



# Cost Reduction by Inline Process Spectroscopy

- Reduced Waste, Raw Material usage, Energy consumption
- Reduction of Sampling and Laboratory cost, increased Safety
- Automated End Point Detection for Batch Processes
- Improved Process Control with Real Time Information on Chemical Composition for Continuous Processes



### Process Optimization by Inline Spectroscopy

Optimization of production processes by real time analysis of chemical composition.

### Measurement directly in the process

Industrial spectrometers for in-line use under process conditions. Systems optimized for 24/7 operation over many years with high stability, robustness and measuring speed.

### Process Spectrometer

All computational operations are implemented on system level (from the spectrum generation to the real-time application of evaluation models). No PC required for operation. The spectrometer works networked, intelligent and autonomous.

The device has an integrated PLC for the automated control of measurement procedures. Control of multiplexers, mechanical handling systems, implementation of project-specific control sequences.

The spectrometer directly communicates with your process control system via digital standard protocols of the process industry (e.g. Profibus DP, ModbusTCP, CANopen, OPC UA).



# Process Spectrometer

- Short payback period, very low operating cost
- No spectroscopic knowledge required
- UV/VIS, FTNIR, FTIR, Raman

# Applications

## ➤ Concentrations

Real-time analysis of complex material mixtures (liquid, solid, gaseous)

## ➤ Chemical Reactions

Inline process monitoring of chemical reactions (e.g. esterification, nitration, chlorination, polymerization)

## ➤ Solids and Powders

Inline quality control on films, fibers, food, pharmaceutical and technical powders, ash, etc.

## ➤ Coatings

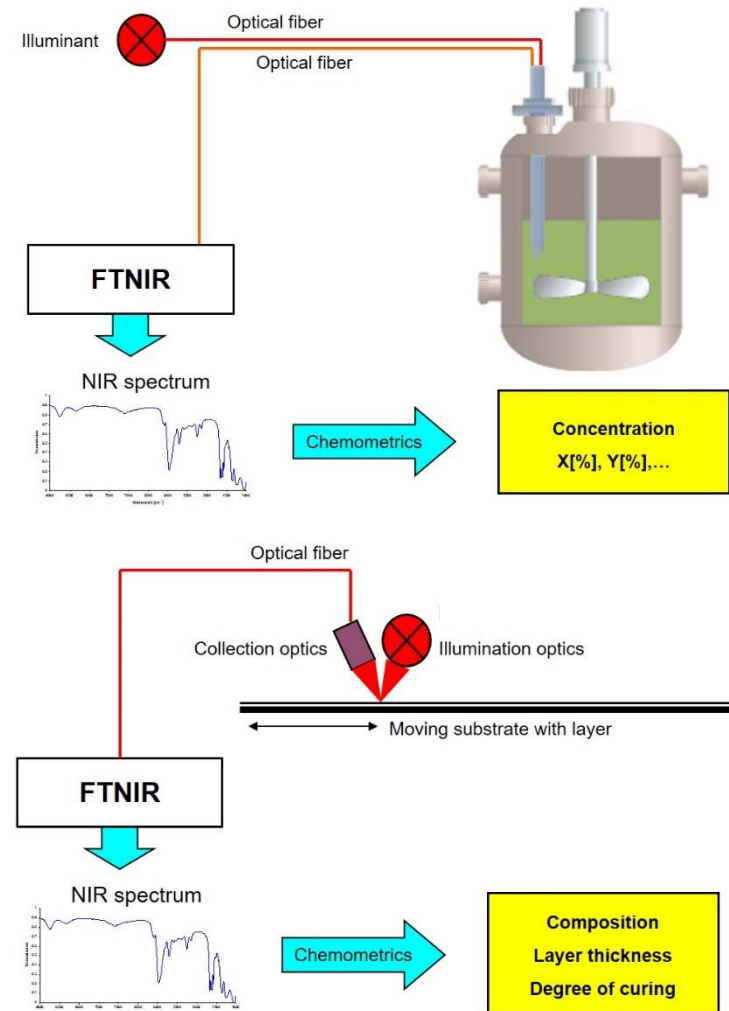
Inline monitoring in paper, film and steel finishing

## ➤ Gases

Inline analysis of process gases

## ➤ Colorimetry

Inline color measurement of solid and liquid substances.



# Service & Support

## ➤ Analysis of your production process

How can you get more quality information in real time at critical points in your manufacturing process?

## ➤ Feasibility studies

Preliminary examinations in the lab, pilot plant or time-limited test operation in your production plant

## ➤ Hardware

Spectrometers (UV/VIS, FTNIR, FTIR, Raman)  
Light sources, optical fibers, probes  
Development of specific hardware

## ➤ Software

Automation, communication, visualization

## ➤ Chemometrics

Multivariate data analysis & modeling  
AI for automated model optimisation

## ➤ Support

Maintenance of hardware and software  
Professional personnel training  
Availability: 24h a day / 7 days per week

