Influence of temperature and speed of the laser head on the final structure surface hardened steel ČSN 12050 (EN 10083-2 steel 1.1191)

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Abstract:

Laser technologies are listed as unconventional methods of machining and heat treatment, which allows many advantages. In the area of heat treatment the laser technology allows a wide range of surface hardening. It provides a very fast and effective approach where the region of influence of the material is quit narrow. It is also possible to hardening parts and materials which were not possible to process with the conventional processes. To get the required depth and quality of the hardened layer it is necessary to set up properly the laser process parameters (temperature in the process area, feed rate of the laser head, etc.), which varies for different materials. The paper presents a test for optimal process parameters for surface hardening of the material ČSN 12050 (EN 10083-2 steel 1.1191). The surface structure for temperatures of 900, 1100, 1200 and 1300°C and laser head feed rates of 0.003, 0.005 and 0.007 m/s were tested. Best results were obtained for a temperature of 1300°C and a feed rates of 0.003 m/s.

Key words:

Laser, heat treatment, surface hardening, unconventional methods