

عنوان مقاله:

Laser Surface Hardening Process, Considering Finite Element Method

محل انتشار:

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خلاصه مقاله:

Technological advances necessitate the use of material in increasingly extreme and aggressive conditions, such as corrosive atmospheres and abrasive wear situations. Laser hardening is widely used to improve the mechanical properties of highly stressed, ferrous and non ferrous machine parts. Surface hardening increases wear resistance and fatigue life through micro structural changes induced in the metal surface during laser processing[1]. Output beams are easily shaped by optical components into squares, circles, lines or into more complex axi-symmetric shapes for special purposes. This makes it easy to heat treat not only flat surfaces, but also complex curved surface, such as bearing races, gears, shafts, cylinders, camshafts and so on. Pulsed laser surface modification has been identified as one of the promising technologies for enhancing surface properties. This technique includes shock and pulsed transformation hardening. In this paper considering temperature and pressure dependent material constants, stress and strain fields are illustrated. It is shown that compressive residual stress would occur near the surface as a result of laser shock surface treatment. Compressive residual stress may improve surface hardening and fatigue life.

کلمات کلیدی:

Laser Shock, Wave, Hardening, Thermoelastoplasticity

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