

The Occurrence and the Effect of Casting Skin in Compacted Graphite Iron

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Most iron castings retain their as-cast surfaces because of their geometric complexity and to minimize the machining costs. However, the mechanical properties that are documented in standards (*i.e.* ASTM) are tested on fully machined test bars. Therefore, the effect of the as-cast surface and sub-surface features (commonly referred as “casting skin”) on mechanical properties should be evaluated.

Preliminary works have shown the negative effect of the casting skin on mechanical properties of grey and ductile irons. This paper reviews the recent works on the casting skin effect on tensile and fatigue properties in compacted graphite and ductile irons. It was found that the tensile and fatigue strength were reduced by 9% and 40% respectively because of the presence of the casting skin. In addition, the correlations between processing parameters (*e.g.* nodularity and section thickness) and the casting skin features were presented. The experimental results suggest that the Mg depletion because of metal-mould and metal-air interactions was the main reason for the formation of the casting skin.

Keywords: Compacted graphite iron, Ductile Iron, Casting Skin, Formation Mechanism, Casting Surface.

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