

APPLICATION NOTE - NIR ANALYSIS of **CURD / CHEESE** with *ZEISS Corona extreme* or *ZEISS Corona process*

Target Industry:
Dairy Industry
with
Cheese

INTRODUCTION:

NIR-Analysis can deliver results **very quickly and cost efficient** for organic parameters e.g **moisture, fat, dry matter, pH** and many more. Wet chemistry analysis is time and cost intensive when it comes to great numbers of samples. The non-destructive NIR measurement allows rapid measurement and can determine multiple components at the same. With the ZEISS Corona Spectrometer range this can be done even in the running process. The outstanding performance and quality of the **Carl ZEISS Spectroscopy** analyzer and the application expertise of **Noack & Co GmbH**, guarantee our customers the most reliable results.

THE ANALYZERS:

Few other spectrometer systems from **Carl ZEISS Spectroscopy** incorporate as much application-related experience as the new **Corona extreme** and **Corona process**. The spectrometers feature fiber free, high energy illumination with outstanding optical properties and internal referencing.

The **Corona process** is able to measure in a distance of up to 600 mm and includes also **color measurement**.



THE ONLINE MEASUREMENT:

There are two possible hardware solutions for online process control. The **Corona extreme** is used for mounting on tubes in **direct product contact** (e.g for fresh cheese, processed cheese...) and the **Corona process** is used for measurement from a **distance** (e.g for cheese blocks on a conveyor). The implementation in the process is done via **GEA flanges** (for Corona extreme) or via mounting over a conveyor belt (for Corona process). The measurement is running continuously (integration time of approx. **15ms**). All signals for automatic process control can be provided by individual solutions.

The results are stored in the internal software database or can be transferred to external network systems. The results and spectra can be easily extracted for further use or analysis.

Example Hard Cheese



Figure 1: Corona process over conveyor

Target:

Adjusting of the Cheese-Press to optimize the water content

Target:

24h real time process control of the main parameters

Example Processed Cheese / Curd, etc.



Figure 2: Corona extreme on GEA flange

YOUR ADVANTAGES:

- 24h real time process control (15 ms integration time)
- Full signal integration to process control systems (analog or digital)
- Extreme robust design for all applications
- Very low cost of ownership
- Easy installation to the production line (e.g. with GEA Tubes)
- Cost saving and increase in profit due to process optimization

CALIBRATION PERFORMANCE:

The table shows examples for possible parameters. The minimum and maximum values indicate the prediction range for the parameters available. SECV (Standard Error of Cross Validation) indicates the prediction performance.

Parameters for processed cheese	Unit	Calibration Range		SECV
		MIN	MAX	
Dry Matter	%	43,0	46,0	0,2
Fat	%	32,0	34,7	0,2
Fat in Dry Matter	%	calculated value		
pH		4,5	4,8	0,02

Parameters for hard cheese	Unit	MIN	MAX	SECV
Moisture	%	42,0	46,0	0,4
Fat	%	25,5	29,0	0,4
pH		5,30	5,59	0,04

Figure 3: Calibration file details

SOFTWARE:

ZEISS InProcess Software is designed to meet the customers need in every possible application. Its modular design is perfect for the creation of customized views and procedures. You can smoothly change the setup from Laboratory Mode to Online Mode without great adjustments.

The graphic user interface is comprised of icon menus giving it a familiar feel of operation at first sight. In addition, users may configure sequences, calculations and display formats based on their individual requirements.

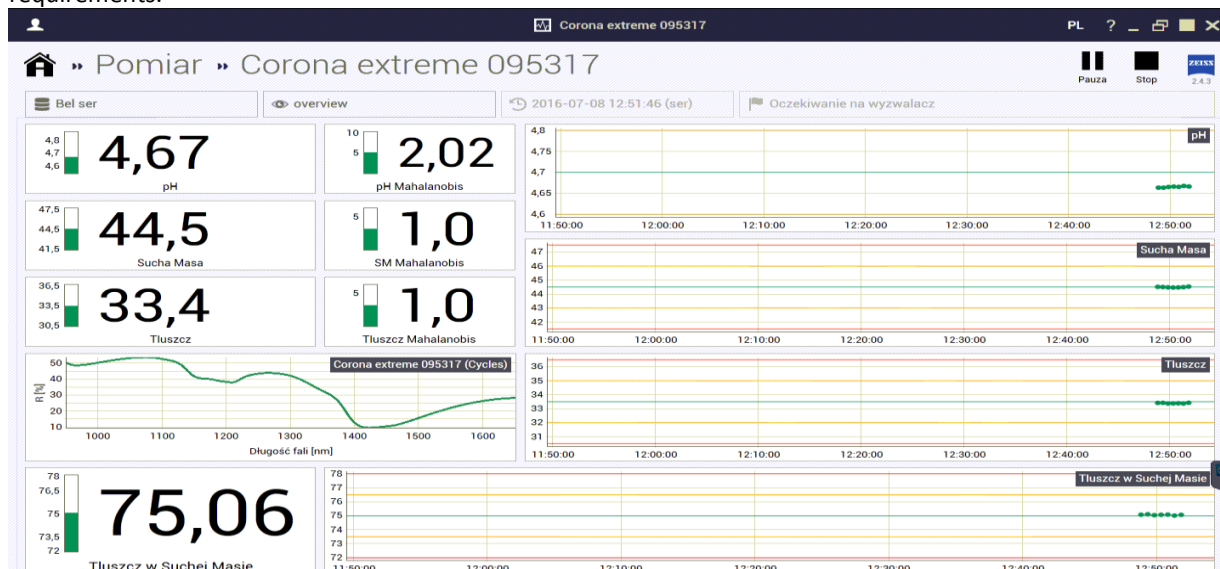


Figure 4: ZEISS InProcess Software shows measurement results – Example processed cheese