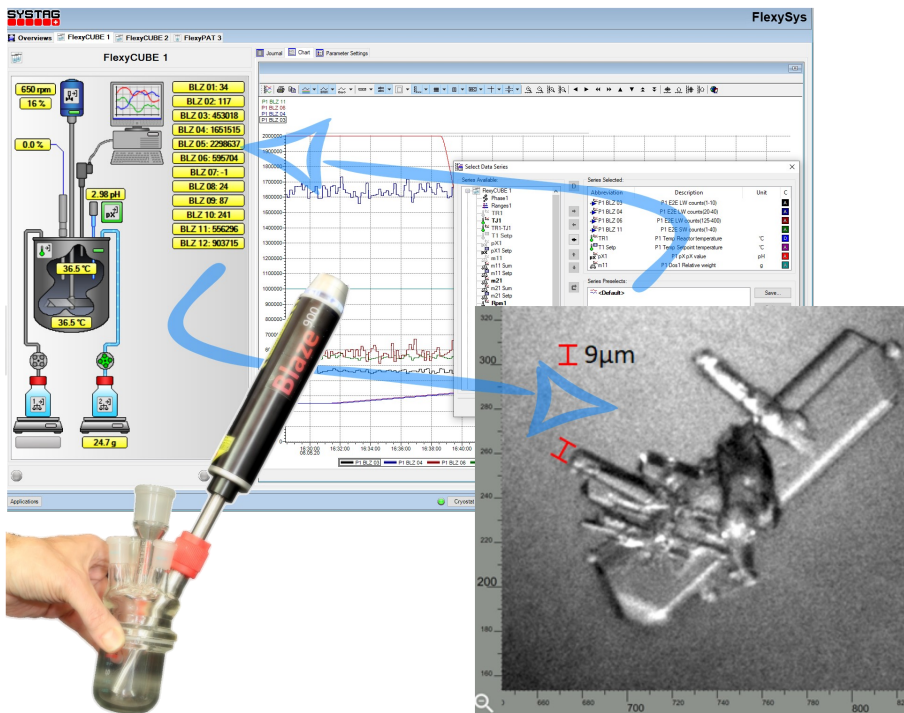


Symbiosis between Automation & Particle-Engineering



Particle microscopy

In particle and process characterization, the methods for determining particle size and number of particles (FBRM®) and particle visualization (PVM®), which were also developed by the current Blaze team, have become established in some application areas.

In many cases, it is difficult or impossible to understand the FBRM chord length data without the images from the PVM, which is why the application of both probes is necessary. This means a strong influence on the mixing behavior and thermodynamics in the reactor, a complex application and cost-intensive acquisition.

New technology

BlazeMetrics's new Blaze 400 and Blaze 900 optical probes now combine multiple analytical technologies for the first time in a single probe. This enables the simultaneous measurement of:

- Particle size, number & shape using improved chord length distribution (A-CLD)
- HDR microscopy
- HDR turbidity measurement
- Particle-focused Raman (optional)

with just one probe.

Automation & PAT

Automated laboratory reactors are now established applications in process research and process optimization. All the parameters are recorded and automatically logged in a laboratory journal.

Application-specific solutions allow efficient process optimization and the complete traceability of data.

In pharmaceutical science and agrochemicals, substances and their effectiveness often depend on the shape and size of the crystal. Consequently, in-process analysis technologies now have a high priority.

If we examine particle size, particle shape and particle distribution, a clever symbiosis with the automation of processes inevitably arises.

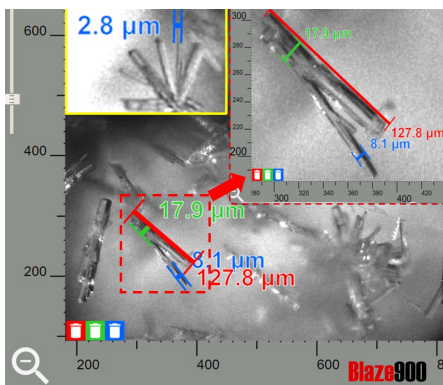
A powerful combination

This powerful combination, integrated into SYSTAG's automation solutions not only makes it easier to understand mechanisms when particles change, but also to influence or control them at the same time.

The double-sided OPC interface allows the FlexySys parameters such as temperature, dosing profiles, etc. to be displayed in the BlazeMetrics user interface together with the Blaze measurement data and images. Through the bi-directional communication of FlexySys with the BlazeMetrics software, the particle change behavior can also be directly controlled.

All the important parameters are available in the recipe control, as are the control commands for actions.

The BlazeMetrics solution can be integrated in all SYSTAG automation solutions. The standard probe measures up to approx. 3 l in the small FlexyCUBE reactors (100 ml) just as reliably as in the FlexyPAT double-jacket reactors.



HDR turbidity measurement

In addition to A-CLD and HDR microscopy, the BlazeMetrics combination also permits turbidity measurement with the highest dynamic range. The smallest, imperceptible optical changes in nanoparticles and in systems with the lowest and high concentrations of the disperse phase of up to 40% can therefore be measured.

Particle focused Raman

As an option, the Blaze probe can be connected to an external Raman system (532 nm and 785 nm). Compared to conventional Raman probes, Blaze particle-focused Raman can drastically increase the signal of particles of the dispersed phase and reduce the fluorescence of the liquid phase.



Specification

Applicable for all SYSTAG automation solutions from Release 3.1 onwards and with an OPC interface.

ePAT

FlexyCUBE

FlexyPAT

Reactor sizes: 100ml to 3000ml

Sensor length: 276mm (immersible)

Diameter: 12x58 mm, 14x142 mm, 19x72 mm

Temperature range: -10 to +100°C

Material: Sapphire, HC276/22, Kalrez

Pressure: up to 6bar

Optical fiber: 2.6m / 4.2m / 7.6m

Blaze 400: for particle systems <60 µm (recommended), trend from <0.6µm, size 0.8 to 60µm, trend to 220µm

Blaze 900: trend from <1.5µm, size 1.5 to 330µm, trend to 720µm

Conclusion

SYSTAG combines automated laboratory reactors together with in-process analysis and microscopy in one solution that is understandable and optimized for the user, space-saving, cost-optimized and yet in an expandable modular form.

HDR microscopy, A-CLD, HDR turbidity and PF Raman at 532nm and 785nm can be measured simultaneously.

FlexySys and the integrated recipe control system enable process control, depending on the above analysis values in real time.

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