

# Effect of Cu, Mn and Sn on pearlite growth kinetics in as-cast ductile irons

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In a previously published work, pearlite growth in cast irons was investigated and it was claimed that growth kinetics of pearlite in nodular cast iron does not depend on alloying elements and that only the start temperature for the transformation is modified. Since then, the authors have investigated the effect of copper at low level of manganese and the combined effect of copper and tin at intermediate manganese contents. In the first case, thermal records confirmed that copper decreases the formation temperature for both ferrite and pearlite. In the second work, an optimised content for tin, manganese and copper was found so as to improve mechanical properties while keeping fully pearlitic structures. The thermal records obtained during this latter study are here used to estimate the pearlite growth kinetics and the effect of copper and tin on it. Tin has been shown to reduce pearlite undercooling (increase of start transformation temperature) and thus to favour the formation of this constituent.

**Keywords:** ductile irons, pearlite growth, copper, manganese, tin, eutectoid transformation