

MATERIALS RECYCLING IN THE PRODUCTION OF POROUS POLYMERIC MOLDS

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A method of pressure slip casting into porous polymer molds is widely used in the production of sanitary ceramics. These molds are most often made of reactive casting materials, which consist of a mixture of polymer powders with a mean particle size of 20 - 500 μm , a mixture of reactive vinyl monomers, radical polymerization initiator, water and suitable emulsifiers and agents that stabilize the heterogeneous casting compound. Casting compounds with a pore radius typically in the range of 10 - 25 μm are available commercially having good physical and mechanical properties, enabling tens of thousands ceramic castings to be produced without problems at pressures up to 1.5 MPa.

During the production of porous molds for die casting of sanitary ceramics, wastes of hardened polymer mass are generated. Their sources are mainly residues from the cleaning of production equipment, from the mechanical processing of the hardened mold and sometimes the whole produced non-functional mold. However, the largest source of material waste is end-of-life porous molds. At least partial recycling of these wastes in the production of new molds would help to reduce material costs and the environmental impact of the production itself.

This contribution will present some results from testing the possibilities of using waste from the production of porous polymer molds as solid recycle in the production of new molds. Attention will be paid to the influence of the particle size of recycled powders, their content in the recipe of the new polymer mass and the influence of some other recipe parameters on the properties of polymer porous materials. Achieving suitable flow properties is crucial for the successful application of polymeric molding compound containing recycle on a technical scale.