



Third Party Droplet Size Study with e3's New Generation Motor & Hub

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Atomizer Set UP

- Laboratory test indoors
- Laser positions at 12 inches from the atomizer
- 20 test setting combinations

Instrumentation

- Sympatec HELOS KR Laser Diffraction Particle Analyzer
- Testing was performed using an R6 lens setup. This lens configuration allows a measurement range of 0.5 μm to 1,750 μm .
- MicroMotion Coriolis-style flow meter

Laser Setup

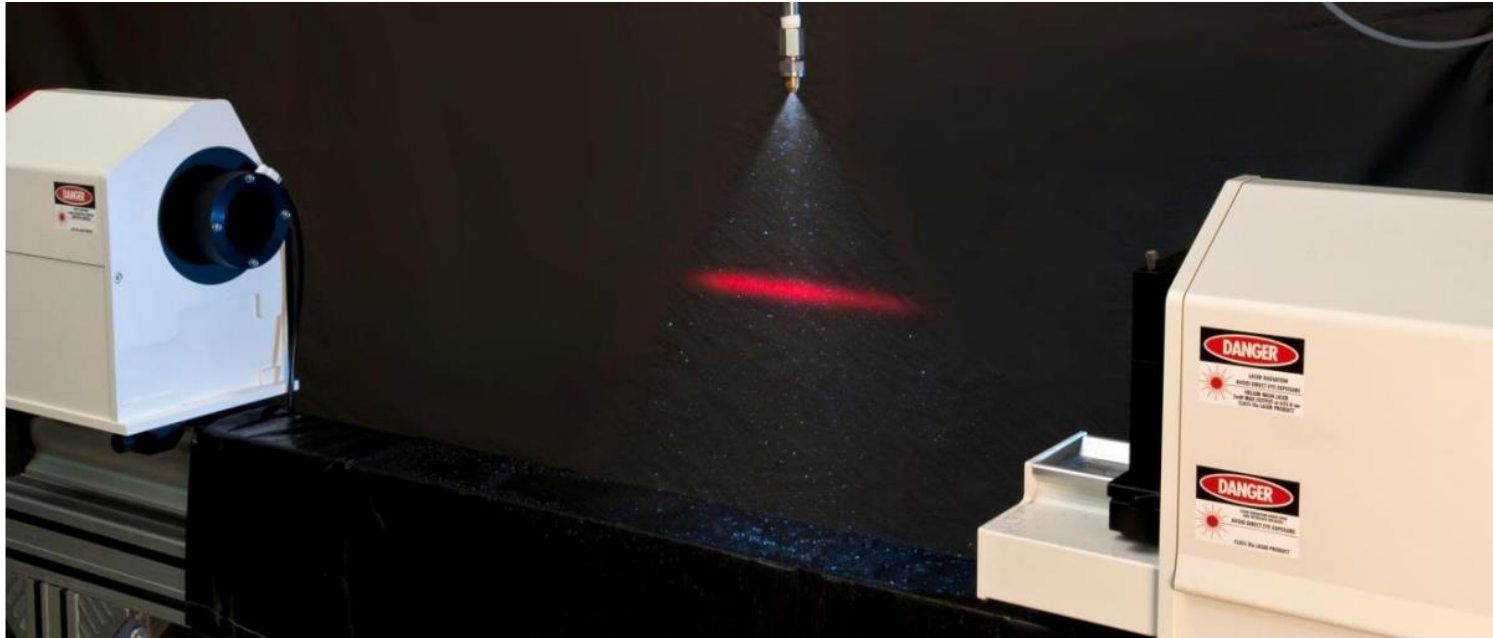
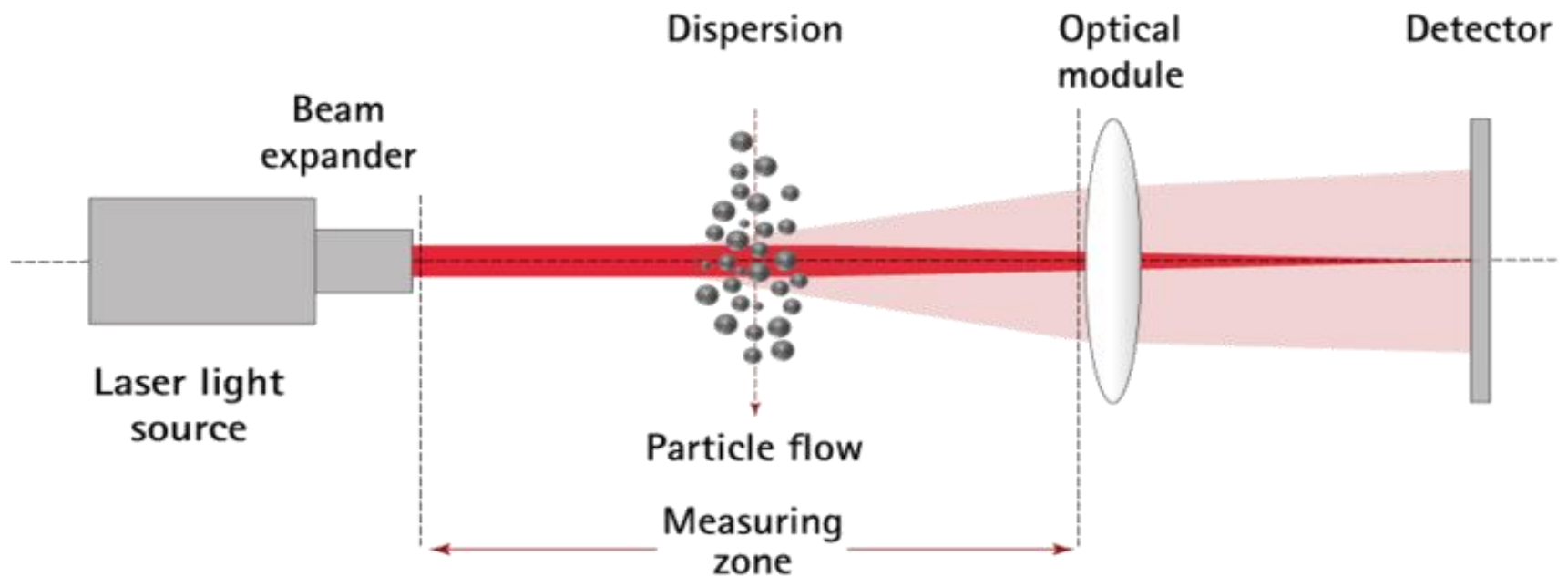


Figure 3: The Sympatec HELOS KR Laser Diffraction Particle Analyzer. (www.sympatec.com)



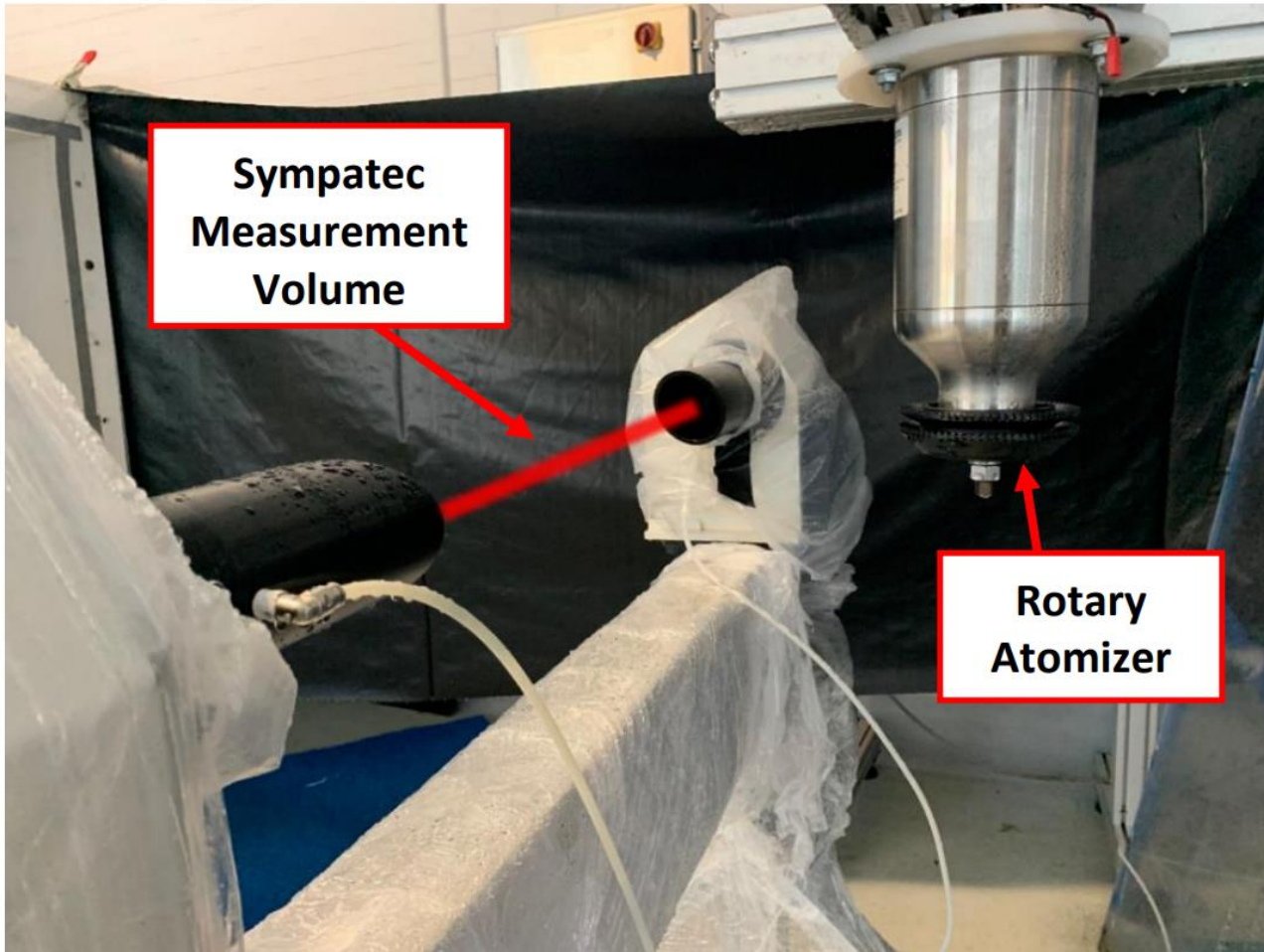


Figure 1: Position of Sympatec and rotary atomizer.

Test Results and Settings

Table 1: Summary of drop size results for each trial.

Test #	Flow Rate (gpm)	VFD Freq. (Hz)	Approx. Speed (rpm)	D _{V0.1} (μm)	D _{V0.5} (μm)	D _{V0.9} (μm)
1	5	90	5,400	51.8	132.4	277.9
2	5	110	6,600	35.1	107.4	222.3
3	6	120	7,200	28.9	98.8	193.7
4	6	130	7,800	23.3	87.1	206.3
5	7	140	8,400	22.2	90.7	201.8
6	7	150	9,000	17.9	80.1	192.2
7	8	90	5,400	47.8	153.4	365.2
8	8	110	6,600	37.9	124.7	249.4
9	8	130	7,800	30.9	109.7	209.9
10	8	140	8,400	32.9	103.0	212.9
11	8	150	9,000	31.6	91.1	181.6
12	8	167	10,000	29.3	85.2	175.1
13	9	167	10,000	29.2	85.1	179.4
14	9	130	7,800	42.3	115.4	225.3
15	9	90	5,400	66.6	170.1	418.6
16	10	90	5,400	71.3	191.8	476.8
17	10	110	6,600	56.0	160.1	413.2
18	10	135	8,100	39.4	128.7	302.6
19	10	150	9,000	34.0	109.4	235.0
20	10	167	10,000	30.1	98.4	209.6

Results

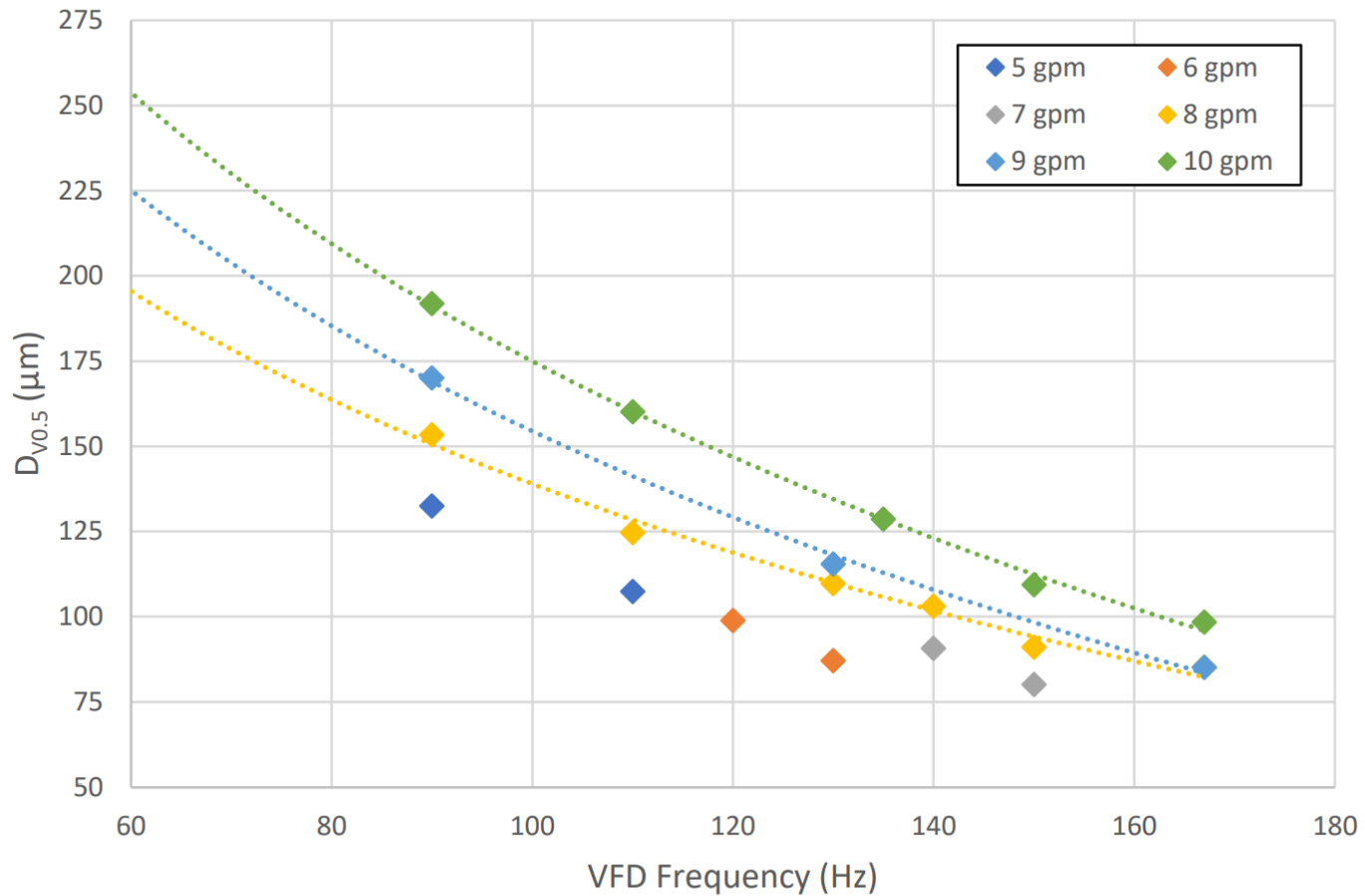


Figure 5: $D_{v0.5}$ vs VFD Frequency for all trials.



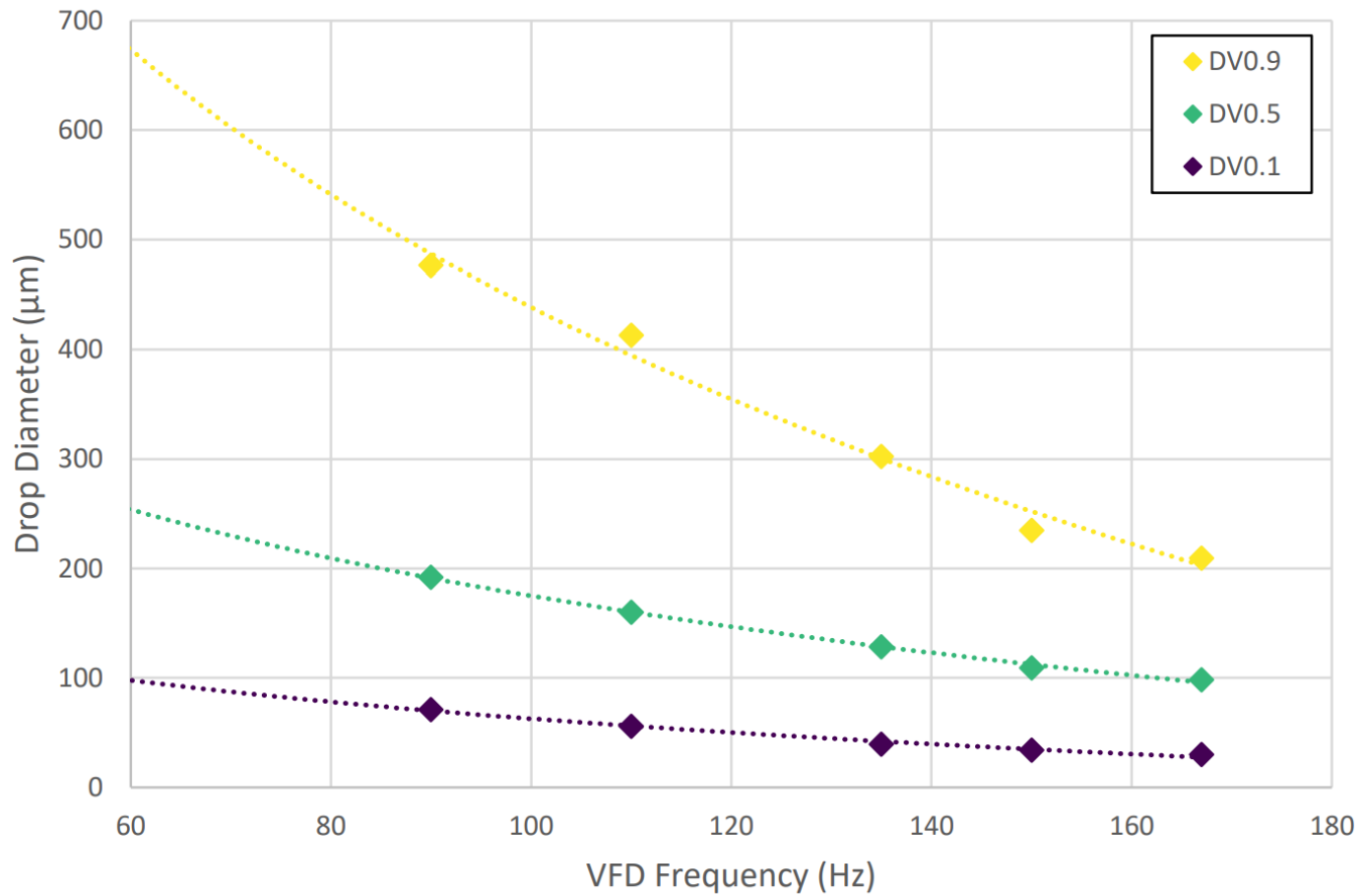


Figure 6: Drop size statistics vs VFD frequency for all trials performed with a flow rate of 10 gpm.

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