



## **NIRMaster™** Milling and Bakery

Changing consumer behaviour contributed a lot to increased popularity of bakery products and rapid growth of the business. Consistent production and food safety are important for flour milling and bakery producers. Understanding customer needs in milling and bakery industry, BUCHI has designed the first standalone FT-NIR Spectrometer specifically for that industry – the NIRMaster™.



## **NIRMaster™** Bring Light into Your Production

Get more analysis information, faster savings, higher quality and better understanding in milling and bakery production with polarization Fourier-Transform Near-Infrared Spectroscopy (FT-NIRS). Rapidly control the quality and nutritional facts of raw material, ingredients and final products using BUCHI NIRsolutions. The NIRMaster™ is the first dedicated FT-NIR standalone spectrometer. Its easy-clean design and high ingress protection (IP) meet the specific needs for at-line analysis in milling and bakery production.

### Where BUCHI NIRsolutions can help you:

BUCHI NIRsolutions provides dedicated at-line and off-line NIR equipment. These instruments set up at different locations in the production plant provide significant information for milling, bakery production and quality control to improve your business.



### A contribution to your profit

*"Barilla Food Company has always been characterized by clear focus to quality, as demonstrated by significant investment in research and innovation. Since 2005 the company has put into action a network of Fourier Transform NIR Spectrometers for Quality Control Laboratories of its Italian bakery plants. This Barilla's Network of FT-NIR instruments, originally used only for the analysis of chemical and rheological parameters of wheat flour by reflectance, has been recently extended to the control of other raw materials and some finished products by developing quantitative as well as qualitative screening methods."* Barilla

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Various constituents of flour and baked products such as moisture, protein, starch, fat, salt, sugar, fiber, ash, particle size and many more can be quantified and qualified. Please refer to our application overview.

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## 1. Quality control of raw materials and ingredients



At uploading bulk flour or at bakery silos:

- Prevent unsatisfactory loads of raw materials
- Check flour shipment for conformity to specification
- Determine quality of whole and ground grains (e.g. wheat, corn, rice, tapioca)
- Quantify important factors of raw materials for better quality of finished products (amylose and amylopectin content)



## 2. Quality control of bakery mixtures and dough



At production site:

- Predict flour yield, water absorption, and dough development time
- Quality verification of bread baking mixtures
- Determine ash content affecting baking performance and the crumb color of baked bread
- Determine starch damage and water absorption during the milling process



## 3. Quality control of finished products



At production site or packing area:

- Control quality of finished products (e.g. bread, biscuits, flour, confectionery, pasta, and breakfast cereal)
- Ensure compliance with any statutory compositional requirements (e.g. moisture content of bread)
- Provide data for nutrition labelling





## **NIRMaster™ Makes Your Job Easy** The Dedicated Solution for Your Needs

The competitiveness of the milling and bakery industry forces producers to take strategic actions for quality control and product optimization. BUCHI FT-NIR polarization technology makes this job easier!



### **1. Easy-clean design increases food safety day by day**

The hygienic easy-clean design and high ingress protection (IP) support your routine work in harsh environments. The NIRMaster™ is available in food-grade PMMA housing or stainless steel housing.

### **2. Polarization FT-NIR reduces costs**

The modern and robust NIRMaster™ based on fast and precise polarization FT-NIR technology, provides accurate and reliable results for multiple parameters simultaneously. Improve your production process with this fast and durable system.

### **3. Faster results speed up your decisions**

The NIRMaster™ with its built in PC, preinstalled software and quick-start calibrations can be quickly set up and put into operation. With FT-NIR you can analyze your samples within seconds.

### **4. Reliable hardware for reliable business**

The NIRMaster™ is supported by a twin-lamp safeguard for uninterrupted operation even in cases of lamp failure. Based on robust and accurate polarization technology it is more shock resistant than any other FT-NIR.

### **5. Easy-operation for a lean workflow**

The NIRWare Operator is the easy to use and ergonomic software interface which can be tailored to your specific needs. Inputs are collected easily and the analysis results are displayed in an optimal way. With an optional touch screen and robust accessories, like a barcode scanner or the easy-spin drive, efficiency in daily work can be improved even more.



## 6. Quick-start calibrations to gain time

In cooperation with many of BUCHI's long-term customers we have concentrated data and experience in our pre-calibrations. These powerful quick-start calibrations enable you to efficiently analyze a broad range of your sample constituents.

## 7. Easy calibration transfer preserves competence

BUCHI NIR spectrometers are identical by design. Spectra and calibrations can be exchanged between laboratory and production units - without any calibration standardization. Furthermore, your existing calibrations, even data from other suppliers, can be transferred easily to your new BUCHI FT-NIR spectrometer.

## 8. NIRCAl creates better performance

Use the powerful NIRCAl software to evaluate your production data. Keep an eye on what is going on at your sites. For evaluating or updating a calibration NIRCAl is the ideal tool. The patented Calibration Wizard and the comprehensive NIRCAl Toolbox support even unexperienced users building up powerful calibrations.

## 9. NIR Networking for local and global control

For local data handling the LIMS interface connects your BUCHI NIR to laboratory information or enterprise resource planning software using standard interchange formats. For global players NIRAnywhere is the comprehensive network management tool. Headquarters can automatically backup data and update applications by remote connection. You gain full access and transparency to all your production and QC relevant data.

## 10. NIRMaste<sup>TM</sup> as part of all-embracing NIRSolutions

BUCHI NIRSolutions not only offers leading hardware technology, but also the most comprehensive standard software, applications and reference methods as well as quality service and support to help you work effectively and efficiently. The BUCHI NIRMaste<sup>TM</sup> is an integral part of BUCHI NIRSolutions.



## **NIRSolutions®** Listening, Understanding and Responding

BUCHI is the world leading supplier of dedicated solutions for milling and bakery industry. We provide analytical equipment fitting the needs of our customers. The long history of BUCHI in this special market segment gives our customers the possibility to choose the best solution for their needs. We provide the classical reference methods and NIR for quality control of milling and bakery products.



### **Enter the NIRSolutions community**

The BUCHI NIRSolutions community is built by our international customers from the milling and bakery industry and our global expert network. Based on experience and know-how we have designed and created the BUCHI NIRMaste<sup>TM</sup> together.

### **Global expert network**

BUCHI has developed a global unique network of NIR specialists in milling and bakery quality control, present in more than 60 countries. Our network is based on shared experiences, fast and flexible teams, intensive trainings and access to all relevant resources. These synergies are key features for our unique support structure.

### **Global service network & training**

Our excellence is global and we have local services to fulfill your requirements. We offer service contracts, preventive maintenance protocols, IQ/OQ, on-site service and training. We guarantee fast response, phone and web-based support. For our key customers we offer tailored solutions, services and support.

### **Reference methods & feasibility studies**

BUCHI has gained high expertise and market share with relevant reference methods like Kjeldahl or extraction, which are official methods in milling and bakery control. The accuracy and precision of our NIR applications is based on the knowledge of both, NIR and reference methods. We support you with feasibility studies and professional competence.





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## Advantages of BUCHI NIR Spectrometers:

Compared to classical analytical methods the NIRMaste<sup>TM</sup>

- Enables you to have faster analytical results
  - Speeds up decision making
  - Grants you low analysis costs per sample
  - Measures several parameters simultaneously
  - Improves quality and optimizes overall profit
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## Advantages of polarization FT-NIR over any other NIR technology

- Most accurate and reproducible NIR technology
  - The polarization interferometer is insensitive to vibration
  - Increase of information content and application capabilities
  - Calibration transfer without any standardization
  - Twin-lamp safeguard for uninterrupted operation
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## BUCHI NIRsolutions covers all your needs – from laboratory to production environment

Using the same technology as the NIRMaste<sup>TM</sup> the NIRFlex N-500 is the flexible solution for your laboratory. Swap between different measuring cells – fitting your demands. Our customized solutions will make your BUCHI FT-NIR spectrometer become more versatile: from chemical compositions up to rheological properties.



# NIRMaster™ The Complete Solution



## Performance

- Measurement of several parameters simultaneously
- Low analysis costs per sample



## Durability

- Robust technology
- High ingress protection (IP)
- Standardization-free calibrations



## Speed

- Quick-start calibrations
- Faster analytical results
- Speed up decision making



## Reliability

- Accurate and robust polarization FT-NIR
- Twin-lamp safeguard



## Simplicity

- Built-in PC
- Touch screen use
- Easy-clean design



## Competence

- Comprehensive applications
- Global expert network
- Best service and support

## Quality in your hands

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