

Fuji Spray Drying Newsletter

Vol. 9: Spray Dried Solid Dispersion Development :Spray Drying System Selection

In addition to the operation parameter, selection of the spraying system has significant effect on the quality of the spray dried materials (particle size/shapes, etc.). There are 3 main spraying systems: two fluid nozzle, pressure nozzle, and rotary atomizer. Characteristics of each of the 3 spraying drying systems are described below.

1 Two Fluid Nozzle

Two fluid nozzle allows two fluids, feed solution and nitrogen gas, to flow from the nozzle tip. Feed solution is converted to fine droplets by the sprayed nitrogen gas. Particle size can be controlled by the nitrogen gas flow rate. It is characterized by its capability to achieve relatively small particle size. However, it has the tendency to have wider particle size distribution in comparison to other spraying system.



2 Pressure Nozzle

In contrast with the two fluid nozzle, pressure nozzle allows only the feed solution to flow from the nozzle. There are two types of components for the nozzle tip: core and orifice. By varying the combinations of these components, particle size and spray angle can be controlled. It is characterized by having the capability to achieve larger particle in comparison with other spraying system. However, the spray dryer has to be stopped to change the core/orifice combination during an optimization study unlike other spraying systems.

3 Rotary Atomizer

A disk with slits is rotated at high speed to atomize the feed solution. Particle size can be controlled by rotational frequency of the disk, and more uniform particle size can be achieved in comparison to other spraying system. However, since the risk of heavy metal contamination may be a concern (due to high speed rotation of the disk,) it is often not favored in pharmaceutical applications.



In this issue of our technical newsletter, we have shown you an outline of our technical service.
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