

Technical Note (Ref. customer interview): PROBAT: "Brabender is always our reference method"

Using the Brabender MT-CA Moisture Analyzer in the coffee industry

The quality of coffee depends on its moisture content. It must be carefully monitored throughout the entire manufacturing process in order to guarantee stable quality at a high level. PROBAT, a leading global manufacturer of machines and equipment for processing coffee, has been working on this for over sixty years in collaboration with the laboratory device manufacturer Brabender GmbH & Co. KG from Duisburg

A conversation with

- Thomas Kozirowski (TK), Executive Vice President of Technology / R&D at PROBAT,
- Sarah Bongers (SB), Chemical Technician / Technology and Training at PROBAT and
- Alexandra Petz (AP), Area Sales Manager Food Europe and South East Asia at Brabender

PROBAT in brief

150 years of experience, 115 patents and a global market reach of 70 per cent: PROBAT is the global brand and technology leader in the coffee roasting machine and equipment industry. The family-run business shares its knowledge with (potential) clients in practical seminars and cooperates intensively with international institutes of higher education. A PROBAT machine is manufactured in multiple, decade-long, tried-and-tested process steps before it leaves the factory.

Brabender in brief

Brabender is a technological leader for the manufacture and sale of highest-quality testing instruments. They are used throughout the world to check material quality in all areas of research, development and industrial manufacturing in the food and chemical industries. The long-standing company was founded in 1923 and consults with customers individually to plan and supply individual devices or complete sets of equipment for all uses as required. It has had a partnership with PROBAT for over 60 years.



Fig. 1: Representing a partnership of over 60 years: Alexandra Petz (left, Area Sales Manager Food at Brabender) and Sandra Bongers (right, Chemical Technician / Technology and Training at PROBAT)

Last year, PROBAT celebrated its 150th anniversary. Mr. Kozirowski, how does the company see itself in terms of tradition? What are its task and its purpose?

TK: PROBAT has been a family-run business for generations, and it has been working for and with the coffee industry for over 150 years. Competence, commitment, solution-orientation and partnership in all of our projects are our hallmark. From accepting raw products in the coffee factory to loading the packing machines and controlling the equipment in a factory, we participate in the entire coffee manufacturing process. The development, construction and assembly of roasting machines and grinders as well as the planning and implementation of complete industrial production plants are all part of our range of services. Additionally, machine and equipment controlling as well as environmental technology and a range of services are also a part of our product portfolio at PROBAT. Even the laboratory equipment is a part of it, to a certain extent. Everything that is needed in a coffee roastery is within the scope of our work. Our customers can always rely on us for a state-of-the-art solution at the best price.



Fig. 2: Thomas Kozirowski, Executive Vice President of Technology / R&D at PROBAT

Who are your customers and how would you describe them?

TK: Anyone with a global name and position in the coffee industry is one of our customers – from large-scale industry, to important retail chains, to successful private manufacturers. This means that of every three cups of coffee that are drunk worldwide, two of them were manufactured with our equipment.

PROBAT is the global brand and technology leader in the coffee roasting machine and equipment industry. How can you be sure that it will remain so?

TK: We always endeavor to provide our customers with the best solution. So we discuss every incentive and idea in our own research and development department. We are especially proud of our technology department. This is where all of our roasters, grinders and technical equipment at a large industrial scale can be found. This allows us to drive product development with our customers and to develop new approaches together. We also look into the future through our cooperation with different research institutions across the globe. Thanks to this academic cooperation, we are ahead of the curb with regard to the future development and technologies related to the product of coffee.

You also use innovative technology for moisture analysis. Ms. Bongers, why is this moisture analysis important for PROBAT?

SB: The moisture in green coffee influences how the beans will act later on during the roasting process. Because coffee is a natural product, the moisture content is not always consistent. It varies depending on the type of coffee and the region it's from, for example. Normally, coffee is stored for multiple weeks before and during transport. If the moisture content is over 13 per cent, then it might go moldy and be subject to other risks that affect its quality. That's why it's important for us to measure the moisture content of green coffee during quality control when the goods are first delivered to us. This way, we can make sure there are no quality risks and adapt recipe parameters, where necessary.

What procedure do you use to determine the moisture content?

SB: Firstly, we work with near-infrared spectroscopy, NIR, which provides results within seconds. The calibration is essential to the success of this method and contributes to the precision of the moisture reading. This means that a value will be obtained that can be used on the sample to be tested. This differs depending on region and requires a reference for comparison. So, as a reference, a direct measurement procedure such as the oven drying method is required for the moisture measurement. Our reference is always the Brabender Moisture Tester MT-CA, which conforms to the oven drying method, but also provides certain benefits compared to conventional oven drying.

We will get to the advantages of the MT-CA. Firstly, tell us about how the Brabender Moisture Tester works, Ms. Petz.

AP: The device is an electronic moisture analyzer which works according to the principle of heat-drying in circulating air. It determines the weight loss resulting from drying out the sample material. There is a built-in electronic precision balance underneath the drying chamber. The balance integrated into this device can weigh samples either individually or in a series, both in front of the chamber before drying and immediately after drying and reliably weigh the materials in the drying chamber while they are still warm. The MT-CA balance is certified according to the ISO norm 712 and works according to the ICC standard no. 110/1.

How is the Brabender Moisture Tester MT-CA used at PROBAT?

SB: Unlike in the coffee-producing industry, we do not use the MT-CA for quality assurance; we use it as a basis parameter to determine the influence or changes in parameters for incoming goods inspection. How precise is the result if I add a liter more of water? How will that affect the coffee? How precisely can I determine this to give the customer accurate feedback? So our employees who receive the customer coffee can immediately determine whether a green coffee is drier and if the recipe parameters must therefore be adjusted.



Fig. 3: PROBAT relies on the MT-CA from Brabender to determine moisture in coffee upon delivery.

The oven drying method is known for being precise, but also difficult and tedious in practice. What benefits can the Brabender Moisture Tester MT-CA claim in this respect?

AP: The humidified air is constantly replaced in the MT-CA. This allows the drying process to take place far more quickly than in a classic drying oven without ventilation. The time required to dry green coffee in the MT-CA at 130 °C is, for example, only 60 minutes, as opposed to approx. 16 hours at 105 °C in a classic drying oven. Additionally, the Brabender moisture tester works almost completely automatically: You just need to put the sample pan on the balance, tare it and then manually weigh the sample. When the balance is stabilized, then the sample will be placed in the drying oven. After the drying process is complete, the sample will automatically be weighed in the drying chamber, and the water loss in grams and percent will be calculated. The water content can therefore be determined to a 0.1 percent precision.

What are the benefits of using the MT-CA in daily workflows, Ms. Bongers?

SB: In addition to conventional drying, user error is reduced to a minimum thanks to the MT-CA's automatized procedure. There is no need to let the desiccator cool, which is a time-consuming step and increases the source of incorrect readings. It's especially practical that the MT-CA is equipped with a turntable. It allows the time-controlled fit of up to ten samples without ongoing measurements interrupting other samples or causing them to be incorrect. An invaluable advantage is that the results no longer need to be manually copied out from A to B.



Fig. 4: Sandra Bongers performing one of the only manual steps of moisture analysis with the Brabender MT-CA.

Digitization is a buzzword at the moment. How does the MT-CA contribute to this?

TK: The MT-CA provides perfect support in the age of digitization thanks to its intelligent Brabender MetaBridge software. With a memory of 64 GB, multiple drying and reference curves can be overlapped, recorded and saved without problems. With the MetaBridge software, different users can follow the measurements live from different devices - no matter where they are. The results of the measurement are then simply evaluated, printed and exported with the software. It's even possible to call up old measurements or to do a follow-up inspection of the start and end weight measurements.

So, what's your conclusion regarding the use of the MT-CA at PROBAT?

TK: The data integration process for data that we obtain from moisture analyses is very important to us. We can use it to optimally assure our own quality process with the MT-CA. Our investment in the Brabender Moisture Tester was certainly worthwhile and we would definitely recommend it for use in large laboratories.

Mr. Koziarowski, Ms. Bongers. Ms. Petz - thank you so much for the interesting discussion!

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