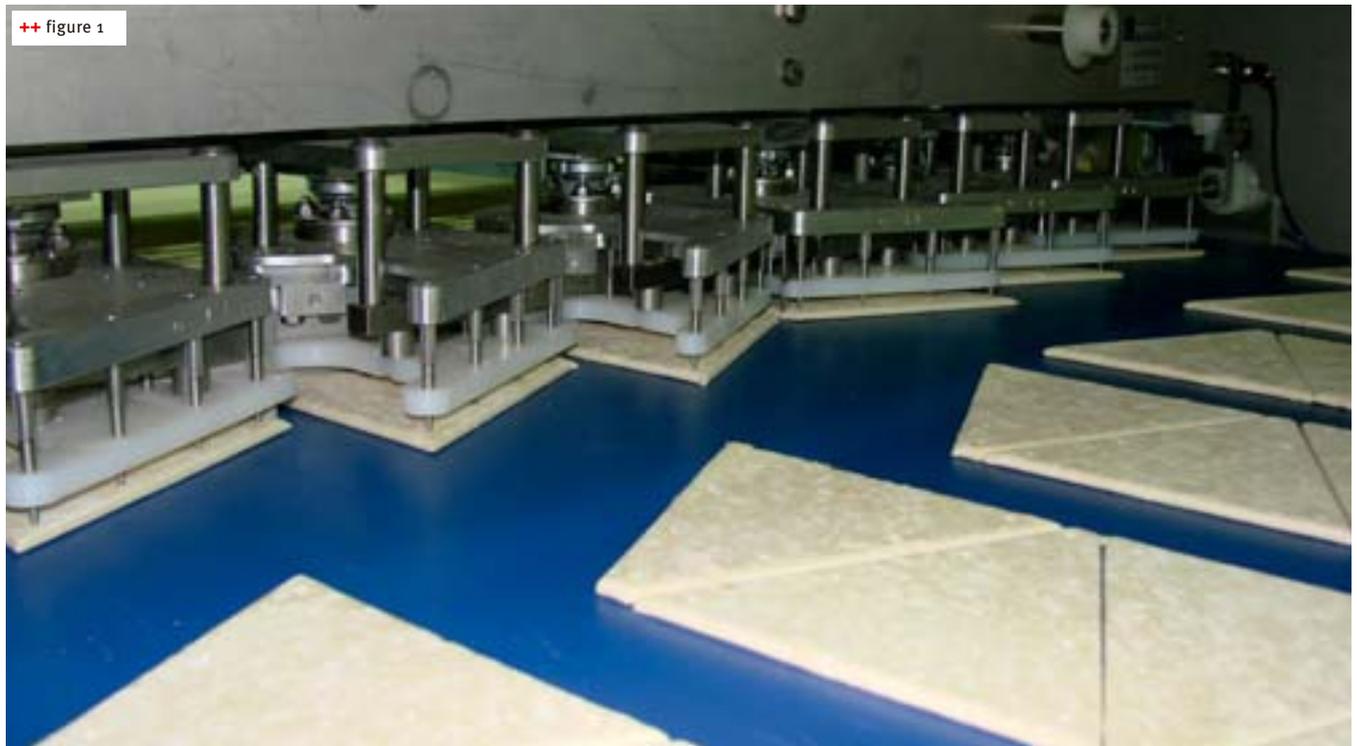


The seam in the right position

TWO INNOVATIVE FEATURES FOR LAMINATING EQUIPMENT WERE DEVELOPED BY FRITSCH GMBH, MARKT EINERSHEIM, GERMANY, AND IMPLEMENTED INTO AN INDUSTRIAL LINE FOR A CUSTOMER IN FRANCE. BEFORE DELIVERY, THE EDITORS OF BAKING+BISCUIT INTERNATIONAL HAD THE OPPORTUNITY TO TAKE A LOOK AT THE EQUIPMENT AND TO SEE THE INNOVATIONS THAT THE MACHINE DESIGNERS HAD IMPLEMENTED IN ACTION



++ figure 1

++ figure 1
At the first stage of the punching and turning system, the dough pieces are punched out and then separated across the belt in six rows

++ figure 2
After separating the dough pieces in a longitudinal direction as well, tools turn the individual triangles into the right direction for coiling

+ The first innovation of the laminating line for coiled products such as croissants and crescent rolls is a further development of the STR (punching and turning system) which is still divided into two steps in the new equipment. However, the individual processing sections are arranged differently in order to boost the hourly output of the machine.

First of all, the laminated dough is cut lengthwise into strips and trimmed. After this, the dough sheet passes the first STR module which punches out the triangles. Tools with needles are used to separate the triangles from each other and to form six rows across the 1,200 mm wide, blue plastic conveying belt. The separation of the triangles in a longitudinal direction and the turning of the dough pieces take place in the second STR module. Here again, tools equipped with needles handle the dough triangles and align them accordingly so that the separated dough pieces are now arranged for easy coiling. The separation of the individual processing steps of punch-

ing and turning allows for the hourly production of e.g. up to 60,000 miniature croissants with a weight of 25 g or 72,000 micro croissants with a weight of 15 g on the new line.

Second innovation

After the dough pieces have been coiled up, they are transported to the next innovation feature which is located at the end of the laminating line. The French customer requested that the seam position of the croissants could be controlled for improved quality assurance. For the first time, Fritsch employed a camera system instead of point measurements for

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++ figure 2



control purposes on the new line and these on-line cameras continuously monitor the dough pieces with one camera being responsible for two dough pieces each. During production, the cameras detect a certain part of the coiled dough pieces which runs underneath the lenses and the unbaked croissants are illuminated by a strong red light which displays a picture with improved contrast. In this way, the position of the dough piece can be recognized more easily. The dough pieces stop underneath the cameras and are turned by

a special device until the correct positioning of the seam is achieved. This allows for the alignment of the seam of the dough piece depending on further requirements. As to whether the seam points upwards or downwards is merely a matter of machine setting and control. After the camera has recognized the right position of the seam, the turning of the dough piece is stopped so that the dough pieces can be transported for further processing while remaining in the correct position with regard to their seam position. For the SLC ▶

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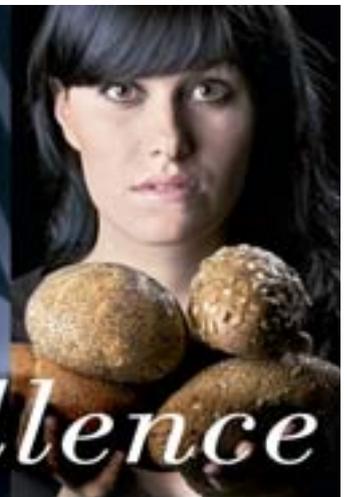
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system (seam position control system), Fritsch guarantees a position preciseness of ± 15 degree. The processing speed is about 70 cycles/minute. The line speed is only limited by the performance of the camera software. Efforts towards further increase in performance are already in the pipeline. With this equipment, the detection is much more precise than with other systems and, according to the company, the error rate is less than 5%.

Additional options

Fritsch also offers the optional feature of rejecting non-conforming products automatically. Additionally, the croissants

may be realigned after the seam positioning, as for example, if the dough pieces need to be deposited automatically onto baking trays. This feature is not required at the French industrial bakery because here, the croissants are dispatched immediately into a freezer.

The last business year has been very successful for Fritsch. The company realized a turnover of EUR 68.9m. This in an increase in sales volume of more than 26% compared to the previous year. According to the company, foreign orders had a share of 73%. The machine manufacturer is present in more than 40 countries via subsidiaries, branches and sales offices. +++

++ figure 3
The camera recognizes the correct position of the seam

++ figure 4
Finally, the croissants are arranged in the required position. The error rate is below 5%



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