

Master 2017

Rakesh Mukeshbhai Sorathiya

Surface Integrity of 42CrMo4 Steel induced by Shortpulse-Laser Turning.

ABSTRACT - Masterthesis

An experimental study was carried out to investigate the effect of process parameters on surface integrity. The influence of laser parameters such as laser power, repetition rate and pulse duration was observed on residual stress, microstructure and crystal orientation. Also, the rotation speed showed a more impact on characteristics of surface integrity. The results suggested, lower rotation speed has generated more deformation of microstructure and residual stress was increasing with less rotation speed. The residual stress was measured by standard X-ray diffraction, which was found as compressive residual stress after laser processing. Electron backscatter is used for analysis of phase transformation and crystal orientation, which indicated the presence of retained austenite. This study presents the current understanding regarding the surface integrity of 42CrMo4 steel.