Conference abstract LPAT01

Real Time Measurement of Particle Size as a Response to the FDA's PAT Regulatory Framework

B. LOOSER 1, A. VAISMAN 2, A. BLASCO 3

1 Malvern Instruments, Malvern, United Kingdom
2 Malvern Instruments, Westborough, MA, USA
3 Malvern Instruments, Orsay, France

E-mail: Bernd.Looser@malvern.com (B. Looser), Alon.Vaisman@malvern.com (A. Vaisman), Alain.Blasco@malvern.com (A. Blasco)


The availability and use of appropriate Process Analytical Technology (PAT) is fundamental to achieving the transformed style of pharmaceutical manufacture that is envisaged by the regulators. Implementing the knowledge-driven, risk-based approach to development and manufacture described in ICH Q8, Q9 and Q10 Guides, and adopting more efficient, modern operating practices, depends on being able to reliably identify, analyze and control those parameters that dictate pharmaceutical performance. This paper examines the potential contribution of laser diffraction particle sizing technology within this context, focusing on the use of industrially proven on-line solutions for real-time measurement and automated process control.

Particle size has a controlling effect on the behaviour of many pharmaceutical products, often influencing critical to quality parameters such as dissolution rate, bioavailability and product stability. Where this is the case, the robust and proven technique of particle sizing by laser diffraction has for many become the method of choice. Non-destructive, with measurement rates sufficiently rapid for real-time monitoring, laser diffraction transitions easily, from the laboratory through to on-line measurement within the pilot plant, or in a manufacturing environment. With on-line analysis in place, the design, optimization and control of unit operations such as granulation, spray drying and, perhaps most importantly, milling becomes simpler and much more effective. Case studies illustrate this, the most compelling describing the use of on-line laser diffraction technology to fully automate control of a mill such that the particle size of the exiting active is maintained within specification despite variations in feed quality.