MECHANICAL PROPERTIES OF BEARING STEEL AFTER AUSTEMPERING HEAT TREATMENT

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Abstract

In this work, the microstructure and mechanical properties of 100CrMnSi6-4 bearing steel after austempering heat treatment has been studied. Steel samples have been subjected to austenitisation followed by quenching and isothermal annealing at various temperatures in the bainitic transformation zone. After heat treatment the microstructure of the samples was investigated by means of transmission electron microscopy (TEM). It was revealed, that depending on parameters of the isothermal process two kinds of bainitic microstructure were formed: lower bainite at 260 ^{o}C and nanobainite at 320 ^{o}C. The mechanical properties of the heat treated samples have been investigated by use of: hardness test, Charpy impact test and static tensile test. It was found, that the 100CrMnSi6-4 steel with the nanobainitic microstructure exhibited higher strength along with the relatively high ductility and impact strength as compared to the values reported for steel with lower bainite. However for steel with lower bainite the hardness reached higher value than in nanobainitic steel.

Keywords: Mechanical properties, austempering, nanobainite, lower bainite

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