

Austempering of Spheroidal Cast Iron.

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Abstract:

The effect of austempering on the hardness, ultimate tensile strength and per cent elongation of twenty pre-annealed unalloyed spheroidal cast iron specimens have been investigated and evaluated. The specimens were solution treated at 800°C and 900°C, each for 10 and 90 minutes, and isothermally transformed at 300°C and 400°C for 3 hours.

The test results indicated hardness and ultimate tensile strength improvements through variations in the three factors. Solution treatment at 900°C for 56.35 minutes followed by isothermal transformation at 352°C for 3 hours yielded a Brinell Hardness Number (BHN) of 315, which was much higher than an average Brinell Hardness Number of 157 obtained in the untreated specimens. Solution treatment temperature appeared to be the most potent of the three factors considered for hardness and strength improvements in the unalloyed spheroidal cast iron.

Isothermal transformation temperature exhibited the least positive effect on the mechanical properties tested within the range of temperatures investigated. The per cent elongations obtained at the improved strengths of the unalloyed spheroidal cast iron specimens are indicative of the overall effects of austempering on the mechanical properties.

Keywords: Spheroidal cast iron/ austempering/ isothermal transformation

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