Nicomp® Online Nanoparticle Size Analyzer

Now measure nanoparticles 1 nm – 1 µm continuously with the Nicomp Online system

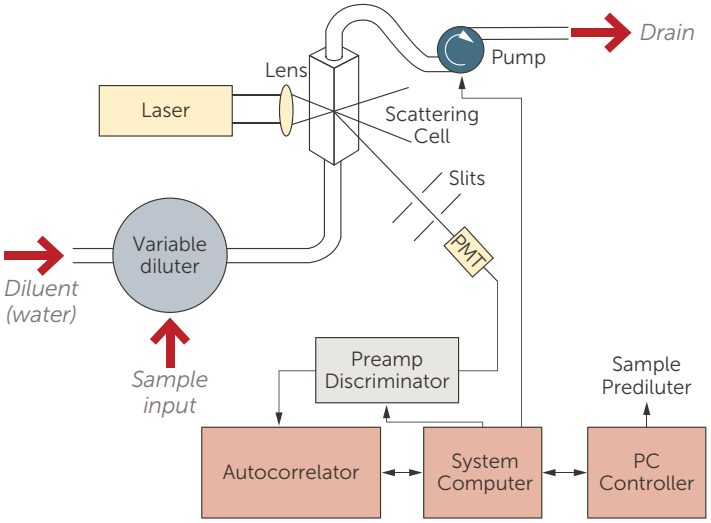

Figure 1. Optics/fluidics schematic

Dynamic light scattering (DLS) is the most prevalent size analysis technique for nanoparticles. Although the vast majority of DLS size measurements are performed in the laboratory, Entegris has been supplying online DLS system solutions for over 25 years.[1,2] The nanotechnology revolution has created higher demand for online DLS systems and the Nicomp® Online is a proven industrial solution.

Operation: The Nicomp Online schematic is shown in Figure 1. The pressurized sample line enters a variable diluter where the diluent automatically adjusts the concentration to the optimum range for the measurement. The diluted sample enters the scattering cell where the DLS measurement is performed. Once the measurement is completed, the sample is pumped to drain, the system is cleaned and another measurement is initiated.

Process integration is easy: The optics units measure 10"x12"x6" as shown in Figure 2. The sample and diluent enter the system via 0.25" tubing. The inlet sample pressure can be 10 – 1500 psi. An electronics control box (not shown) connects to the optics/fluidics enclosures seen in Figure 2 and can be located 1 – 5 m from the optics/fluidics. A standard process environmentally hardened computer controls the Nicomp Online system.

Figure 2. Optics/fluidics module

Results: Figure 3. Shows data collected at a customer site[3] with mean particle size on the left y-axis and homogenizer pressure on the right y-axis. Results were generated ~ every 3 minutes, provided the ability to optimize operating conditions to achieve the desired size result.

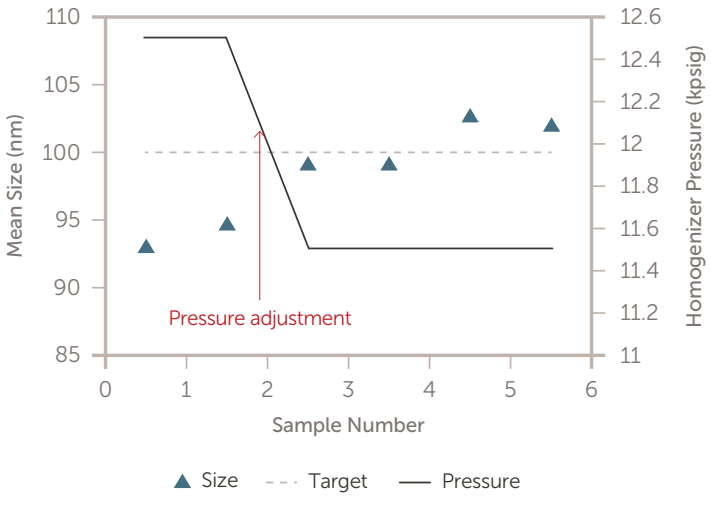

Figure 3. Size vs. pressure results

SPECIFICATIONS*

Principle	Dynamic light scattering (DLS), 90° data collection angle
Size range	1 nm – 1 µm, depending on sample density
Analysis algorithms	Gaussian and Nicomp high resolution multi-modal with ability to resolve peaks separated by 1.5X in size (220 and 340 nm)
Detectors	PMT standard, optional 7X gain APD
Light adjustment	Light intensity automatically controlled using a neutral density filter
Temperature range	10° – 50°C
Physical	Electronics enclosure: 10"w x 12"h x 6"d Fluidics/optics enclosure: 10"w x 12"h x 6"d
Power	100 – 120 VAC, 60 Hz or 220 – 240 VAC, 50 Hz

** The Nicomp Online system includes three components: the optics/fluidics enclosure, the electronics enclosure and a computer. The specifications presented in this flyer are typical, but custom systems built for specific processes and requirements are possible.*

References

[1] Kourti, T., et. al., Online Particle Size Determination during Latex Production using Dynamic Light Scattering, American Chemical Society, 1991

[2] Nicoli, D., et. al., Online submicron particle sizing : Carrying the analytical laboratory to the process facility, American Laboratory, October, 1990

[3] Data courtesy of Bind Therapeutics, Cambridge, MA

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