

## **Effect of Cooling Rate and of Titanium Additions on the Microstructure of Thin-Walled Compacted Iron Castings**

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This article addresses the effect of cooling rate and of titanium additions on the exhibited microstructure of thin-walled compacted graphite iron (TWCI) castings as determined by changing molding media, section size and Ferro Titanium. Various molding materials were employed (silica sand and insulating sand “LDASC”) to achieve different cooling rates. This study shows that the cooling rates exhibited in the TWCI castings varies widely (70-14°C/s) when the wall thickness is changed from 2 to 5 mm. In turn, this is accompanied by a significant variation in the compacted graphite fraction. The resultant cooling rates were effectively reduced by applying an insulating sand in order to obtain the desired graphite compactness. Ti additions in combination with LDASC sand molds were highly effective in promoting the development of over 80% compacted graphite in castings with wall thicknesses of 2 and 3 mm as evidenced by quantitative metallographic analyses.

**Keywords:** Compacted Graphite Iron, Cooling Rate, Thermal Analysis, Microstructure.

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