

Bäckerei Plücker, Waldeck, Germany

An ideal combination

“Originally, we just wanted flue-gas ovens,” says master baker Christian Plücker with a smile. He had also looked at some wagon oven systems with stone slab modules. But in the end he opted for two “flue-gas ovens”, which can also produce baked goods with the same characteristics as products baked in a thermal oil oven. This is because the gas-fuelled MIWE ideal e+ is able to simulate baking temperature profiles that are usually only possible with ovens fuelled by thermal oil. At the same time, it retains the flexibility of a heating gas oven (which is also called a flue-gas oven).

It might sound like MIWE has invented the perfect all-in-one solution for bakeries. But that’s probably going a little too far and it would mean that MIWE engineers are absolute geniuses. But the innovators in Arnstein, Germany, did manage to develop a completely unique feature in the world of ovens: a sophisticated variable burner.

Older burners operated either at full power or, in the case of two-stage burners, at half power -- or they would be off. This burner can supply precisely the amount of energy needed by the system. It features power levels between 0 and 100 percent. This is not only thanks to the burner (currently only available in a gas version) but also the sophisticated data processing and control technology of the MIWE TC Touch Control.

Master baker Plücker can tell you what this means in practice: “We transferred the baking temperature profiles of the thermal-oil tunnel oven directly to the MIWE ideal e+.” For example, at Plücker, mixed flour bread is placed in the oven at 265°C. In a thermal-oil oven, the temperature drops relatively slowly because of its high energy storage capacity. Thermal oil can store approximately 2500 times as much energy as flue gas.

Heating gas ovens are different: Because heating gas is not able to store as much energy, the oven temperature →



Christian Plücker shows off his baked goods.



For Christian Plücker, baking on the deck plate is the only way to bake unmoulded products.

drops more swiftly. If the burner were then to heat up (at full power!), the bread could be scorched. "Obviously no one wants that," says Christian Plücker, looking at the baking temperature profiles of his ovens.

This bakery in the north of the state of Hesse is well known for its bread. And it's no coincidence either. Sour dough, long proofing times, and the right oven for each type of bread are key factors in the success of this family business. The company also has a lot of space available on its premises, which is located in the Alraft district of the town of Waldeck. As a result, the bakery had room for yet another expansion last year. "We simply needed more space," says Christian Plücker.

The dispatching area was relocated to the new room, where the two MIWE ideal e+ ovens are also located. In combination with the MIWE athlet loading system, the ovens can be loaded and unloaded just as easily as the large tunnel oven installed only a few metres away in the old section of the building.

"For an operation as large as ours that specializes in bread, there's no getting around having a large oven like this," says Christian Plücker, explaining the company's operations. Only a few varieties of bread are baked in this oven, but in large batches. Unlike other companies in the industry, Plücker does not put any bread in the oven before two in the morning. "That's because we want to deliver the freshest bread possible."

To achieve this goal, the bakery uses refrigeration management techniques for many varieties of bread. Ten out of 25



The evenness of the baking results is impressive.

varieties are proofed overnight at temperatures just above freezing. By 4:30 am, one of each variety has been baked and is ready for dispatch.

In addition to the tunnel oven, four thermal-oil wagon ovens are used. These are mainly for baking tin loaves. Until recently, baguettes were also baked in this oven on special trays. "Since we switched to the MIWE ideal with variobake, our baguettes sales have increased by 20 percent," says a happy Christian Plücker.

Together with white bread and mixed flour bread, baguettes are now one of the products baked in the decks of the MIWE ideal e+. The bread is proofed on removable shelves and is gently placed on the decks by the MIWE athlet. "Just by baking it directly on the baking plate, the bread comes out completely different," explains master baker Plücker. Despite his systematic and intelligent use of technology, he still views his company as an artisan bakery. And that's also the image he wants to project to customers. "Baguettes baked on trays -- that has a pretty industrial sound to it."

Plücker also used the same baking temperature profiles as wagon ovens, which can be simulated thanks to the intelligently controlled burner and the TC control system. As a result, the bakery achieves the same results with the usual crust formation, especially when baking wheat products. And thanks to the new technology, energy consumption is reduced to an absolute minimum.

Even short heating intervals with a standard burner would not allow for this. Continuous, short counter-heating would

soon result in excessive mechanical stress. In addition, minimal burner operating times would mean that combustion would always be incomplete and high concentrations of harmful substances would be injected into the system.

But the question still remains: Why doesn't the company just use a thermal-oil tunnel oven? Christian Plücker's response is quick: "It's a matter of batch size and of flexibility." For example, baguettes are baked and delivered several times in the morning. Although partial loading is possible in the tunnel oven, in Plücker's experience, it always affects quality and consumes more energy.

Plücker uses a two-circuit MIWE ideal e+. This means that three of the six oven decks can be operated with separate baking programs. This is not a new feature, but together with the burner, it makes the oven twice as effective. "Even if we're using only one deck," says Plücker, "with the MIWE ideal e+ we achieve the same baking results as if we were using the entire group of decks or the entire oven." The temperature curve is actually a curve and not an up and down zig-zag with upward and downward temperature fluctuations. The intelligent control system is not only precise, it can even predict what to do next.

Even a non-expert could tell you that this configuration obviously requires less energy than conventional flue-gas ovens. "Energy efficiency is very important to us," says Christian Plücker. He was one of the first customers to install a MIWE eco:nova and is using one the first MIWE roll-in rack ovens with a Touch Control system. The residual heat from

these ovens and thermal oil baking ovens goes to the MIWE eco:nova heat recovery system.

A heat recovery system for the two new deck baking ovens was integrated via the MIWE eco:box exhaust gas heat exchanger. In this way, about 70 percent of the flue-gas that usually escapes up the chimney can be recovered. At the same time, Plücker saves on the cost of a separate chimney because the two flue gas lines are routed through the eco:box, where they exit through a flue.

For Christian Plücker, these are some very appealing and obviously very useful features of the oven system. But for him, ovens have one primary purpose: perfect baking. And that's where the new MIWE ideal e+ with its sophisticated burner technology already has many advantages over other systems. "You can't see any difference in the baking results," says Christian Plücker, showing two loaves of bread. This one comes from the thermal-oil tunnel oven. The other loaf was baked in the new hearth-type oven, for capacity reasons.

"So it's ideal for flexible baking," says Christian Plücker, explaining the advantage in a nutshell. MIWE engineers have almost achieved the impossible: the ability to bake on the deck plate, products with the same characteristics as those baked in a thermal-oil oven, and flexibility similar to heating gas circulators. Not to mention very easy and convenient loading and unloading thanks to an efficient loader system. If MIWE's new generation of ovens didn't already have a name, they would have to be called "ideal." →



The loader automatically fetches the bread at the transfer station.



The two MIWE ideal ovens are loaded by a MIWE athlete. Between them, the conveyor to the dispatch area.



No difference between the thermal-oil tunnel oven (loaf on the right) and the MIWE ideal e+ flue-gas baking oven (loaf on the left).



Evenly lightly browned – typical for wheat bread.

In the words of Christian Plücker:
 “The two MIWE ideal are the perfect addition to our existing oven systems. We can bake more independently, more

flexibly and also in small batches. At the same time, we’re achieving baking results that we’ve only ever seen with our thermal-oil tunnel oven.”

A brief portrait of Bäckerei Plücker

Owner: Family Plücker
 Zur Rittermühle 8
 34513 Waldeck

Branch outlets: 37 + approx. 25 percent delivery

Employees

Production: 33, of whom 3 are apprentices
 Sales: 190
 Shipping department/logistics: 10
 Administration: 4

Sample prices:

Rolls 0.27 Euro
 Mixed flour bread 750 g 2.30 Euro
 Special bread 750 g 2.65 – 2.85 Euro
 Danish-style pastries 1.05 Euro