



## Switzerland's largest bakery and pastry shop: a marvel of space efficiency

The major distributor Coop had ambitious production targets for its new industrial bakery in Schafisheim: the facility was to produce 60,000 tons of baked goods per year, which would be a Swiss record in this product segment. However, it was clear that this volume target could not be achieved on the small site using traditional planning approaches. The process planners at IE Food were challenged to take a creative approach to the project.

Coop built a bakery and logistics center at its Schafisheim site that sets new standards in terms of size and complexity. In addition to the national distribution center for frozen foods and the regional distribution center, the multifunctional facility now also houses Switzerland's largest bakery and pastry shop. It supplies around 360 retail outlets in northwestern Switzerland, central Switzerland, and the greater Zurich area with fresh baked goods and provides all Coop stores in Switzerland with frozen semi-finished products, known as dough pieces.

### Integrating the bakery into the overall puzzle

IE was responsible for the planning and implementation of the entire project as general planner. The bakery and pastry shop production facilities were at the heart of the overall project and proved to be a particular challenge in terms of planning for optimal operations processes. Among other things, it was necessary to find efficient solutions for the logistical connection of the bakery to the regional distribution center, the national frozen food warehouse, and the empties center in the same building.

### PLANNING AND CONSTRUCTION TIME FOR THE ENTIRE PROJECT

- > 5 Years (Oct. 2010 - Dec. 2015)

### SCOPE OF CONSTRUCTION LARGE-SCALE BAKERY

- > Production area: 30.000 m<sup>2</sup>
- > Total built-up area: 240.000 m<sup>2</sup>

### INVESTMENT VOLUME FOR LARGE-SCALE BAKERY

- > Overall project: CHF 600 million
- > Of which CHF 100 million for the bakery

### OPERATING FIGURES

- > Baked goods: 60.000 t/Y
- > Flour: 40.000 t/J
- > Deep-freeze storage: 17.000 PP
- > Trucks: > 1000/Tag
- > Bakery employees: 700

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### **From a well-thought-out concept to efficient production**

The merger of the various bakery operations and the addition of frozen food and distribution logistics meant that IE's process planners first had to thoroughly analyze and define the new process flows. They paid particular attention to the interfaces between production and logistics. The insights gained in the first planning phase served as the basis for bringing the various production and logistics functions into a meaningful context. The goal was to achieve maximum process efficiency through optimal networking.

### **A major project on a limited construction site**

Even the preliminary analysis showed that the approximately 40,000 square meter site would hardly offer enough space to achieve the ambitious production capacities. Expanding the site was out of the question, as industrial land in a prominent location is expensive and scarce. So another solution had to be found.

### **Vertical bakery production**

For IE's process planners, the solution involved thinking vertically. They determined that the new building would need to be at least 25 meters high and covered the additional space requirements by excavating 25 meters. The building was divided into eight floors. The unconventional concept of vertically designed bakery production took shape on six floors. The raw materials entrance was located in the basement, the finished goods logistics for the pastry shop on the ground floor, the pastry shop itself on the first floor, and the large-scale bakery on the second floor. Space for the changing rooms was planned for the second basement. Break rooms and offices for the bakery departments were to be located on the third floor. The functions of empty container processing and recyclable material recycling were distributed across the ground floor and the first, second, and third basement levels.

The well-thought-out arrangement of the various functional areas and the compact operating layout made it possible to keep the paths for material and personnel flows short.



The floors are efficiently accessed by vertical conveyor technology for containers and pallets, as well as lifts for personnel. People and materials can be where they are needed in a short amount of time. In a vertically designed factory, it is not possible to expand production at a later date. In order to keep growth options open, however, space reserves for additional production capacity were planned from the outset. This took into account energy and media supply as well as material logistics.

#### **Paths of bread ...**

The design of the processing operations was based on the specific requirements of the various product groups. Twelve baking lines were planned for bread production, which were to be connected directly to the deep-freeze frosters. For reasons of space, there was no other solution than to arrange these on the floor below. The cooled bread intended for deep-freezing is now transported through a ceiling opening into the spiral freezer on the first floor, where it is deep-frozen, packaged, palletized, and finally transported to the adjacent deep-freeze warehouse. Fresh bread is packaged immediately after production on the same level and transported via the walkway to the regional distribution center across the street. This is where order picking and delivery take place. Time is a key factor in the production of fresh bread and must be taken into account in process planning.

#### **... and the strawberry cakes**

The industrial production of confectionery products can hardly be compared to bread production. Here, the flows of various semi-finished and raw products from different internal and external sources must be brought together. The example of strawberry cake production shows that process planning must pay particular attention to hygiene. The process is divided into dough production, baking the cake bases in the hot pastry shop, and topping them with strawberries. These are washed and cut up in the preparation department, which is strictly separated from the actual production area. The topping is done in the fresh pastry department, which is subject to the strict regulations of the highest hygiene level. Separating the flow of goods prevents contamination of the finished product by unwashed strawberries and containers.



### **Sustainable heating solution**

Coop attaches great importance to conducting its business activities in the most environmentally friendly way possible. In this context, the issue of energy also enjoys high priority. At the industrial bakery in Schafisheim, the thermal oil for the baking lines is heated using wood chips and milling by-products from Coop's Swissmill grain mill. Heating the thermal oil system of a bakery of this size is a first in Europe and a prime example of sustainability.

### **Every square meter counts**

The planning and realization of Switzerland's largest bakery and pastry shop was a challenging project that gave IE planners the opportunity to demonstrate their creativity and flexibility in many ways. One example of intelligent use of space is the design of the columns on the two floors of the bakery and confectionery. The prefabricated concrete columns were fitted with brackets. These made it possible to arrange the production facilities one above the other without having to install expensive steel structures. The building and facilities use the same supporting structure. This resulted in lower construction costs and greater operational efficiency.

### **Balancing construction and operations concerns**

A critical factor in the project was the coordination of construction and operational requirements in terms of timing. Given the scope of the project, the planners estimated that it would take 2.5 years from the start of construction to the delivery and installation of the baking equipment on the second floor. The building structure and its central elements, such as elevator shafts, stairwells, and main logistics axes, had to be cemented in place at an early stage. This required early coordination with the plant concept. In contrast, the client tended to wait before procuring the equipment. The intention was to have the latest technology available when production started. The dilemma was obvious, but through joint, forward-looking planning, it was possible to find an optimal solution.

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## **Kontakt**

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### **IE Food Zurich**

Wiesenstrasse 7  
8008 Zurich | Switzerland  
T + 41 44 389 86 00  
zuerich@ie-group.com

### **IE Food Munich**

Paul-Gerhardt-Allee 48  
81245 Munich | Germany  
T + 49 89 82 99 39 0  
muenchen@ie-group.com