

The Tribological Performance of Shot Peened AISI5160 Steel

CATEGORY OR KEYWORDS

Shot peening, Heat Treatment, Residual Stress, Wear and Friction Behavior

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INTRODUCTION

The effect of heat treatment on wear and friction performance of AISI 5160 steel was studied. The AISI 5160 steel samples were austempered at 288°C, 316°C, 343°C, 371°C, 399°C, 427°C, and 454°C for 2 hours until the bainite transformation was complete. In addition, the influence of shot peening on the wear and friction behavior of heat treated 5160 steel was studied. The microstructure, hardness, and residual stress of specimens were studied by optical microscopy, scanning electron microscopy, Vickers micro-hardness, 3D-profiler, and X-ray diffraction. Austempering temperatures of 288°C, 316°C, and 343°C produced lower bainite with better wear behavior than austempering temperature of 371°C, 399°C, 427°C, and 454°C which produced upper bainite. Moreover, shot peened specimens had better wear behavior than non-shot peened specimens for austempered temperatures from 288°C to 371°C. Abrasive wear was the primary wear mechanism for all test specimens.

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