

Abstract

Mixing the main materials constituting processed wood-plastics is a pivotal step in producing this product which impose substantial effect on its fundamental features. In this research, effect of mixing method of base materials with filler ones also the sensitivity of polymer type, considering mixing methods on physic-mechanical characteristics of wood-plastics structures was investigated. Samples of Pine wood flour as filler with three types of heavy polyethylene, light polyethylene and polypropylene as polymer matrix with known ratio weights in two independent methods produced. In the first method, ingredients are produced in melted mix using Extruder device. In second method, samples were provided using plain-press procedure. The way of making and type of polymer were variable of this research. analysis of the data gathered from physic-mechanical tests (tensile and flexural strength, water uptake and thickness swelling) was done in accordance with ASTM standard. In general, in comparing two methods of multi-structures, Extruder method in mechanical characteristics shown better performance than plain-press. Also in investigating the physical characteristics, method of Extruder in water uptake and thickness swelling was better than plain-press. But in comparing polymers, highest resistant was observed in heavy polyethylene and the most flexural strength was seen in poly propylene. The least amount of water uptake was seen in light and heavy polyethylene. It seems that small polyethylene molecules with respect to propylene prohibit water to get into multi- structure wood-plastics. Also, polypropylene shown the least amount of thickness swelling which could be related to high amount of Crystallites of molecules in these polymers.

Key words: Extrusion, Powder Mixing Drum Blender, Wood-Plastic , Internal mixing, Physical and Mechanical Properties



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**A comparison of two mixing techniques: Internal mixer,
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