

Pearlitic ductile iron-like sintered Fe-Cr-Mo-Si-C alloys

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Sintered Fe-Cr-Mo-Si-C alloys, produced from two different pre-alloyed powders with compositions of Fe-3.0Cr-0.5Mo and Fe-1.5Cr-0.2Mo, showed a microstructure similar to that of a fully pearlitic ductile cast iron (DCI EN GJS700-2). The two sintered alloys exhibited close values of area fractions of a black particle (7 % of area fraction for the sintered Fe-1.5Cr-0.2Mo-inherited alloy or sintered 1.5Cr alloy and 6 % for the sintered Fe-3.0Cr-0.5Mo-inherited alloy or sintered 3.0Cr alloy) and a pearlitic matrix (93 % for the sintered 1.5Cr alloy and 94 % for the sintered 3.0Cr alloy). The absence of a ferrite shell surrounding a black particle in these alloys was influenced by the alloying chromium. Despite similar microstructural feature, the two sintered alloys showed different tensile properties. With higher alloying element content, the sintered 3.0Cr alloy showed inferior tensile strength and elongation. The reason for lower tensile strength of the sintered 3.0Cr alloy could not be given by microstructural feature differentiation. Further investigation has been being carried out.

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