

# Multiple Choices

AT FIRST GLANCE, THE IMPRESSIVE FEATURE OF THE NEW STUYVER'S PRODUCTION PLANT IN LANGLEY, BRITISH COLUMBIA, CANADA, IS ITS WEALTH OF VARIATION. ON CLOSER INSPECTION IT TURNS OUT TO BE A MODEL FOR THE FUTURE THAT ALLOWS CONSISTENT QUALITY, EFFICIENCY AND FLEXIBILITY TO BE LINKED TOGETHER



++ figure 1

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++ figure 1

The Benier bread make-up with a dough divider, a round moulder before and one after the pre-proofing cabinet and a long moulder to the left of the pre-proofing cabinet

**+** Being present at the commissioning of an entirely new production plant is exciting because this kind of event rarely occurs nowadays, and the insights it provides are more detailed than during any subsequent full load operation. The new production plant of the Canadian bakery Stuyver's Bakestudio in Langley, situated to the south-east of Vancouver is even more fascinating because it marks the start of a new company concept running parallel with a new production concept.

Stuyver's Bakestudio began in 1985 as a small artisan bakery and was taken over in 1997 by Aziz Dossa, who expanded it so that it is now a renowned supplier of high quality artisan bread and bread roll specialities for restaurants, hotels, food service chains and the trade in Greater Vancouver. The area of the bakery in the Vancouver suburb of Burnaby where Dossa and his German master baker Reinhold Paulus manufactured until the end of April was nearly 2,800 m<sup>2</sup>. Their most important trump card: the quality of the products and perfect service, fulfilling (almost) every customer's wishes. Their biggest problem: a wide variety of similar products, some of them in very small batches, a large amount of manual

work, which caused quality fluctuations and rejects, and extremely burdensome organization and stress for the owner and the head of production. On top of that, Aziz Dossa was contemplating retirement and there was no successor in sight. The solution came in the shape of Premium Brands Holding, a stock exchange listed investor who makes targeted purchases of medium-sized businesses in the food industry in Canada and the USA, integrates them into a network with a long-term plan, and invests in their expansion.

Dossa, who remains with the company in the role of President, and Ron Kleijn, President of the bakery division of Premium Brands, developed together with the Kaak Group from Terborg, the Netherlands, the concept for a new production facility designed to enable the old virtues to be retained, the old problems to be eliminated, and opportunities for expansion to be created. The outcome is a complex production structure in a leased building in Langley, at the gates of the City of Vancouver, directly on the highway leading to the east of Canada, and just under 8 km from the border with the USA. The plant which is now coming into regular operation can produce practically any kind of bread, irrespective of whether



++ figure 2

The Daub double-decker oven with a hinged steel belt at the bottom and a wire belt at the top. In the background is one of the two cooling towers

it is baked in a pan or hearth-baked, and any type of bread roll, regardless of whether it is round moulded or cut from a dough sheet, as well as ciabatta and baguettes. Every product can run in large or small batches, each with its own recipe, with and without poolish or sourdough, with different proofing times and different baking times, sliced or unsliced, fresh or frozen.

Basically the plant consists of a dough production unit including poolish and sourdough tanks, three different make-up lines with the additional facility of being able to vary the products by hand, two flexible proofing cabinets, a thermo-oil tunnel oven with two decks equipped with different belts, two spiral coolers, a spiral freezer, slicing and packing stations together with the required conveyors, and a pan and tray storage unit. In addition, there are the usual accessories such as suction depanners, seeding and greasing units, peel-board brushes, water sprayers, tray cleaning stations etc. The decisive feature is that practically all the individual production stations can be combined together or networked, or can run in parallel, thus providing a large selection of production processes and production volumes without needing to accept quality compromises at any point. From the production technology point of view, the diversity and level of quality of the "old" production plant is retained, but the processes are automated, consistent, reliably traceable and distinctly more profitable. The new production facility also ensures considerable reserves of capacity for the planned expansion. The maximum production volume in the old production plant in Burnaby was 17 t, here in the new Langley plant the capacities are 22 t per 8-hour shift.

The backbone of the production operation consists of three circuits for pans and trays working in parallel, which receive doughs arriving from the make-up plants. Circuit A accepts

bread doughs deposited in pans as well as small baked goods and ciabatta on trays, and transports them through one of the proofing cabinets to the upper deck of the oven, which is fitted with a wire mesh belt. Circuit B conveys hearth-baked loaves on peelboards to the proofing cabinet and then via a scawler to the lower deck of the oven, which is fitted with a hinged steel belt, or alternatively small baked goods on trays or baguettes in moulded trays. Dough pieces proofed in baskets are also carried through the proofing cabinet with the baskets on peelboards, and are deposited by hand just before the oven and reach the hinged plates via scrapers. Circuit C runs semi-automatically and firstly it ensures that focaccia slabs (large rectangular flat-breads) and subs (soft elongated American buns) on baking trays move from the dough sheet plant towards the trolley proofing cabinet and artisan oven, and small amounts of frozen doughs on racks go into the freezer. Secondly, hand-finished products also run on this circuit. ▶

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++ figure 3

A DrieM line produces the dough sheets for square bread rolls, ciabatta etc.



++ figure 4

The König IndustrieRex delivers round-moulded bread rolls

The circuits are supplied by three make-up plants, of which two each can simultaneously feed into Circuits A and B, while the third make-up plant feeds into the semi-automatic circuit C, which provides a time buffer that is used when necessary to process mostly small-batch products manually and/or for research and development of new products. Just less than half of all the product variants are produced on the DrieM dough sheet plants, although these account for “only” 15% of the total production volume. It can deposit onto trays in circuit A, onto peelboards in circuit B and onto peelboards or trays in circuit C. All three circuits pass their correspondingly wide deposition station in parallel. The Kaak group corporate combines dough sheet plant processes, that is mainly doughs that have been allowed a long bowl rest in the mixing bowl or even an initial bulk fermentation in a large square plastic trough. The dough arrives at the plant via a dough hopper. Two star rollers at the lower end of the hopper each portion pieces around 1 m long onto a flour-dusted conveyor belt, where they are also flour-dusted from above. The actual dough shaping is carried out by the patented “DrieMer” with a total of three pairs of rollers arranged one above the other. The top four rollers have equal thicknesses and the lower two have a smaller diameter. The middle pair of rollers can be repositioned to the right and left to reduce the speed of the dough sheet like bends in the road. The upper roller gap is fixed, but this parameter can be varied on two

lower pairs of rollers, as can the movement speed of each individual roller. Two built-in laser stations continuously measure the thickness of the dough sheet at different points in the system, and regulate the various control parameters of the Dough DrieMer so as to produce a dough sheet with maximum uniformity. The reduction of the dough sheet thickness is then carried out by a satellite roller unit called a Multiroller, which like the cross-pinner roller and calibration roller assembly is mounted on a stainless steel frame. The Multiroller’s twelve rollers run against a curved rail instead of against a lower roller. The curve radius is large, thus ensuring that a large-area contact is formed and the dough sheet is reduced uniformly over an extended path. At the end of the curved lower rail the dough runs onto the next conveyor belt without a drop, thus excluding any pulling on the dough. The cross-pinner roller is also positioned below the conveyor belt. Its knobby surface simulates the movement of hands with spread-out fingers that gently draw the dough outwards. Thus the height of the top roller determines the width of the stretched dough.

Next the dough is cut into strips which are shortened to the required product length by a synchronously moving guillotine, or a punch is used to stamp the required shape out of the dough sheet. Baguettes are also produced on the DrieM line. Depending on the variety, they are punched out (narrow side forwards) or long-moulded (products crosswise). A five-row



++ figure 5

The tandem arrangement consisting of a sourdough and poolish tank together with an ice-maker, a pre-chilled filtered water system, yeast dissolver, silos, big-bag station and weighing unit are all part of hb-Technik's ingredient handling system



++ figure 6

Suction nozzles above the belts clean the peelboards and loaf pans after each cycle, after which they are either sprinkled with corn (maize) semolina in the stack storage area on the upper floor or are returned for re-use. Dust separators collect the residues



**++ figure 7**  
The round dough pieces are being given "ears", which turns them into "Portuguese"



**++ figure 8**  
The first loaves emerge from the Daub Automatic Hanseat

IndustrieRex from the König Maschinen Gesellschaft m.b.H. Company, Graz, Austria, supplies round-moulded dough pieces for crusty Kaiser rolls, soft buns and twenty other kinds of small baked goods, which together represent around 25% of the production volume. After passing through the pre-proofing cabinet and if necessary the stamping unit, the dough pieces each weighing from 20 to 140 g are fully automatically deposited onto peelboards or trays. Here again manual alteration is possible (see photo of Portuguese bread rolls), and the number of rows can be limited to 3 or 4 rows if necessary. The maximum capacity is 15,000 rolls/h.

No. 3 in the team is a Benier bread work-up line starting with a Dough-Master dough divider. At a maximum stroke rate of 1,500 strokes/h, it portions doughs into pieces weighing from 100 to 1450 g, depending on whether processing is taking place in three or six rows. The following round moulder deals with up to 4,500 dough pieces/h, the quality of moulding deteriorating beyond the weight limit of 1,200 g. It is followed by the pre-proofing cabinet with proofing cups for a maximum loading of 336 dough pieces; this provides ultraviolet irradiation of the proofing swings to disinfect the nylon hangers. For hearth-baked round loaves, the pre-proofing cabinet can ▶

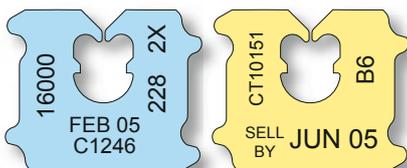
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### BAG CLOSURES

### BAG CLOSING EQUIPMENT





++ figure 9

Three specialised make-up units side by side (l. to r.: Benier bread plant, König IndustrieRex bread roll plant, DrieM dough sheet plant) ensure the finest product quality while still allowing maximum flexibility. All the plants stand on feet at least 10 cm high to enable the area below them to be cleaned as well

output to a second round moulder before the dough pieces are deposited onto peelboards by hand. A presser-board long moulder is available for long-moulded products. Pans, baking trays and peelboards on circuit A and B are filled automatically after the long moulder.

The final proofing of all the products is carried out by two Multi-Block final proofers, each consisting of three blocks in which the proofing carriers run upwards once and then downwards again. There is space for a maximum of 720 proofing carriers simultaneously in all 3 blocks. However, it is also possible to skip over one, two or all three blocks via bypasses, which allows producing dough pieces with different proofing times. The speed of the upward and downward movements of the individual blocklets can be regulated differently, here again allowing the needs of the individual products to be accommodated in spite of the automation. Products with different proofing times can proof in parallel, provided they are fed in with a time that is offset sufficiently to ensure that they do not run in the same block at the same time. All the products are baked by a Daub Automatic Hanseat with a total baking surface area of 108 m<sup>2</sup> and a hearth width of 3,100 mm. The lower deck is fitted with a hinged steel belt and the upper one with a wire mesh belt. Both decks have steaming zones with external steam supplies, and also a horizontal turbo system. A vertical turbo system can also be brought into use in the hearth with the wire mesh belt. Basically all the products are fully baked, irrespective of whether they are to be delivered fresh or frozen. The ratio of fresh to frozen in Burnaby was 70:30. Here in Langley the proportion of goods delivered frozen is expected to increase markedly, firstly because corresponding new client groups have already been

obtained, and secondly because the delivery area is being enlarged. After leaving the oven, the products move into the first spiral cooling tower and if necessary through the second one as well. The products destined for freezing are diverted into the spiral freezer in a separate room. Belt washers on all the cooling systems ensure that they cannot be contaminated with residues during the cooling-down phase.

The planning of the new Stuyver's production facility in Langley started before 2009 and was a difficult process, into which new ideas and concepts were introduced again and again. Construction finally began 6 months ago, and after a 6-week test run, completion of the move is planned for the end of May 2012. A technical challenge is not the only thing the 25 employees who are accompanying the move to Langley must cope with. This is why Ron Kleijn has developed an intensive training program designed to lead them up to the new production operation both technically and mentally. In the context of this program, two persons at a time almost take on the ownership of a defined part of the production technology, for example, the DrieM or the König plant. They are specifically trained for this and undertake responsibility for its functioning, and if necessary they even decide what is done to rectify faults. Kleijn says: "In this way each is a specialist and is his or her own quality controller. This is the only way to safeguard quality while at the same time working in the most automated and profitable way that is possible." The system is supplemented by a second program in which Kaak trains Stuyver's own mechanics, together with a newly-appointed "Automation-Manager", an IT specialist whose job is to ensure that the controllers can be adapted and optimised to the respective requirements. +++



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