

Induction hardening of steels with use of the device for incremental forming of round bars HDQT-R 30-12

Corresponding author:

Michal Peković, pekovicm@rti.zcu.cz, University of West Bohemia, Regional Technological Institute

Co-authors:

Jiří Vrtáček, Tomáš Janda, Julie Volkmannová

Abstract:

Induction hardening technology is mainly used for processing parts where high hardness, as well as wear-resistance and ductile core, is required. Normally induction hardening is used for spur gears, wind turbine rings, and bearings. Innovative induction hardening processes are also developed for complex automotive components such as camshafts and crankshafts. In this process, steel is heated by passing high-frequency alternating current through a coil which is considered as the primary winding of the transformer. The area where heat-treated material lies or passing through is considered as a short circuit secondary winding. Device for incremental forming of round bars HDQT-R 30-12 is equipped with such heat treatment modules which can be used for heat treatment after rolling of rods or even without rolling. Heating of steel bars is provided by five induction coils, which can heat the material faster than the chamber furnace, and there is less oxidation of the material surface. This paper shows the microstructural and hardness results from testing 42CrMo4 steel, 13CrMo4 steel, and S235JR steel after heating at different inductor coil power settings with subsequent hardening into the water bath.

Key words:

Induction hardening, quenching, AHSS, hardness