Novel device to improve powder flow

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A new device created at Purdue University is designed to protect the integrity of drug and food products, while improving the consistency in flow. Credit: Purdue University

Anyone who has tried to pour powdered sugar into a jar knows that sometimes beating the sides of the container or package is the only way to make it flow. That same process is used in making medicines and

products such as powdered milk, where workers routinely hammer on the sides of large bins to unstick the powdery mixture.

Purdue University researchers have developed technology to help improve the process and reduce the need for the hammering in production. The team created a flow aid that can be placed inside a bin and controlled with Bluetooth.

"This device directly transfers vibration energy to the powders without affecting the structural integrity of the bin," said Kingsly Ambrose, an associate professor of agricultural and biological engineering, who leads the team with Karthik Salish, an engineering graduate research assistant. "This device could also monitor powder parameters like temperature, humidity and pressure, which in turn indicate any change in quality."

Erratic flow in the powder mixture is a common problem in the manufacturing industry. Some of the powder can stick to the sides of the bin or clog in the middle of it, resulting in deficiencies in the powder and final product.

"There are flow aids that can be used outside the bin," Ambrose said. "These aids present numerous problems in reliability, are typically very expensive and require additional support such as compressors."

Ambrose said the device developed at Purdue also allows the user to control the vibration intensity and location to provide a consistent powder product. He said the device also has applications for the agricultural and grain industries.

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Provided by Purdue University