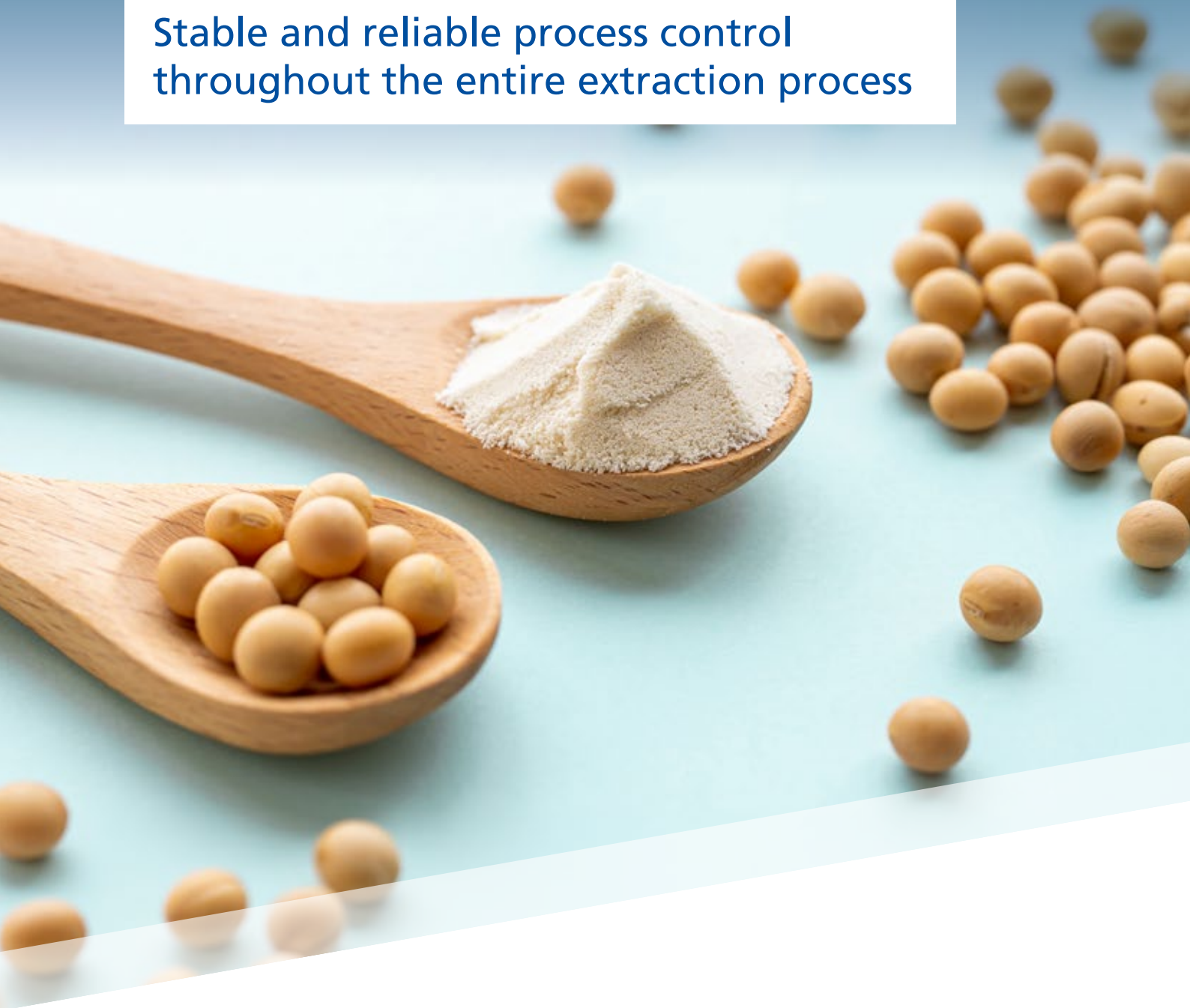
# TOTAL SOLIDS CONTENT IN PLANT-BASED PROTEIN EXTRACTION

Stable and reliable process control throughout the entire extraction process



QUALITY MADE IN GERMANY

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# TOTAL SOLIDS CONTENT
# IN THE PROTEIN EXTRACTION

The increasing in global demand for sustainable and qualitative plant-based proteins has intensified the search for alternative materials from the already well-known soybeans. Fava beans (Vicia faba), also known as horse beans, have become an increasingly more interesting protein source due to their overall usability in the food industry specially as a plant-based protein alternative to conventional animal protein.
The fava beans normally contain between 26 – 35 %DM protein.

**Nowadays there are two main ways to extract the protein out:**

- Dry Extraction
- Wet Extraction

These two methods have their advantages and disadvantages, but each extraction method serves a different industrial purpose.
This application focuses mainly on the wet extraction. One of the major factors of the wet extraction is to produce high purity protein ranging from 85% – 92%. This purity is mostly required in the dairy, meat supplement and beverage industry. The extraction process starts with the preparation of the beans, solubilization, centrifugation or decantation, precipitation, washing and finally drying the extracted protein.

## Precise & reproducible microwave measurement

For this application the microwave technology is used specially in the decantation/ separation, where the dry matter content of the protein mixture is measured and monitored for optimal separation ratios. The optimal separation/decantation values of the protein mixture depend on the manufacturer's specifications, however between 24 - 26 %DM is a good reference. To be able to constantly operate the optimal separation/decantation a reliable online measurement is needed. With the Micro-Polar LB 566 measurement system from Berthold it is possible to measure the total solids with high repeatability and accuracy, thus guaranteeing stable and reliable process control throughout the entire extraction process.

**Food safety through international quality standards**

## Measuring principle

The MicroPolar measuring system uses the special dielectric property of water. It generates microwaves that interact predominantly with the water molecules. This interaction induces a weakening of the microwave energy, which can be detected as phase shift and attenuation. As the phase shift and attenuation change is directly proportional to the water content, this allows the determination of the concentration of the medium with high accuracy. Berthold's superior multi-frequency technology guarantees highly stable and reliable measurements that are unaf-fected by interferences caused by reflections or resonances. The microwave power of a MicroPolar system is so low (max. 10 mW) that the material to be measured is neither heated nor changed in any way.

*Schematic representation of a water/solids content measurement on a pipeline with FlowCell*

## Customer Benefits

- Online monitoring of the water or solids content during extraction process
- Precise and reliable measurement < 0.2 wt.% (standard deviation)
- Simple system calibration
- Production optimization

## Characteristics

- Multi-frequency technology for dynamic plausibility control of the raw signal
- Representative microwave measurement captures the entire pipeline cross section
- CIP and SIP resistant materials
- Low-wear and maintenance-free

## Typical applications

- **Plant-based meat** (burgers, sausages, nuggets)
- **Dairy alternatives** (yogurts, cheese analogues)
- **Nutrition** (protein powders, meal replacements)
- **Bakery** (protein breads, snacks)


# THE EXPERTS
# IN MEASUREMENT TECHNOLOGY

Berthold Technologies stands for excellent know-how, high quality and reliability. The customer is always the focus of our solution.
Using our varied product portfolio, our enormous specialized knowledge and extensive experience, we develop suitable solutions together with our customers for new, individual measurement tasks in a wide variety of industries and applications. Berthold Technologies is specialised in radiometric process measurements for over 75 years. More than 35 years ago Berthold expanded their portfolio and introduced microwave technology to the sugar industry. Today sugar mills worldwide depend on measurement solutions from Berthold. Our expertise in microwave technology is one of our core competences – the vast amount of systems in operation in the sugar industry worldwide speaks for itself.

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