

An Improvement of Mixing Efficiency for Biomixer System Using Analysis of Particle-Structure Interaction Model

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The biomixer system has been developed for mixing, drying, pulverizing and fermentation with specialized mixing chamber structures. In general, the structure of the biomixer should be designed for recycle performance of organic waste materials such as livestock excretions, waste water treatment sludge and food waste. But it is not easy to design because that the rotating parts of the main shaft, paddles and support ribs have complex geometries and they rotates against to raw materials with various materials properties. In this paper, we have generated analysis models of the biomixer system with particles-structure interaction under various design parameters like the angle, position and rotating speed of paddles. The particles in this analysis model represents the organic waste materials and we calculated the interaction of particles and structures during various operating conditions to find out best design condition. And from these results, we suggest a design method to improve mixing efficiency of waste materials with the best durability performance of structures.