



Best Cases 2024

PAT SOLUTIONS OVERVIEW

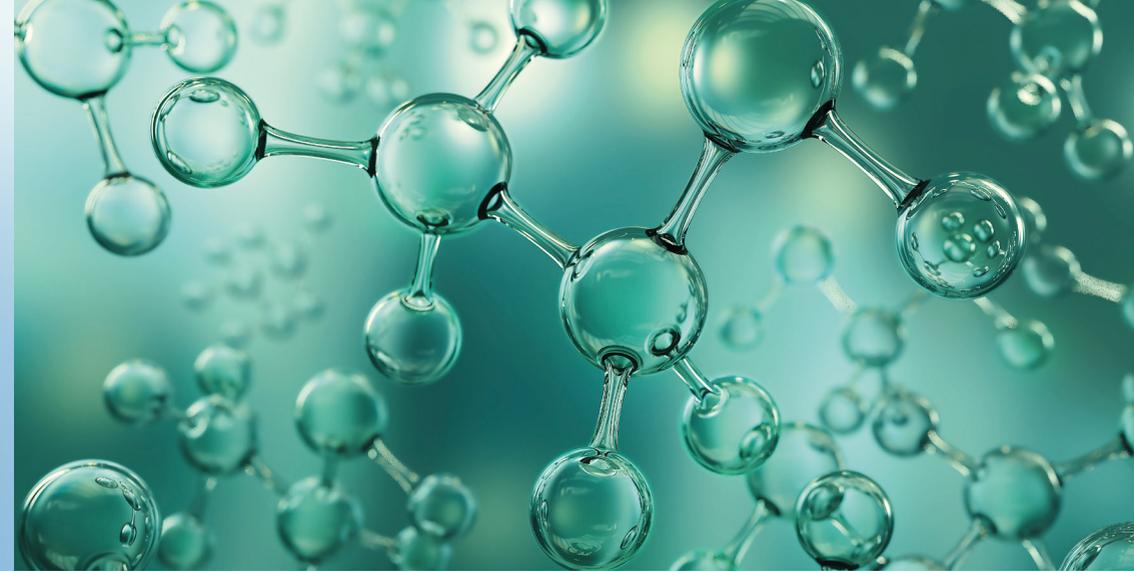
**BOOST YOUR PLANT PERFORMANCE
AND BRING IT TO THE NEXT LEVEL!**

Create Added Value in your Manufacturing Processes



Profit from the unique Hellma Solutions portfolio:

1. Full Turnkey Measurement Solutions
2. Custom Solution Development
3. Spectroscopy Sensors for Integrators
4. Feasibility Studies
5. Chemometric Services
6. Spectroscopy Services



Determination of Acetate and Ethanol in Aqueous Samples

Special Requirement: Very high accuracy requirements with 0.004 mol % in the aqueous sample to be analyzed.

Specific Solution: Consulting on suitable process analytical technology techniques and systems.

Developing a demand-driven custom solution with complete spectroscopic analysis. In addition, nine different measurements could be analyzed using Hellma's FMX Multiplexer.

Bioprocessing



Determination of Water Concentration in a Solvent for a Real-Time Batch Release

Special Requirement:

GMP regulated process in ATEX environment.

Specific Solution: Consulting on suitable process analytical technology techniques and suitable systems.

Selection, adaptation and implementation of an ATEX approved NIR measurement system which communicates in real time and under GMP regulations with the process control system via OPC UA.



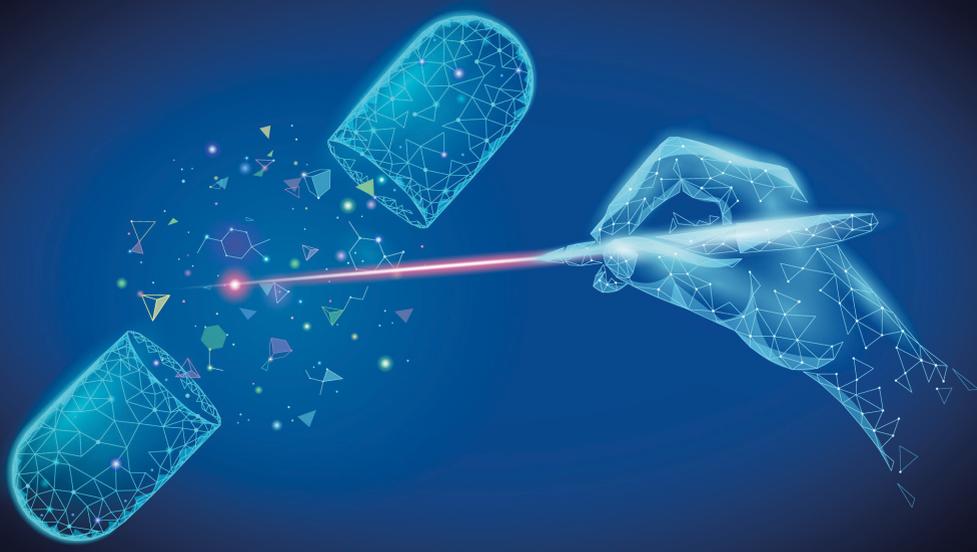
Determination of Color Values in Pigment Production

Special Requirement: Highly challenging spectroscopy model creation due to the complexity of the product and pigment manufacturing in ATEX environment.

Specific Solution: Realization of a chemometric model in the VIS range with integration of the entire spectroscopic measurement system into the process using high-precision reflection probes.

Pharmaceuticals

Paints and Coatings



Real-Time Monitoring of API Concentration in Pharmaceutical Environment

Requirements: Using already installed spectrometers, a selection of suitable measuring points had to be determined. Additionally, a chemometric service was required to model the concentration of active ingredients in tablet production.

Challenge: Finding representative measuring points for the active ingredient concentrations in a complex system together with the customer.

Our solution: Thanks to our experience in the PAT area and the associated PAT consulting, we were able to ensure the best possible analysis together with the customer and also create meaningful models for the active ingredient concentration with our chemometric service.

Plant manufacturer



Reaction Monitoring of Polymerization Processes

Special Requirement: Endpoint determination of the polymerization reaction of styrene using particle size and degree of conversion. Very fast and accurate measurements required due to rapid reaction progress.

Specific Solution: Consulting on suitable process analytical technology techniques and suitable systems. Setting up a demand-orientated system concept with spectrometers and optical probes for rapid and accurate real-time measurements.

The use of our high-end reflection probes ensure safe measurements without disturbing fluid dynamics.



Hellma[®]

WE LIVE PASSION FOR PROCESS ANALYTICS

- ✓ The world's largest program of **inline/online/atline spectroscopy probes and flow cells**
- ✓ **Smart Sensors** to evaluate or realize the metrological concept quickly
- ✓ Independent, owner-based company, which guarantees **fast and flexible results**
- ✓ **100 years of experience** in analytical spectroscopy
Hellma stands for **continuity and reliability**

© Hellma, May 2024

Hellma GmbH & Co. KG
Division Hellma Solutions
Klosterrunsstraße 5
79379 Müllheim / Germany

phone: +49 7631 182 3000
solutions@hellma.com
www.hellma.com/hellma-solutions