

IN APPLICATION

Online Particle Monitoring in Spray Drying Process

Ceramic Powder Production at Japan Fine Ceramic Center (JFCC), Nagoya, Aichi, Japan

Introduction

Spray drying is a commonly used powder production process utilized in many industries. From pharmaceuticals, food products to ceramic powders or any other application where small homogenous particle size distributions are required.

Whether for optimizing the spray drying process itself or for quality control, the particle characteristics and size distribution of the end product need to be known. There are numerous analysis methods for manual offline measurement of the particle size distribution. Offline measurements are time consuming and costly. With a fast and reliable imaging system and Digital Image Analysis (DIA) it is possible to have online monitoring of particle size distribution. This gives instant feedback on product quality and changes in the production parameters.

LaVision's **ParticleMaster inspex** system was used at the Japan Fine Ceramics Center (JFCC) to monitor the particle size distributions during the production of ceramic powder on a commercial spray dryer (figure 1).



Figure 1: Spray dryer at JFCC, Nagoya (Japan).

JFCC is the unique public non-profit organization in Japan involved in the research, testing and evaluation of fine ceramics, contributing to a wide range of industries.



ParticleMaster inspex System

The product was monitored at the exit of the spray dryer during production. The **ParticleMaster inspexonline** system was mounted at the spray dryer exit (figure 2). The product was fed to the sensor sight glass by an ultrasonic feed on its way to the collection container.

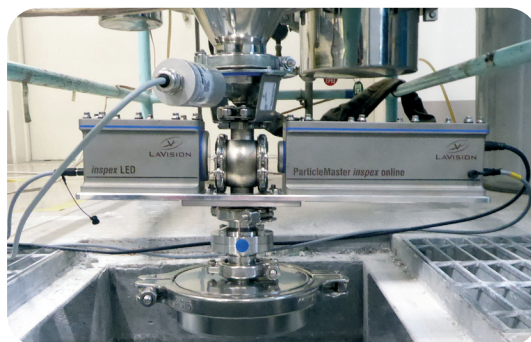


Figure 2: ParticleMaster inspex installed inline with the product collection of the spray dryer.

Online Particle Monitoring

The **ParticleMaster inspex** system provides real time measurements of characteristic statistical size data and particle size distribution (figure 3). In addition, the software can also analyze the shape and velocity of individual particles. This imaging technique gives direct visualization of the detected particles making it more than a black box sensor (figure 3).

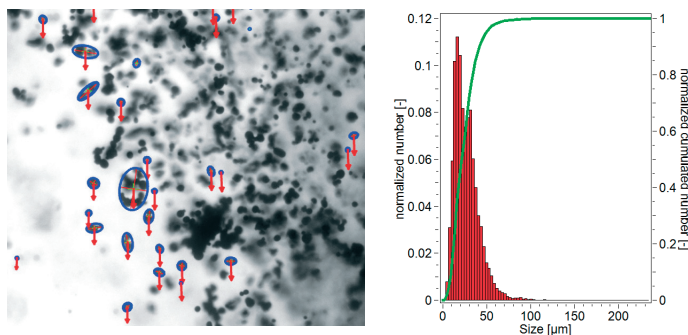


Figure 3: Particle image with digital image analysis overlay information (left) and real time size distribution diagram from ceramic powder production process.

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