

SELECTION OF CHEMICALLY CURED MOLDING SANDS' WITH INORGANIC BINDERS DEDICATED TO 3D SAND PRINTING

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Abstrakt

Due to the high technological potential, also in thin-walled casting, 3D printing technologies in the foundry industry are developing very dynamically. Binder jetting technology is most commonly used for the production of sand molds and cores with 3D printing. The binding materials used in foundry practice are organic resins modified with furfuryl alcohol. These materials are characterized by excellent technological properties, but at the same time they are harmful to the environment. Environmentally friendly inorganic binders are an alternative to the organic binders used for the production of molds and cores, and this is the subject of research carried out at various research centers.

This work determines the influence of molding sands' with different inorganic binders composition on their chosen properties. The molding sands with 3 commercial inorganic binders used in traditional mold and core production technologies were tested as well as the molding sands dedicated to 3D printing with new binders based on them. Four types of hardener were used for chemical curing.

The molding sands' technological (strength properties, permeability, abrasion) and thermophysical (thermal deformation) tests and the physicochemical tests of binders (viscosity, wettability of the quartz substrate) have shown that inorganic binders elaborated on the basis of commercial binders can be used in 3D printing technology. The selected sands' compositions were chosen for further research.

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