
Research of steel sheets precision slot cutting of large calibers using single-mode fiber laser

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Research results of precision slot cutting in mild steel sheets (thickness up to 10 mm) using 1 kW power single-mode fiber laser were presented. In case of using pulse-repetition regime of single-mode fiber laser and oxygen, the number of slot calibers was achieved up to 70 (width of slot up to 60 μm). The cutting speed (100...50 mm/min), surface roughness, steel phase structure and hardness of cutting surface were measured. Efficiency (≈3 %) of precise cutting, transportation efficiency (25 %) in waveguide regime was estimated. A qualitative model of the laser-oxygen cutting in case of large number calibers of slots was proposed.

Keywords: *laser cutting, fiber laser, precision cutting, mild steel, experiment, speed of cutting, width of slot, caliber cannulation of slot, surface of cut, roughness, hardness, phase structure.*

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