Intelligent checkweigher

DUTCH MACHINE MANUFACTURER, BENIER IS INTRODUCING A NEW DOUGH DIVIDER IN THE FALL WHICH WILL OPTIMIZE THE DOUGH DIVISION PROCESS

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The new development of the Kaak subsidiary from s'Hertigenbosch is based on the observation that the charging volume of the divider is hardly monitored, documented, verified or even controlled. The result is: all parameters apply to all types of dough but none of them are optimal. It often happens that more dough is sucked in from the hopper than is precisely needed. This is due to the fact that otherwise the measuring chamber might not be completely filled and the discharged dough piece underweighted.
On the other hand, excess dough that is sucked in and then rejected again will suffer from this treatment. Even dough dividers claiming to work as gently as is possible such as the Dough Master cannot avoid, but only reduce this effect. However, the stress is compensated because the dough pieces have their precise weight.

The larger the amount of excess dough used for the measuring process, the larger the risk that some parts of the dough are subjected to the dividing process more than once. But this is not the only problem, according to Roger Romsom, sales manager at Benier, in s'Hertogenbosch. "The more dough is sucked in, the higher the risk that some kind of turbulences occur inside the measuring chamber which will impair the weighing preciseness." This can be reduced by optimizing the dough volume's dependence on the type of dough to be divided.
When plotting the real dough pieces' weights on a graph, a Gaussian distribution will be obtained. The more deviations from the weight, the broader the normal curve of distribution will be. The more precise the weights are, the narrower the curve is. Romson explains: "Our control system checks via checkweigher the actual weight of the dough pieces dis-

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charged from the divider. Based on the distribution of weights, the optimum suction volume is calculated for the dough just being processed and the Dough Master controlled accordingly. The end result is a narrower curve of distribution, higher weight preciseness and less stress on the dough.

The Dough Master is the industrial chamber divider by Benier, which will even handle dough with a hydration of more than 85% and with five hours batch proofing. The Dough Master is available for weights of up to 6,500 g and capacities of more than 10,000 dough pieces per hour or 167 cycles per minute. Romsom stresses that the Dough Master does not only handle very soft dough but also all other types of dough from pure rye, rye mix, ciabatta and panetoni to pure wheat dough.

The Dough Master is complemented by a long moulder which Benier introduced at iba 2006. According to Romsom, this moulder is as gentle to the dough as dough band equipment and as precise as traditional bread making equipment. The new long moulder is designed for an hourly capacity of 3,000 pieces. Two long moulders can be supplied by one Dough Master, thus achieving a line performance of 6,000 pieces per hour.

When the dough pieces, coming from the dough divider are placed in front of the long moulder, the orientation of the gluten strands inside the dough is already pointing in the right direction because they are positioned at right angles to the belt and aligned to the middle. The next station is the common roller-rolling net combination which can be turned off, as well as a stationary pressure board as an optional station. The roller head is also newly designed. It rolls out the dough directly onto the belt instead of against a second roller. However, innovative core parts of the line are the new pressure boards that can move along with the belt. While doing so, the pressure boards move gently back and forth so that time and intensity of the movement can be adjusted.

The board has a specific shape depending on the product to be processed. A slightly bent board for example ensures that the baguettes will have pointed ends.

The pressure to be applied during moulding is adjustable as are duration and intensity of the movement required to bring the dough into the correct dimension. Romson explains: “Most important is the combination of preciseness and gentle processing closely followed by the consideration of introducing much tension into the dough and to producing no waste.”

Compared to the stationary pressure board with a moulding path of 1.5 m, the new board is double this length, totaling 3 m. Of course, the new plant is also suitable for the processing of firmer dough. Via recipe control, the weighing parameters, as well as the moulding parameters, are correspondingly adjusted. +++

++ figure 1
Dough Master

++ figure 2
Checkweigher Dough Controller