Mechanical Properties Improvement of CK45 Steel with Transmuting the Surface Structure to Nanostructure by Using Ultrasonic Technique

Recently some investigations have been performed in the field of ultrasonic technology for improving the nano surface characteristic. Ultrasonic Cold Forging Technology (UCFT) is a severe plastic deformation which accomplishes with nano structure of surface layers by Hall-Petch theory and ultrasonic technique that increases mechanical properties of the materials. At this technology according to Hall-Petch theory both toughness and hardness will augment simultaneously with severe plastic deformation, then will contribute to nanostructure of surface layers and increase the metal strength. At this study, basic principle of UCFT and related experiences on CK45 steel were took into account in view of previous setup and research. Consequences indicated the rising in tensile strength, hardness surface improvement and reduction in surface roughness and friction coefficient. Aforesaid technology has low energy consumption and without any limitation in part dimensions can be a replacement of heat surface treatment

Ultrasonic, Nanostructure, Mechanical properties, UCFT, CK45 steel