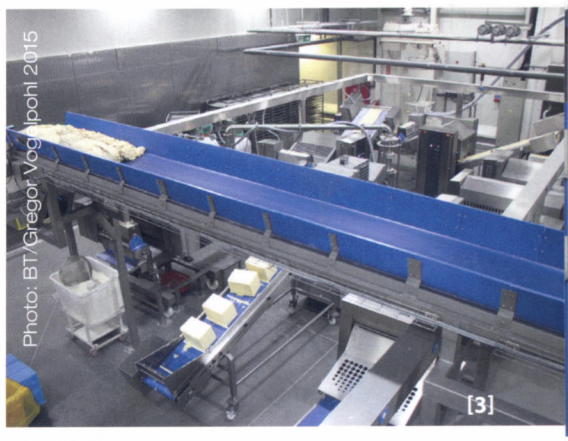
Team of specialists

On the basis of their special knowledge, Wojciech Smiechowski and Peter Mitsch and their employees have established Inter Europol as a successful supplier of baked goods.

The new building, put up by Inter Europol in Malopole, meets all expectations that are set in an industrial production of baked goods. On a line of 420 metres, the enterprise is producing deep-frozen baked goods for the Polish and the European market. Line production could be implemented in perfection. Mainly the Chief Production Officer, Peter Mitsch was responsible for planning and he was actively supported by Project Manager Rüdiger Stollmeier. The ambitious project could be implemented within the shortest time. Currently, three lines are running and two further lines are being installed. By the way, this happens earlier than planned. „The utilization rate of our new factory has exceeded our planned expectations and therefore, we have decided to antedate the planned extension. Originally, we wanted to negotiate about the two further lines at the iba in Munich," Stollmeier explained during a factory tour. Many of the plant builders, who have already worked in the first factory, also got another chance in Malopole. „ Our production methods applied on the technical plants and provided by the machine builders from Marki have proved to be successful and we did not see any reason to make changes here. Therefore, we relied on the proven technology. However, Malopole certainly is not a copy of our first factory. If only referred to space, we had, of course, fully different possibilities that we utilized extensively," Mitsch explained in a first statement. Therefore, in addition to the main building, which, among others, accommodates five lines for the production of small baked goods and bread, another clearly smaller complex was built in which also small baked goods and fine pastry is produced on four Fritsch lines. „In this building, the advantages of our working methods come into their own. Already in the old building we

Photo: BT/Gregor Vogelpohl 2015

For raw material handling and starter dough technology in the new production in Malopole, Inter Europol also relies on the individual solutions provided by Daxner.



[1] Yeast is solved, cooled and exactly dosed into the dough mixing unit for the wheat starter dough. [2] The components of the wheat starter dough are continuously added into the dough preparation unit and conveyed to the mixing screw via the connections. Then, the mixing screw generates a homogeneous mass. [3] The seeds and the grains are compiled for the yeast-free sponge and added into the tank via the two sack emptying machines.

were able to produce small batches as well as large quantities for an acceptable price because we could use our plant configurations. That means, 600 kilograms of dough in one hour are possible for us; however we can also process up to 3.5 t of dough per hour with our most powerful lines," the Chief Production Officer explains the advantages of the working principles in the production from his point of view. This is the way to fulfil the customers' individual requirements and the introduction of new products in the market can be tested on smaller plants at first, before then – if the baked goods become successful, the production is changed to the more powerful lines. In the following, we want to introduce individual line components of the new production in Malopole.

Raw materials/ Weighing

Daxner International is responsible for the above mentioned area in the new factory. A partner who has already been considered in Marki, as already mentioned. An important part of the Polish manufacturer's offers is its statement that it consequently uses rye sour dough and wheat starter dough in the production of bread and small baked goods. This is a quality characteristic with which they got points already in the old factory. There, Inter Europol is processing approx. 30 tons of rye sour dough and 45 tons of wheat starter dough per day in three shift operation. We would like to start the factory tour in Malepole where the raw material flour is received. Five silos with a capacity of 50 tons each are ready for reception, take over the flour and store it. Already in this position, the company uses all technical possibilities to ensure a smooth production process. For this reason, they decided to use their own blower station that empties the tank trucks. Here, the conveying air is not only dried but simultaneously it is cooled. This has the effect that the formation of condensate in the silos is avoided. By the way, the five silos are housed. This is due to the fact that, in Poland, extreme temperature fluctuations referred to the year or the day can occur. The other raw materials are stored in big pallet stores for further processing. The raw material suppliers are well-known, internationally working companies, where the quality of the raw materials is tested and assessed in laboratories. „We place very high value on the quality of our raw materials. This is the basis to produce good products. Therefore, reliable partners are very important to us," Stollmeier declares. There is a direct connection between the big silos and the intermediate flour silo that supplies the two dosing stations. Another connection exists to the department of swelling and fermentation technology. The required quantities of rye sour dough and wheat starter dough are produced here.

Technology Daxner

- Five silos à 50 tons
- Suction conveyor system
- Sourdough system
- Starter dough system
- Sponge dough system
- Table for small components
- Brine

Sour dough

The one-step sour dough is produced in a classic way. At first, the necessary amount of flour or coarse meal is weighed and after that, it is filled in the mixer via a

[4] The Laminator 300 made by Fritsch is suitable for bakeries which want to process between 200 and 1,000 kilograms of dough – if blocks are produced, also up to 1,500 kilograms will be possible. [5] A guillotine cuts the individual blocks; they are then automatically placed onto the baking plates.

direct connection. There is also a separate line installed for the water required. Also the tanks, in which the starter culture is produced and stored separately, are connected with the mixer. After all components have been provided, the paddle will start moving and mix the individual ingredients thoroughly to obtain a homogeneous mass. After that, the sour dough is pumped into one of the four free tanks which have a capacity of 3,000 litres each. Certainly, the fermentation containers are equipped with an paddle as well, to be able to move the (fermenting) sour dough in intervals and in this way, the so-called formation of clumps during the souring process will be prevented. The sourdough is then transported by sorts via a further separate line to the dosing supply unit. There, small tanks have been installed again with a capacity of max. 1,000 litres from which the sour dough and also the liquid component can be ordered by the dosing station. This measure accelerates the weighing process because the individual ingredients are not required to be conveyed via long pipe lines. Furthermore, it is helpful for the speed and the accuracy of the weighing procedure that all components can be dosed individually and in parallel via a flowmeter. If the specified filling level in the tanks, measured by the load cells, is undershot, it will be refilled automatically from the larger storage containers.

Wheat starter dough

Two scales, switched together in series, first provide for the flour supply to the dough mixing unit in batches. While the top scale weighs the required amount, the lower scale can simultaneously supply the dough mixer. The liquid components of the wheat starter dough are continuously added into the dough mixing unit and then conveyed through the connections to the mixing screw which produces a homogeneous mass. Through a system of pumps and pipes, the wheat starter dough gets then into one of the four 5,000 litre-maturation tanks. After the maturation time in the tanks, the system pumps the wheat starter dough into the storage container with the capacity of 6,000 litres. In this path, a plate heat exchanger is installed that cools down the wheat starter dough by more than 20 °C to achieve the desired storage temperature. The whole system is controlled by time and temperature and it can be operated and controlled via a control unit which is directly installed on the plant or via a computer in the production office. For sour dough as well as for wheat starter dough, cleaning is very important to prevent bad fermentation. The tanks are cleaned by applying an automatic cleaning program and a cleaning pig is used for the pipelines. Residues are led via the corresponding pipes into the drains provided.

Other components

Inter Europol is working with grain soak. Complete items of seeds and grains are compiled in the raw material stock and then filled into one of the three swelling containers via sack emptying machines. The seeds are wet sifted using water so that the mass remains pumpable. Finally, all ingredients get to the two dosing stations that supply the lines with dough. In this area, a desk for small components has been installed for weighing of the manually added ingredients, for instance pressed fresh yeast that still has to be added to the dough. „We consciously decided for batch kneading. Here, we can very well monitor the development of the individual doughs stored in mova-

[6] On further Fritsch lines, the blocks are further processed – here the production of cherry-vanilla-puff pastry is shown. [7] At first the dough portioner ensures the uniformity; it gently and equally cuts the dough in portions using a stern roller without oil. [8] At first, the dough band is separated in bands and then, cut in suitable squares using a guillotine.

ble plastic tubs. This is very important, especially against the background of long dough rest times," as Mitch says. Monitoring is also a good keyword for the control system of the complete production. Mitch can overview all parameters of the production in Marki as well as in the new production in Malopole from his office in real time. And this is not only possible from his office – his mobile phone provides it too.

Preparation

For preparation, Inter Europol relies very strongly to the machine builder Fritsch from Markt Einersheim. „We generate a great portion of our growth with artisan products that are classified in the higher-price segment," Mitsch comments on the success story of the enterprise. He adds: „Even with the long dough rest times, we need the suitable lines that can process very soft and pre fermented dough." Therefore, Mitsch and Stollmeier decided in favour of Fritsch also in the new factory and produce artisan with the production line Impressa Bread in an effective and efficient way. A very successful product is here, among others, Ciabatta that has an enormous growth potential in Poland and overall in Europe. To be able to process the soft and natural dough, Fritsch offers

The loader with open conveyor belt will be driven by chains and chain wheels. It takes the products from the peel boards and then, it puts them into the stone tunnel oven.

the Soft Processing method as a solution. In accordance with the manufacturer's specifications, this solution does not only include the gentle production of the dough band but also the soft handling of the dough through the whole process chain. First, the dough portioner ensures uniformity after the dough was tipped out of the plastic container via the elevator tipper into the hopper and forms dough portions in a gentle and equal way using a star roll without oil. After that, the dough sheeter with its patented five-roll shaping system is used. Its coated rolls with especially shaped strippers gently form a homogeneous dough band of the soft dough. The core of the Soft Processing technology is the Fritsch satellite head with its patented, dough-repellent, coated rolls. It makes dough sheets of the desired thickness in a fast and especially gentle way. Other components support the careful dough handling. For example, here the flush dough transfer with rolling knife edges can be mentioned that happens without disturbing tensile and compressive strength. Furthermore, the moving guillotines are important for the gentle process because they prevent any unnecessary compression and stretching of the dough and can also safely and powerful divide doughs that include coarse ingredients. In this way, unnecessary tensions and compactions in the dough are mainly avoided in each phase of the process. „Due to the gentle processing, the dough keeps its structure that we intended to obtain through our conscious dough guidance which is the precondition for the desired product quality," Mitsch comments on the production methods. This is the reason why – also for a large number of pieces and high degree of automation – individually created baked goods of high-quality are produced that can successfully be marketed to the customers. „In our factory in Marki, we already have been using the Fritsch lines for several years. They mainly convinced us with their homogeneous product quality that we obtain also after many years of continuous use," Stollmeier explains their experience with the plant builder. The availability of the plants in 24/7 continuous operation is the plant builder's special objective. For this reason, already during the design phase of the Impressa bread, great importance was attached to helpful detailed solutions and mechanical precision of the line. That means, dough transfer positions are controlled automatically or an interrupted process is restarted by pressing a button and controlled by a program. In addition to it, Fritsch uses first-class materials and components in its plants. This includes the use of maintenance-free motors, precise and flexible sensors, as well as the use of robust stainless-steel components. In the Impressa bread line, also good hygienic conditions are ensured. Especially shaped and coated conveyors, strippers and brushes provide for cleanliness in the plant not only when soft doughs are processed. This does not only reduce the application of separating agents but reduces the overall costs for cleaning. These are costs that are also considered by the Fritsch designers. When developing the Impressa bread line, they did not only pay their attention to an easy cleaning process of the plant but they kept in mind that the employees must clean it as rarely as possible because pollution is avoided. The flour shaker controlled by the dough-band contributes its share to it. You can dose so accurately that excessive flour residues that must be removed with high effort will be avoided from the beginning. That does not only prove advantageous for hygiene and costs but it proves itself in the running process by product quality. Special materials and abrasion-proof coatings used in the conveyor, hoppers, rolls and all other guiding units with direct contact to the dough prevent the dough or the flour residues from sticking. For cleaning, all parts of the plant are readily accessible and can be cleaned easily. Smooth surfaces, large, wide open protective hoods,

Technology Fritsch

Laminator 300:
- Dough sheeter
- Satellites
- Transversal twin roll
- Calibrating unit
- Grease pump
- Return stations
- Guillotine
- Automatic placement

Impressa Bread:
- Dough sheeter
- Satellites
- Longitudinal cutter
- Guillotine
- Winding station
- Automatic placement

readily accessible frames and supports made of round tubes – all these things simplify the cleaning process and provide for fast availability of the plant.

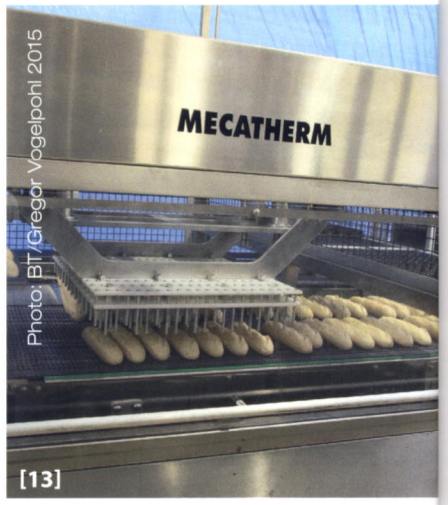
Laminating

Next to the big, 420 m long production building in Malopole, a smaller production area has been built up in which fine pastry is produced in addition to small baked goods. Blocks of Danish pastry and puff pastry form the basis of many products with up to 144 grease layers and a thickness of the final dough of 20 mm. They are manufactured on the Laminator 300. At first, the dough is kneaded in a Diosna kneader with bottom discharge and transported via conveyor belts to the hopper of the dough sheeter. Here, a continuous dough band is produced and then immediately coated with butter from a grease pump. Driven folding belts place the dough band over the grease layer and, in a first step, the created sandwich is rolled using the satellite head in accordance with the Soft Processing principle. Depending on the specified U-shape of the plant, two folding stations follow which form the desired layers. A further satellite head follows each folding station that provides for the right dimensions of the dough in an effective, but gentle way. After that, a guillotine cuts the individual blocks; they are then automatically placed onto the baking plates. The Laminator 300 made by Fritsch is suitable for bakeries which want to process between 200 and 1,000 kilograms of dough – if blocks are produced, also up to 1,500 kilograms will be possible. With a net width of the dough band of 600 millimetres and a conveyor belt speed of six metres per minute, it is the perfect starting condition in the automated dough production. The fast product change to one of the customer-specific recipes is supported by short refitting times. In addition to it, the whole plant or individual sections can be operated very easily via the touch screen panel – also in one-man-operation. Also the Laminator 300 is designed for easy cleaning of the plant. Coated surfaces, cleanly working strippers, hygiene-friendly stainless-steel design and removable flour tanks facilitate the personnel's work. The laminated dough is then pushed into the cooling unit to destress. It is not required to cover the dough blocks because the air flow speed in the cold room is just very low and in this way, the skin building on the dough is avoided.

[9] With its higher-priced artisan concept, Inter Europol is very successful in Europa. [10] The small baked goods produced on the König plant are then further processed in the plants of the Mecatherm Group.

Ciabatta Line

After the processing, for the production of semi-baked Ciabatta, Inter Europol relies to the competency of Mecatherm that promises an hourly quantity of up to 40,000 products. Among others, the French plant builder supplies the automatic conveyor system for the peel boards. The boards developed by Mecatherm with the dimensions of 1,200 x 1,200 millimetres are made of structured plastics and are 21 millimetres thick. All four corners of the boards are flattened. The conveyor system on which the boards are running consists of stainless-steel sections with guide rails of stainless steel on sides. Peel board is transported on flat plastic belts. The starting and further running belts are synchronized to each other to ensure a continuous transfer without shocks. At the end of the Fritsch line, the boards are covered with different numbers of dough pieces depending on the product and then, they run into the MVS proofer with a total capacity of 364 peel boards. The module of the MVS transfer mechanism consists of a rising and a descending stack. The two stacks are operated simultaneously by a single motor. The module can run in a pre-defined cycle mode or with a specified filling rate. It is also possible to pass through when a stopper has been set or the intake and outlet height is the same. The modules are integrated in an insulated housing. Here, at first, the dough pieces go through the proofing zone before they get to the cooling zone where they are conditioned to have a more accurate cut. After the proofing room, the proofing carrier is correctly positioned on a rotating plate and



[11] After each step, the knives are dipped into the water bath and cleaned there. [12] Overall, the baguette oven made by Mecatherm consists of four modules, each of them with a capacity of 28 baking plates. [13] The baguettes are drawn off the plates using „fingers" and placed on a conveyor belt.

then, an employee applies the corresponding decorative cuts to the product. Before it goes into the oven, a grabber takes the products off the three adjacent peel boards and transfers them directly onto the stone plates of the oven. The drive of the carriage with frequency converter allows the horizontal movement during the grabber and the oven loading procedure. In addition, there is a vertical lifting movement of the grabber wing to allow the transport and the feeding of the boards simultaneously to the loading procedure of the oven. The core of the line is the gas-driven FTP stone-plate oven made by Mecatherm with a backing surface of more than 110 square metres. The tunnel oven is designed for continuous baking on stones and consists of ten modules mounted on a welded frame. The cyclotherm oven transfers heat to the products by contact heat via the pre-heated stones and radiant heat via the heating elements for top heat in the baking chamber. For this purpose, all in all, four burner chambers have been installed in the 32 m long oven with an effective width of 3.60 m. There are two burner chambers for heating up the baking chambers of the oven modules and two chambers for the granite stones that are heated up by an independent heating circuit in their return path. At first, the products are placed onto the stones in the steam zone. In the infeed and in the outlet area, these stone are never outside the oven. Therefore, Mecatherm achieves an optimum interaction of contact heat and continuous steam under controlled conditions and provides for an improved baking result. The steam zone is separated by a Teflon curtain which height is adjustable and therefore, it can be adapted to the height of the different products. A water flow-rate meter determines the exact quantity of low pressure steam and adapts it to the specified setpoint value. The electrically controlled lock valve installed downstream regulates the occurring deviations. The steam zone is equipped with its own steam outlet and has its own curtain. The steam is withdrawn through holes in the side that are connected with a box made of stainless steel. This box is equipped with a condensate-steam system. In several positions, the top heat can be regulated via slide valves that have been mounted on the external wall and are easily accessible. At the end of the oven the products were transferred to an belt that conveys the products to the connected cooling coil. This line is completed by a buffer for the peel boards that has a capacity of 240 units. Among others, it is used when different cycle times have to be adapted for product changes. Another stone tunnel oven with a length of 40 metres was supplied by Mecatherm and is installed after the so-called combined high-performance roll line made by the company König which consists of the 10-row head machine Industrie Rex with a capacity of up to 30,000 Kaiser or cut rolls per hour. The plant includes an oven-wide after-proofer with integrated seeding plant and a transfer unit to the oven which has an effective width of 2.40 metres.

Baguette line

After the preparation for which, as it is the same for all other baguette plants at Inter Europol, WP Haton is responsible, fermentation and baking in the baguette line is also

provided by Mecatherm. The line is dimensioned for a capacity of approx. 3,000 semi-baked baguettes per hour. Here, the typical baguette trays with the dimensions of 600 x 800 millimetres and seven convolutions are used for the product transport in the system. After the dough pieces have been deposited into the convolutions, the baking trays move into the 13 metres long proofer for final proofing which is the longest phase of the whole process. Mecatherm has developed the method of the final proofing tunnel that is based on the serial arrangement of separately motorized transport modules. It allows the selection of the operating by passing certain and with this, it can be adapted easily to the final proofing time. All baking trays go on the same paths through the process which ensures regular treatment for the final product. At first, the baking trays move through the proofing zone. Before they leave the final proofer, they stay in a second zone for a short time where the dough pieces are cooled down and conditioned for cutting. Automatic cutting is performed by a computer-controlled robot. Blades cut the dough at high speed in accordance with the three-dimensional cutting sequences saved in the program. The memory can save 20 different patterns and with this, it can control most of the usual sequences. Cleaning of the blades between the cutting procedures extends the life time of the knives and provides for more precise cuts also in difficult, proofed doughs. The common characteristic of all Mecatherm ovens is their modularity. This also applies to the gas-fired, more than seven metres long FTC oven at Inter Europol in which the dough pieces are baked on standard baking plates of 600 x 800 millimetres. They consist of several backing cells that are arranged next to each other, whereby each cell forms its own oven element with independently adjustable temperature and moistening per baking zone. If the oven capacity shall be changed, the user can switch off one or more cells and with this, it can be adapted to different hourly quantities or baking times. The Mecatherm method for plate transport is also used in the oven – the plates go the same way through the oven which ensures homogeneous quality. The oven is made of stainless steel and

The new fully automatic storage has a capacity of 20,000 pallets and is well protected from fire due to its reduced constituent part of oxygen.

on the sides it is equipped with doors with double-glazed windows to ensure the visual monitoring of the baking process and to allow the easy access to the baking chambers. The Mecatherm FTC is a pure-air convection oven with indirect heating via heat exchangers. Thanks to their compact structure, the high insulation quality and the precise control of temperature and steam zones, the ovens use low energy and need little steam. Furthermore, the chains of these oven-paternoster systems must not be lubricated. After the baking process, at first, the semi-baked dough pieces are cooled down. This is done atmospherically in the MVS cooling module made by Mecatherm. It has a capacity of more than 300 baking plates and a length of 4.4 metres. Finally, a finger deapnner draws the baguettes out of the plates. The trays are then returned back to the depositing point underneath the conveying circuit. After the oven, for cooling down and freezing, Inter Europol strongly relies on the competency of Heinen Freezing, who have already installed nine different plants for the various products. Also for packaging, the approved partner De la Ballina was employed who installed the very complex packaging plant for all production lines with much ingenuity and flexible solutions.

To cool down the pastry to the desired temperature, a capacity of 308 baking plates is planned in the MVS cooling tower.

Summary

Applying very much experience and knowledge of the industry, the responsible people at Inter Europol in Malopole have built up an entirely successful production. Peter Mitsch's and Rüdiger Stollmeier's knowledge of the baking process and its periphery and Wojciech Smiechowski's management competency form in a very successful combination. An example for it is the system of sewage water discharge in the new factory. At first, the production water is cleaned and only then, it is discharged into the public sewage system – this saves costs. Or there is the arrangement of the switch cabinets on a higher level above the production area to keep heat and dust away from the sensitive systems. In addition, the deep cold store is impressive because it has a capacity of 20,000 pallets. It was supplied and installed by SSI Schäfer. Storage of the goods as well as making them available for collection is managed fully automatically via the logistics system. With great justice, the Polish enterprise is the sixth winner of the „Production of the year" prize. „Already at those days, I believed in the chances of the market," Mitsch commented on the personal motivation for his commitment in Poland, the country, in which he has already become a native resident and where the enterprise started with supplying its own in-store bakeries, hotels and caterers. Long since, Inter Europol has not only been active in Poland but it has oriented towards Europe more and more and has established with its higher-price artisan concept there in many market niches – certainly, with all the necessary certificates, e.g. BRC or IFS that are required by the trade. „Referring the prices for the assets, raw materials or manpower, we do not see any significant advantages for the location Poland compared with our competitors in the foreign European countries. We define us by our service for our customers and our knowledge of technology about the backing process along the line – and in this field, we were very successful during the last decades, " Mitsch finishes his statements.

Gregor Vogelpohl

Technology Mecatherm

Ciabatta Line:
- Set of Peelboards
- MVS proofer
- Oven loader
- FTP stone-tunnel oven
- Buffer
- Conveying circuit

Baguette line:
- Line control
- Final proofer
- Automatic cutter station
- Modular FTC oven
- MVS cooling tower
- Automatic finger depanner
- Conveyors