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OPTIMISATION OF LASER HARDENING PARAMETERS FOR TURBINE BLADE STEELS

A 4.4 kW Sinar continuous wave Nd: YAG solid-state laser was used for laser hardening of turbine blade steel (chemical composition: 0.19%C; 0.32%Si; 0.38%Mn; 0.01%P; 0.002%S, 12.72%Cr, 0.41%Ni). The laser processing parameter i.e. scan speed and laser power were varied while the temperature was held constant 1050°C. The characterisation of the hardened surfaces was carried out by Optical Microscopy (OPM), Scanning Electron Microscopy (SEM/EDS) and X-ray Diffraction (XRD). Hardness measurements were carried out, a through-thickness hardness profile (indentations from the surface of the alloyed layer through to the base) was determined with a 1

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