

Improving Rotary Drum Blending Process through Experimental Investigation and Discrete Element Method Simulation

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Understanding strand motion inside a Rotary Drum Blender (RDB) is key to improving the blending efficiency of Oriented Strand Board (OSB) manufacturing. A common problem, surging, occurs when strands pile-up on top of the atomizer boom and therefore have very limited exposure to resin. The relationship between strand motion and the current operating parameters used in mills is not clear and value for such parameters are usually chosen based empirically due to the difficulty of observing strands in a sealed blender drum. In order to be able to visualize the strand motion, a simulation model of the RDB process is needed in which the strand motion and position of those strands over time can be tracked. Such information will permit the identification of values that maximize the exposure of each strand to the resin spray.

We will report on a comprehensive examination of the effect of various operating parameters on strand motion inside a RDB; i.e., strand bulk density, strand breakage, coefficient of static and rolling friction. We will also present a Discrete Element Method (DEM) in which these values have been incorporated and compare model predictions with observations. We will also present results on how surging affects IB strength.