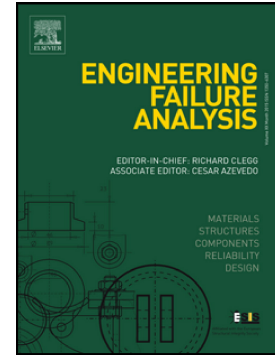


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**Mechanical and fatigue properties of pearlitic ductile iron castings characterized by long solidification times**

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**Abstract**

In this paper, the fatigue behaviour of heavy section pearlitic ductile iron castings has been investigated. The inoculation treatment has been changed for each casting in order to investigate its influence on the mechanical and fatigue properties of the materials.

Tensile tests and axial fatigue tests under nominal ratio  $R=0.01$  have been performed on specimens taken from the core of casting components characterized by long solidification times. Scanning Electron Microscopy have been used to investigate the fracture surface of the broken samples in order to identify crack initiation points and fracture mechanisms. Metallographic analyses have been carried out to measure nodule count and nodules dimensions and to identify matrices structures.

It has been found that fatigue behaviour is strongly influenced by defects, such as microshrinkages or degenerated graphite particles near to specimens' surface. It has been also found that inoculation

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