text{m}$ .

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