STUDY OF THE INFLUENCE OF LIQUID HARDENERS ON THE PROPERTIES OF COLD-HARDENING MIXTURES

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One of the disadvantages of the CHM based on liquid glass (LG), which usually contain 6 ... 7% LG, is the formation of low-melting silicates at temperatures above 700°C which leads to sintering of the mixtures during subsequent cooling of the casting and, consequently, to an increase in the residual strength of the forms and cores, and a deterioration in their knockout. Due to the strong adhesion of liquid glass films to the surface of sand grains, the regeneration of these mixtures is also difficult [1].

Therefore, the development of new liquid hardeners for CHM which would improve the knockout of forms and cores, make it possible to abandon the CO_2 process and thereby simplify the technological process, is a pressing task for foundry production.

The aim of the research is to establish the possibility of using binders based on liquid glass with the use of cyclocarbonates (CC) based on raw materials of plant origin in foundry production [2].

For this purpose, experiments were conducted to determine the main properties of the mixture, such as compressive strength, durability, crumbling, and knockout.

As a hardener for cold-hardening mixtures on liquid glass, CC based on raw materials of plant origin was used. The amount of hardener varied in the range from 0.35 to 3% of the sand mass [3].

As a result of the experiments it was established that:

1) CC can be used as a hardener for liquid glass mixtures;

2) A hardener based on plant-based raw materials is an environmentally safe material, because when pouring metal into a mold, it decomposes and releases water vapor and CO_2 into the environment as a result of thermochemical destruction.

3) The optimal amount of CC in the mixture is 0.4% of the sand mass. With this amount, the best strength and chewability indicators are achieved. At the same time, the crumbling of the mixture is reduced by 1.5 times, and the knockout is improved by 2.5 times.

Reference:

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