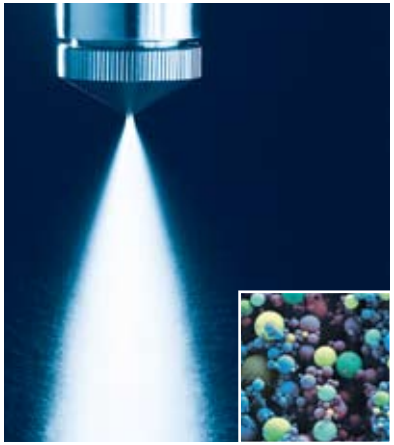
Process parameters

Parameter / Dependance	Aspirator ↑	Humidity drying gas ↑	Inlet temperture ↑	Spray gas flow ↑	Feed rate ↑	Solid concentration ↑	Organic solvent instead of water ↑
Outlet temperature	↑	↑	↑	↓	↓	↑	↑
Particle size	—	—	—	↓	↑	↑	↓
Humidity in final product	↓	↑	↓	—	↑	↓	↓
Yield	↑	↓	↑	—	↓ ↑	↑	↑



Legend:		
	High influence	Increasing parameter
	Moderate influence	Increasing variable
	Minor influence	Decreasing variable
	No influence	

Parameter explanations

The influence of the different process parameters on the dependent variables are as follows:

A higher aspirator rate ...
- offers more drying energy and increases the outlet gas temperature.
- offers more drying energy and results a smaller amount of residual moisture in the product.
- results a higher degree of separation in the cyclone.

A higher drying gas humidity...
- means less vapour uptake capability in the gas stream. Saturation occurs easily leading to a higher outlet temperature.
- might increase the humidity of the final product.
- might result in moist particles, which could adhere to the glassware thereby decreasing the yield.

A higher inlet temperature ...
- increases the outlet temperature proportionally.
- reduces the relative humidity in the drying gas and the powder gets dryer.
- offers a dryer product, which is less sticky and increases the yield.

A higher spray gas flow...
- decreases the outlet temperature due to additional cold gas to heat up.
- produces smaller droplets from the nozzle and the corresponding solid particle size decreases.

A higher feed rate...
- means more liquid to evaporate and decreases the outlet temperature.
- increases the droplet size because more liquid has to be dispersed.
- increases the moisture content in the gas and might result in humid or moist products.

A higher solid concentration....
- means less liquid to vaporize and increases the outlet temperature.
- results in more solids in a drop and increases the particle size.
- produces bigger particles, which are easier to separate and the yield increases.
- decreases the partial pressure of solvent in the gas and the final product humidity decreases.

Organic solvent instead of water...
- offers a liquid that uses less energy to vaporize and the outlet temperature increases.
- results smaller particles due to the lower surface tension.

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