THE UNIVERSITY OF MANCHESTER INTELLECTUAL PROPERTY
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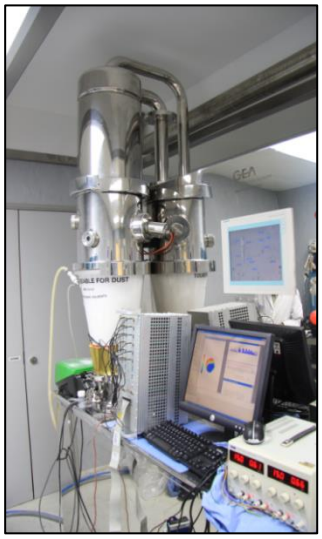
MOISTURE MEASUREMENT AND CONTROL IN FLUIDISED BED DRYERS

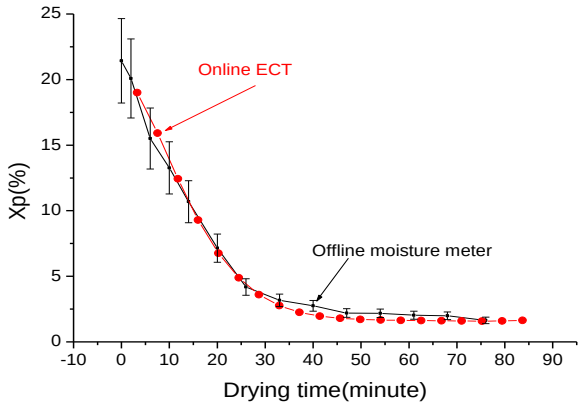
BACKGROUND

Fluidized (fluid) bed drying continues to be a major element of processing in the pharmaceutical industry. Achieving optimum and uniform moisture levels is critical to the quality of granules and the subsequent final tablet formation. Currently, fluidized bed dryers are operated by trial and error because of the lack of online tools for moisture distribution measurement. In the absence of real-time monitoring of moisture within fluid bed processors, alternative management strategies have to be used, which lead to more energy being utilised than is necessary, and fluctuations in product quality. Solutions are required to provide online monitoring during the drying process, and to provide the facility to control moisture content in a responsive manner for more efficient operation of drying processes.

THE TECHNOLOGY

A University of Manchester research group has developed a tool to allow the online measurement and consequently control of moisture in a fluidized bed dryer. The system uses Electrical Capacitance Tomography (ECT) to image gas-solids distribution and to provide online moisture measurement. Extensive work has also been carried out to develop an online distributed control system based on the measurements from such an ECT sensor, by dividing the air distributor into different sections and controlling each section. A feedback loop is set up to process parameters against real-time control, along with accompanying software. The system provides the potential for a fully integrated solution or to be retro-fitted to existing fluidized beds for diagnosis purposes. The technology has been demonstrated on semi-scale and production-scale fluidized beds.





Online moisture measurement by ECT against moisture meter

KEY BENEFITS

- Online moisture measurement
- Online control of temperature and air flow rate based on online measurement
- Uniform gas-solids distribution in fluidized bed dryer
- Distributed control
- Enhanced operation efficiency by reducing the drying time
- Reduced energy consumption
- Guaranteed uniform quality of products
- Accompanying software package.

APPLICATIONS

The technology is applicable to batch processing in the pharmaceutical industry, and also to other industries (e.g. food, marine, agro-chemical and power) where moisture content must be monitored and controlled.

INTELLECTUAL PROPERTY

We have a granted patent in the US, Patent No. 8,461,852.

OPPORTUNITY

The technology is available for collaborative development with option to license.

CONTACT

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