Effect of Pre-Wetting of High-Silica Sand on Parameters of Dried Moulding Sands Bonded with Selected Grades of Water-Glass

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Within the research, an attempt was made to determine influence of preliminary wetting of high-silica based eco-friendly moulding sands containing sodium water-glass on effectiveness of their hardening by traditional drying. Effectiveness of adding water to the base during stirring was evaluated by comparing mechanical and technological parameters after traditional drying at 100 °C. Medium high-silica sand and two grades of hydrated sodium silicate 149 and 150 were used in the examinations. It was found that modification of preparation procedure by adding a proper quantity of water to high-silica base before adding binder (1.5 wt%) favourably affects mechanical and technological parameters of hardened sandmix. Results of the measurements are correlated with SEM observations of links between base grains. On the grounds of complex evaluation of moulding sands hardened by traditional drying, a positive effect of water addition was found, especially in the sandmixes containing binder with higher viscosity, i.e. grade 149. Optimum quantity of water addition should be determined for each specific grade of binder.

Keywords: foundry sands, drying technology, water-glass, wetting, strength

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