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REDUCTION OF THE USE OF SOLVENT IN THE CASTING INDUSTRY: USE OF POLYURETHANE BINDER IN FOUNDRY SYSTEM OF LOW TOXICITY

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Today the production of cast (metals) in Brazil is approximately 3 million tons, with emphasis on the production of cast iron that is responsible by 90% from total. This segment of the economy brazilian employs nearly 50000 workers, invoicing \$ 3 billion per year, contributing positively in the country's trade balance. One of the factors that need to be improved in the national industry is the productivity, increasing the amount of castings produced by plants installed in the country. The search for new technologies applied to the processing of the castings is one of the ways to achieve higher speeds of production, such as the development of new methods of molding, which the phenolic urethane no-bake systems has been increasing in recent years by significantly increase productivity in foundries. But the growing use of these materials involve the increased emissions of volatiles into the job environment and increases the potential risk to health by pollution to the environment due to the presence of toxic compounds in sands discarded. The possibility of changing these binders (phenol, formaldehyde and a large amount of aromatic compounds as solvents) for alternative binders with low toxicity, but maintaining the structure of a polyurethane will be the main focus of this work. The study of these materials and their properties such as binding agents were evaluated through the preparation of samples of silica sand agglomerated with the binder system. Several formulations and ratios of NCO:OH were studied. The mechanical properties of specimens test were evaluated by testing the tensile strength in a normal environment with high humidity and at intervals of 30 minutes, 3hours and 24 hours. Thermal properties were evaluated by TGA measurements and mechanical strength after the specimens exposed to high temperatures. In the complete work with all properties evaluated.