

**13004032 A Mathematical Model for Continuous Drying of Grains in a Spouted Bed Dryer**

Drying Technology Vol.20 No.3 JAN/2002 pp28 THA

*Thanid Madhiyanon, Somchart Soponronnarit\*, and Warunee Tia*

School of Energy and Materials, King Mongkut's University of Technology Thonburi, Suksawat 48 Road, Bangkok 10140, THAILAND

A mathematical model for a continuous spouted bed dryer has been presented to predict moisture content, air and grain temperatures as well as energy consumption. To better understand the interactive influence of processes in each region of the spouted bed, solution schemes for the spout and downcomer were treated separately. The behavior of dryer was investigated experimentally and found that the dryer behaved differently from an ideal plug flow. The drying rate as simulated by the model is almost constant during grain movement in the dryer. Absence of airflow in the downcomer leads to a tempering process that takes place in the downcomer while intense heat and mass transfer occurs mainly in the spout due to the high airflow rate there. Furthermore, by considering the predicted grain temperature history as one of the indicators of product quality, one can, in principle, design appropriate successive processes in a continuous spouted bed dryer to minimize product damage.