

Eight thousand per hour

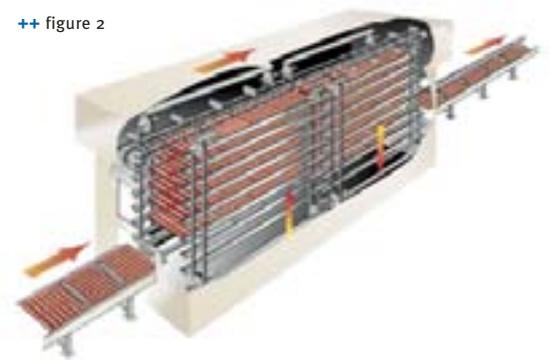
THE KAAK GROUP HAS DEVELOPED A COMPLETELY NEW BAGUETTE LINE, FROM DOUGH DIVIDER TO FREEZER FOR 8000 PIECES PER HOUR



++ figure 1

++ figure 1
Proofing system – Kaak's multi-step approach minimizes the number of chain motors and movable parts in the system and ensures quiet operation

++ figure 2
Proofing cabinet – the final proofer of the baguette line 8000



++ figure 2

It all starts with a DoughMaster by Benier. This is a compartment-type dough divider which is capable of handling dough almost stress-free and with a comparably high amount of water in the dough (see boxed item).

After the dough divider, the line splits into two parts, each of them with an hourly capacity of 4,000 pieces. The next stations are two rounders, in which the dough is given more tension for high stability and a more uniform pore pattern. Prior to being transported into the moulder the dough has approximately a 15 minute relaxing phase which promotes dough structure and flavor development.

The combination of dough dividing system and rounder allows the processing of doughs with a hydration of 60-63% instead of the commonly used 56-58%. This means that a least 4% more water can be used for the same amount of flour.

The next step is the moulding which happens in three phases. At the end, the dough strand has an exact length of 700 mm with a uniform height over the entire length. Moulder ML 1000 first stretches the dough to more than 300 mm. Phase two is a four minute relaxing period. During phase three, the so-called dynamic hands make sure that each dough piece is shaped to the precise length of 700 mm. The dough pieces are then placed on baguette sheets sized 1,600x800 mm and transported into the final proofer. This is the point where Kaak's multi-step approach starts. The multi-step proofing cabinets made by the Dutch company have fewer components and need less movement than common paternoster systems. Several sheets are gathered together before moving one step upwards or down-

It is apparent at first sight. The floor space for the equipment capable of producing 8000 frozen baguettes per hour is rather small considering the high production capacity. The reason for this is simple. This capacity shall be achieved with only one line, 70 m long and 8 m wide.

The new baguette line developed jointly by different companies within the Dutch Kaak group is not only a space-saver, but also it needs the same number of workers as baguette lines with lesser capacities: two employees, that is all.

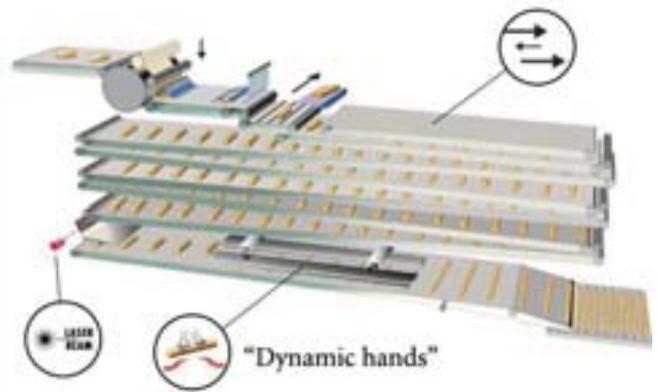
Two lines are already under construction and will probably in the foreseeable future trigger a price war on the market in Western-Europe. Not only is the price advantage exciting, the line has some intriguing technical features including low stress dough division, make-up and rounding.



++ figure 3

++ figures 3+4

ML 1100 – the dough strands are pre-cut in the moulder, the final length is achieved with so-called dynamic hands



++ figure 4

++ Dynamic hands

Pre-shaped dough strands in the moulder have a length of 400-500 mm. Seven of them are placed on a board. A moulding board from above presses them with swinging movements simulating the hand of a baker but servo-controlled to the precise length and thickness

wards. This means that within a couple of minutes there is only one controlled movement of the system, minimizing the number of chains and movable parts. The entire proofing system operates with guaranteed uniform climatic conditions because there is one sufficiently dimensioned air conditioning system with recirculation and continuous fresh air infeed which ensures constant humidity and temperature for the whole final proofing system. After the final proofer the duality of the systems ends. The baking oven awaits the dough pieces and here there are two alternatives to choose from:

- + Daub's classical multi-deck thermo-oil step oven which delivers a highly uniform baking result. It develops very little convection because of the thermo-oil heating system and there is no chimney effect due to the closed hearths. The products move horizontally through the oven. Kaak recommends this oven for par-baked goods mainly because a high amount of water is retained in the dough and the dough pieces develop an elastic crust.
- + Daub's multi-step oven is new and has an indirect gas heating system which is much more compact than the thermo-oil oven and thus can be integrated into existing lines more easily. Its technological principle fits the one of the multi-step proofer. This oven was engineered in Terborg, Kaak's headquarters, but it is built by Daub in Hamburg. The baguettes on sheets move up twice and move down twice. There is a total of four heating zones, the first two are heated by two burners with the two rear ones by only one burner. According to Aart-Jan Hartmann, sales manager of the Kaak Group, this is the perfect oven for baguettes and ciabatta: "These products require an intense and uniform heat, even in the middle of the sheets." To prevent the inevitable loss of moisture which baked goods experience in the convention oven, Kaak offers two options: spraying a fine mist of water ▶

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directly onto the products or introducing additional moisture into the first two baking chambers for controlled adjustment of the relative humidity.

No matter which oven type has been chosen, the subsequent stage is now a multi-step cooling system and/or a multi-step freezer. The latter one needs to be highlighted because it is actually designed for continuous operation. It is equipped with one more evaporator than is really needed for a proper operation. This means that alternating one evaporator can be defrosted without impairing the freezing capacity or even interrupting the freezing process.

At the end of the line, the baguettes are pushed off the sheets and transported to the packaging unit. The baguette sheets move at the side of the line – instead of underneath – back to the depositing station. They can be easily accessed in case of malfunction.

There is a buffer storage for the sheets which can accommodate one oven load, which is precisely 100 sheets. Even if the line stands still, nothing has to stay in the oven. 400 sheets are needed each hour at the depositing station after the moulder. A PLC ensures that all 400 sheets are there in time, either from the system or from the buffer storage. +++

Four special features of the DoughMaster by Benier



Firstly, all knives, pistons and peels are driven independently via servo motors and are computer-controlled, based on the respective recipe. This has the advantage that the movements during dough division are not parallel and that the dough is only pushed into the weighing compartment when the suction piston has really reached its ultimate position. In addition, the pressure of the suction piston can also be controlled depending on the recipe.

Secondly, the dough pieces are less sticky because there is only as little pressure as possible acting on the dough inside the divider and thus hardly any water escapes to the surface.

Thirdly, pistons and all other parts coming into contact with the dough are made of stainless-steel, are easily accessible and

can be detached with one flick of the wrist. The Laminex conveyor belts can also be detached via quick release fastener and removed. Knives and suction pistons, the latter ones having a weight of 20 kg, can be folded out for cleaning; the same is true for the oiling roll at the belt. This all makes cleaning the machine with water very easy. The machine is splash water-proof according to IP 56. Most surfaces are designed with a slight slope so that no water collects anywhere. The residual water simply drips into a moveable vat underneath the machine.

Fourthly, the oil consumption of the machine could be reduced by 70 % compared to other commercially available dough dividers. The minimum amount per hour needed in continuous operation is 0.3 liters.