

Mechanical properties of solid solution strengthened CGI

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The development of high-performing components is crucial in applications such as heavy vehicle automotive powertrains. In these applications, strength, weight and thermal conductivity is essential properties. Key materials that may fulfil these requirements include cast irons of different grades where in terms of manufacturability and in particular machinability pearlitic grades are difficult due to hardness variation, where a fully ferritic matrix would provide an advantage. To achieve maximum strength a fully ferritic and solid solution strengthened compacted graphite iron (CGI) would provide an interesting alternative to the automotive industry. In the current study, the effect of Si level on mechanical properties in a fully ferritic material was investigated. The influence of section thickness on tensile properties and hardness was investigated. The resulting material was fully ferritic with limited pearlite content. Section thickness influence on nodularity and hence the mechanical properties were also investigated.

Keywords: compacted graphite iron, high Si ferritic CGI, mechanical properties, solution hardening, ferrite

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