

Title Automatic Endpoint Determination for Batch Tea Dryers  
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### **Abstract**

A laboratory batch fluid-bed dryer was developed for handling small samples of tea for experimental batch manufacture, and this dryer required a means of stopping drying when the process was complete. A control system was devised which requires only the initial weight of the sample to be entered into the controller. The system then takes full control, using only an inlet and exhaust temperature measurement. A simulation model was used to explore the operating region of the dryer, and how the various disturbances affected the drying time. A relationship was found between time to a transition temperature and time to completion which enabled a simple algorithm to be developed, suitable for implementation on a microcontroller. The method was found to be substantially independent of variables such as sample moisture content and ambient air conditions, as well as inlet temperature, over the range normally experienced. The algorithm was tested in practice and found to give adequate control, substantially better than the manual system used previously.