Influence of Morphology of Carbide Phase in Chromium Cast Iron on Wear Resistance

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The article presents results of M_7C_3 carbides stereological parameters measurement and wear tests of chromium cast irons. There are two types of material were compared: not inoculated chromium cast iron and the same material about 4% addition of titanium by weight. The samples for studies were taken from casting formed by pouring into ATD-Is tester mould. Then they were properly prepared for testing. Stereological analysis was conducted in ImageJ software, where the following parameters of carbides was measured: area, width, length, perimeter, and circularity. Wear test was executed using pin-on-disk method on Tribotester 3-POD. Results of research shown that Ti addition results in formation of TiC carbide, which is an underlay for crystallization of M_7C_3 carbides. The effect of this was the finer grain of M_7C_3 and the lower weight losses during abrasion.

Keywords: Chromium Cast Iron, M_7C_3 Carbide, Stereological Parameters, Wear

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