

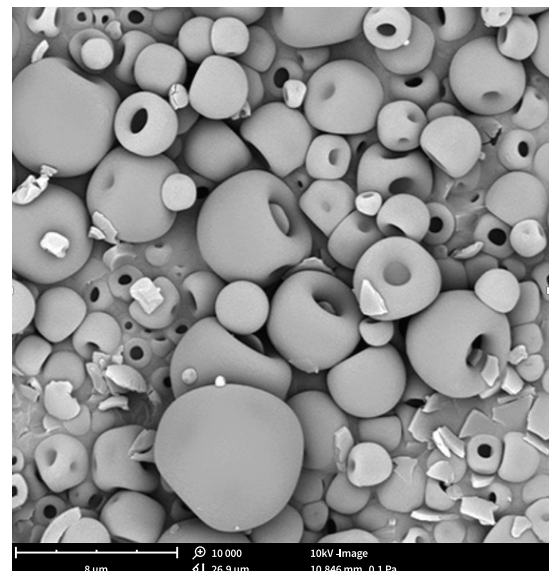
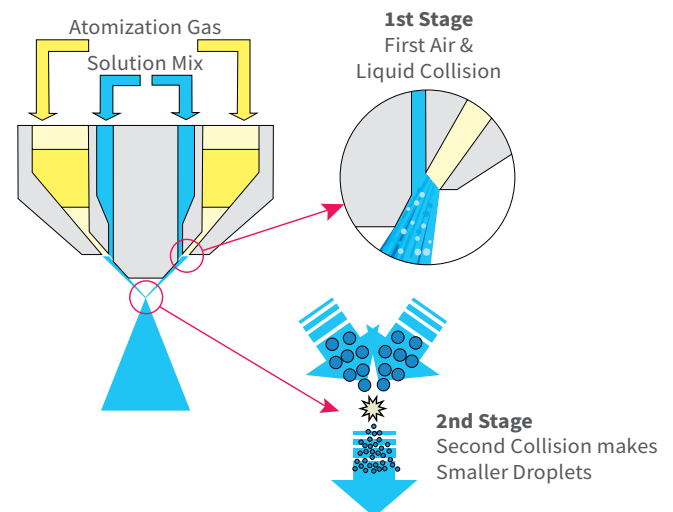
Producing Particles Smaller than 10 μm using the Twin Jet Spray Gun on the VSD-200 Spray Dryer

The Process...

Conventionally, the only way to produce fine particles of 10 μm or smaller was to either suppress throughput or lower solid content concentration. The twin jet nozzle was developed to enable the mass production of fine particles without applying such restrictions.

The following evaluation was performed to determine if the Freund-Vector VSD-200 can be used to manufacture spray dried powders having the appropriate particle size, size distribution and morphology to be used in a customer formulation.

Parameters	Trial 1	Trial 2	Trial 3	Trial 4
Solution	Proprietary Info			
Aqueous Solution Loaded (g)	250	250	250	250
Spray Pressure (PSI)	17	30	17	30
Gun Pressure (PSI)	11	20	11	20
Inlet Air Temp ($^{\circ}\text{C}$)	70 $^{\circ}$	70 $^{\circ}$	90 $^{\circ}$	90 $^{\circ}$
Pump (rpm)	19	19	19	19
Solution Spray Rate (g/min)	~3	~3	~3	~3
Atomization Air Flow (l/min)	29	35	29	35
Spray Time (min)	80	81	86	84
D10 μm	0.19	1.29	0.18	0.15
D50 μm	2.98	2.98	3.17	2.10
D90 μm	6.81	6.79	6.53	4.53
Total Yield (%)	81	61	81	64



The Conclusion...

The results concluded that the VSD-200, equipped with a Twin Jet Spray Gun, is capable of spray drying particles with sufficiently spherical morphology and the desired size of 3 microns. The yields recovered surpassed customer expectations. Additional testing can be done to dial in the parameters resulting in a higher yield.