Modified hydrated sodium silicate as a modern binder for ecological moulding sands

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This article is devoted to ecological moulding sands with hydrated sodium silicate as binder. The inorganic nature of the binder results in poor knock-out properties and low ability to mechanical reclamation of tested moulding sands. In the present study authors focused on developing a new addition to the composition of these environmental friendly foundry moulding sands, providing them better knock-out properties. The analysis of the literature data let authors focus on the use of additives containing Al_2O_3 as components of moulding sands with hydrated sodium silicate. These additives provide better knock-out properties of moulding sands measured according to retained strength R_c^{tk} and also lead to lower thermal expansion of moulding sands. The authors have developed a new supplement containing Al_2O_3 and demonstrated its positive impact on moulding sand with hydrated sodium silicate knock-out properties.

Keywords: moulding sand, hydrated sodium silicate, phase gamma Al_2O_3 (γ-Al_2O_3 phase), thermal expansion, knock-out properties

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