

Influence of Raw Material Composition on Microstructure and Mechanical Properties of Nodular Cast Iron

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Abstract : The aim of this study is to evaluate the influence of raw material composition on the microstructure, mechanical and fatigue properties and micromechanisms of failure of nodular cast iron. In order to evaluate the influence of charge composition, the structural analysis, mechanical and fatigue tests and micro fractographic analysis were carried out on specimens of ten melts with different charge compositions. The basic charge of individual melts was formed by a different ratio of pig iron and steel scrap and by different additive for regulation of chemical composition (silicon carbide or ferrosilicon). The results show differences in mechanical and fatigue properties, which are connected with the microstructure. SiC additive positively influences microstructure. Consequently, mechanical and fatigue properties of nodular cast iron are improved, especially in the melts with the higher ratio of steel scrap in the charge.

Keywords : nodular cast iron, silicon carbide, microstructure, mechanical properties

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