# APPLICATION NOTE - NIR ANALYSIS of MEAT *with ZEISS Corona process*

## INTRODUCTION:

NIR-Analysis can deliver results **very quickly and cost efficient** for organic parameters e.g **fat, protein, water** and many more. Wet chemistry analysis is time and cost intensive when it comes to large 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 ANALYZER:

Few other spectrometer systems from **Carl ZEISS Spectroscopy** incorporate as much application-related experience as the new **Corona process**.

The spectrometer features fiber free, high energy illumination with outstanding optical properties and internal referencing.

It is even able to measure in a distance of up to 600 mm and includes also color measurement.

## THE ONLINE MEASUREMENT:

Different applications are possible. In the **Sausage production** the Corona process is placed over a conveyor belt between the mincer and the mixer. The **minced meat** is measured and after 80-90% of the batch load, according to the average fat content, the final ingredients are adjusted to optimize the fat level in the batch.

Another application is the measurement of **meat trimmings**. The E2 boxes with the trimmings are put on a conveyor belt and are moving below the Corona process. The average fat-content of the trimmings is measured and can be used for classification and separation (e.g. 70/30, 80/20...) of the trimmings.

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

**Example Sausage production**

**Target:**
Optimization of the fat content

**Target:**
Classification of meat-trimmings according to fat content
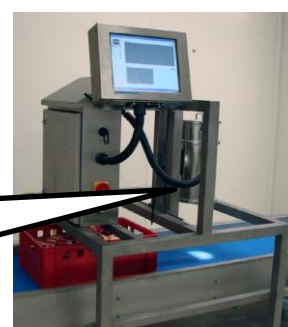
*Figure 1: Corona process over conveyor after meat mincer*

**Example Meat trimmings**

*Figure 2: Analyzing of meat trimmings*

**YOUR ADVANTAGES:**

- **Continuous measurement of all parameters**
- **Easy installation into the production line**
- **Extreme robust design for all applications**
- **Very low cost of ownership**
- **Cost saving and increase in profit due to process optimization**

**CALIBRATION PERFORMANCE:**

The table shows the available parameters included in the start-up-calibration. 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 minced meat | Unit | Calibration Range | | SECV (*) |
|---|---|---|---|---|
| | | **MIN** | **MAX** | |
| Fat (low) | % | 4,9 | 40,93 | 2,3 |
| Fat (high) | % | 41,0 | 75,41 | 4,5 |
| Water (low) | % | 17,5 | 45,7 | 2,7 |
| Water (high) | % | 46,2 | 72,5 | 1,9 |
| Protein | % | 8,2 | 23,5 | 1,3 |
| BEFFE (collagen free protein) | % | 5,2 | 22,3 | 1,3 |

*Figure 3: Calibration file details*

***(\*)**Note: Table shows a global meat calibration and has to be adjusted to specific customer products.*

**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.
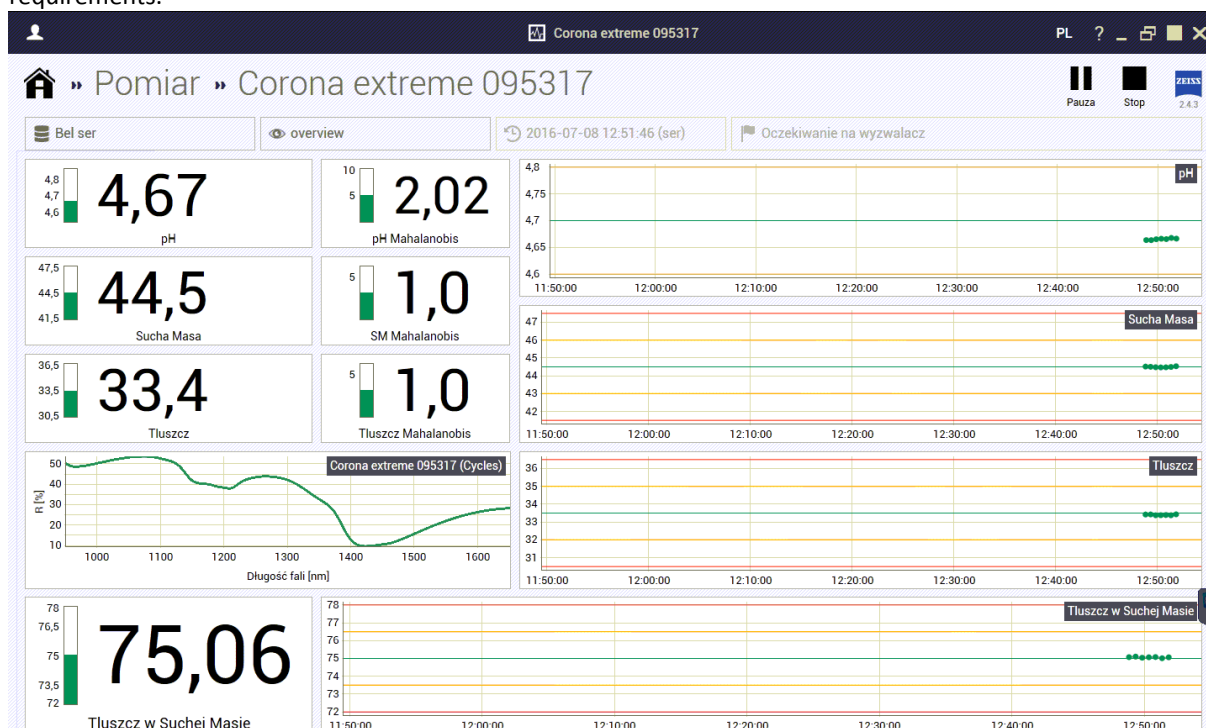


Figure 4: ZEISS InProcess Software – Example screen for measurement results