Alternative Construction 3D Printing Materials

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The goal of this project was to expand the usefulness of construction 3D printing through exploring and testing alternative materials. By expanding upon construction 3D printing, this project aimed to improve construction by providing an easier, cheaper, faster, and more environmentally friendly alternative to traditional construction methods. This project will demonstrate how various material mixes can be printed and will compare characteristics such as printability, density, weight, and compressive strength. These preliminary comparisons will help determine if the alternative material mixes could be used in construction 3D printing and are viable for further testing on a large professional scale. In order to do this, a model printer was used to replicate the process of construction 3D printing using PVC pipe. Various materials such as paper, magazines, Styrofoam, rubber, and sawdust were added to a cement/sand mixture and mixed, then printed. The samples were tested for printability, density, weight, slump, and spring constant. The sawdust, paper, and magazines had the best printability, while the rubber and Styrofoam did not print smoothly. Based on the data and observations, some of the mixes are viable for further testing on a professional scale.

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