

# System benefits

DOMINO'S PIZZA UK&IRL LTD. IN MILTON KEYNES, UK, HAS INAUGURATED A NEW DOUGH PRODUCTION FACILITY WITH HIGH TECH AUTOMATION AND OPERATION FEATURES THAT WILL SERVE AS A MODEL FOR FUTURE BUILDINGS

++ figure 1



**+** The similarity with the football stadium of the MK Dons is obvious. The architect who designed the stadium also designed the neighboring production building for Domino's Pizza Group UK&IRL Ltd.

Domino's Pizza Group UK&IRL Ltd., the British subsidiary of the globally operating US-American pizza delivery group Domino's Pizza, also operates two more production facilities in Penrith in the north of the country and in Naas, Ireland, besides the one in Milton Keynes. All facilities serve more than 620 franchisees with everything they need, from dough and pizza toppings to packaging and work clothes. The British and Irish Domino's use only fresh dough different to many other countries, according to their motto "always fresh, never frozen".

The new production facility on the fringes of Milton Keynes will replace the facility in the center of the city and is both a dough production and logistics center. The move that will start in the coming days is accompanied by a reduction in production jobs from 27 to just 9. The annual savings for the change alone is estimated to be more than one million pounds Sterling. The Food Service Director of Domino's Pizza Group UK&IRL Ltd., Gareth Franks, is the master of the facility that currently delivers its products to about 330 franchisees although the facility has the capacity of serving double that amount of customers. His biggest challenge is the large fluctuation in demand over the week (see interview). While business is booming from Friday through to Sunday, the sales figures for the other days are clearly lower.

Therefore, the dough production is separated into two congruently arranged systems. The entire facility has a capacity of 2,400 trays/h. The dough is prepared fully automatically

by two ExAct mixers by Reading Bakery Systems, USA. The dough division is carried out on a Vemag plant while Baker Perkins belts and conical rounders shape the dough. The formed dough balls are then transported one after the other to four depositing places where they are positioned by an ABI/Gemini unit in a predetermined pattern. They are then placed into plastic crates with a lateral height of almost 10 cm which are fed from below to the depositing unit. Under pressure not only keeps the plastic crate in place, but also maintains the planar bottom of the crate and ensures that the depositing pattern of the dough balls is retained.

The boxes are then cooled for one hour at -4 °C, stacked into two rows with 25 crates in each stack and then stored for a maximum of 24 hours in an automatic storage unit delivered by Numafa at +2 °C. At time of dispatch, all are made available with the other raw materials in the dispatch area for

## Domino's Pizza

Domino's Pizza is an international pizza delivery service that was founded in 1960 in Ann Arbor, Michigan, USA. Domino's has business in all US states and about 60 foreign countries.

In total, the group has more than 9,000 stores worldwide. Since 2004, it has been traded on the stock exchange. In general, there is a master franchise company in the individual countries. In the UK it is Domino's Pizza Group UK&IRL Ltd. Currently the Australian master franchise company is finding its way into the markets in the Netherlands and in France. +++



++ figure 2

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++ figure 3

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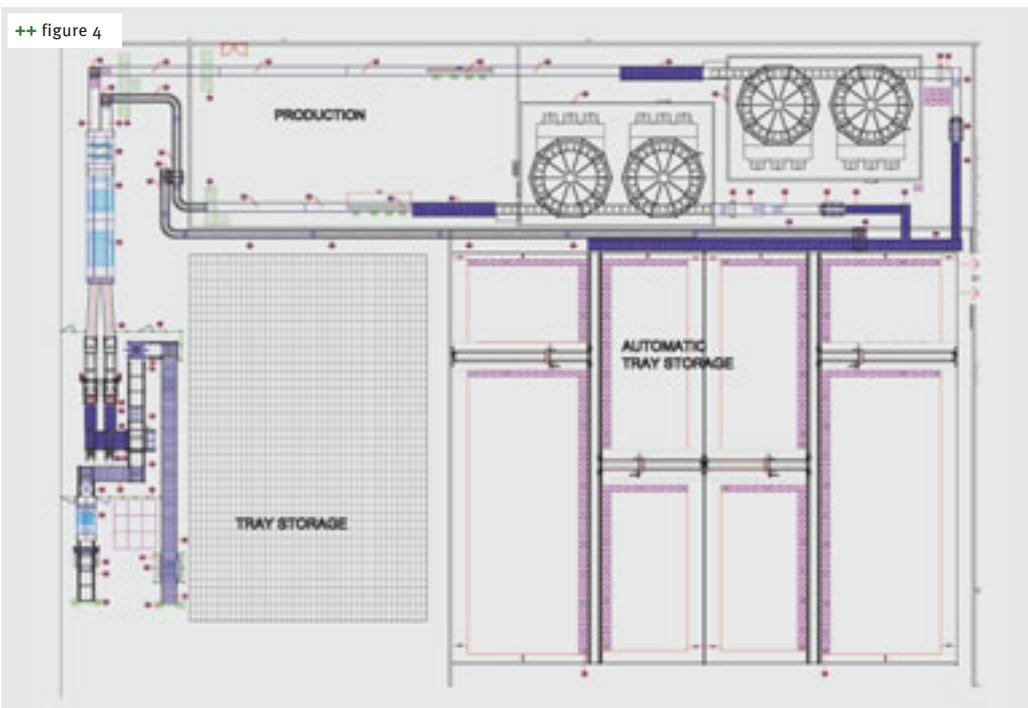
++ figure 1  
Domino's Pizza in Milton Keynes, Great-Britain, is considered to be the model for all future production facilities of the global chain group

++ figure 2  
As they arrive the pile of crates are destacked; one crate after the other is tipped so that only debris can fall

++ figure 3  
The crate stacks are removed individually from the truck and pulled onto the pallets where they await their turn. If crates are requested, one pallet delivers four stacks at a time. They are taken from the pallets, washed and made available for production

their transport to the franchisees. The dough balls come in three different sizes and they are only picked immediately before the small trucks are loaded. After arriving at the franchisee, the dough is stored chilled for maximum 4 days. Production planning is generally based on the order quantities as stockpiling for several days is not provided for. The entire operation including delivery to more than 300 customers each day is a highly sophisticated task that needs a lot of planning and organization. It could not be handled without an ingenious conveying system. This has been provided by the Dutch Numafa Group, including crate washer. The equipment delivery by the Dutch company starts with the reception of the used crates that arrive empty from the franchisees. The stacks are pulled onto pallets and stored in a "dirty" storage. The pallets accelerate the process of storing and retrieval of crates from the storage areas. If the pro-

duction requests more crates, one pallet with four stacks (30 crates high) is integrated into the process. A robot transfers the stacks that consist of red and blue crates. The blue ones are intended for the dough balls; the red ones are empty and are placed at both ends of the stack as a hygiene buffer. The cleaning process is carried out on two parallel rows in order to ensure the required throughput. First of all, the stack of crates is tilted so that the upper most crate falls onto the conveying belt; a container underneath this station then collects only dirt, debris and product residues that are returned with the crates. The pallet is also washed with clear water with a pressure of 4 bar. The crate, which is now upside down, runs through the crate washer where it is pre-rinsed with water at 59 °C. The next step is washing with a 62 °C hot alkaline solution and 20 bar pressure before the crate reaches another high pressure ►



++ figure 4

++ figure 4  
Scheme of the Numafa production line

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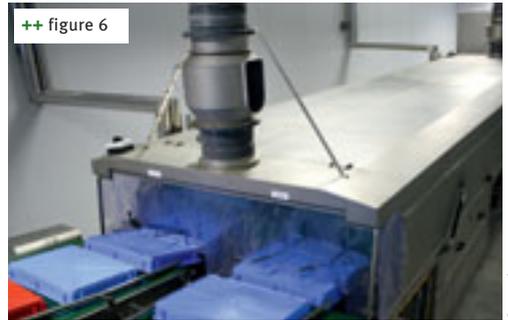
### Core business: crate handling

Today's Numafa Group originated from two companies: Polyketting which predominately builds conveying equipment and belts for the beverage industry, and Numafa Cleaning & Logistics that belonged to the Meyn Holding which constructs poultry slaughter houses and washing plants for the entire food industry. In 2009, Berto Odink (already main share holder of Polyketting) took over the Numafa CL activities and combined both Polyketting and Numafa CL in the Numafa Group. Their headquarters and engineering division is located in Numansdorp, while the production facility is in Zelhem, both in the Netherlands. The company employs 130 people and had a reported turnover of about 20m Euros last year. The Group's product range includes industrial plants for the handling and cleaning of crates, pallets, containers and baking trays. Standardized solutions for conveyers, storage, buffers, palletizing and de-palletizing, stacking and de-stacking, folding and unfolding of crates, washing, drying and control are turned into individual customized solutions. Numafa's green label provides ecological solutions upon request. +++



++ figure 5

© Numafa



++ figure 6

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station where the inkjet markings are removed from the crate. At the final station the crate is flushed with fresh water after which it moves through an air blow section with 4 ventilators. Some air knives also "scrape" the water from the crates. This type of drying has been chosen as the crates have a solid bottom. Bread crates with perforated bottoms will commonly be dried with a centrifugal dryer.

Once dried, the crate is turned around and placed on a conveying belt separated by colors. If there are insufficient crates of a certain color, more crates are supplied from the buffers. Berto Odink, one of the owners of the Numafa Group, explains, "We have not only gained a lot of experience in the baking industry but also in the meat, fruit and vegetable industries. We are able to construct highly indi-

vidualized plants on industrial scale which consider individual requirements in terms of crate management, stackers, palletizers, folding stations, buffer zones, storage, supply and washers. Our washers are designed to deliver an optimum cleaning result using a combination of time, temperature, cleaning agent, pressure and an amount of water while saving resources. The washers are equipped with different filter units depending on the requirements and pollution degree. Filtration systems are of utmost importance as they affect the life cycle of wash water.

Besides the crate handling and the crate cleaning, Numafa also provided the entire crate conveying system within the production and storage areas. It is only the chillers that have been purchased from a third party. +++

#### ++ figure 5

Spraying pipes with wide spray nozzles are integrated into the numbered pipes. The nozzles, made from stainless steel, are simply screwed into the main washing zone which makes them easy to exchange. The spraying angle of the nozzles is based on the trays. The pipes are numbered so that the same spraying direction can be achieved after the cleaning process

#### ++ figure 6

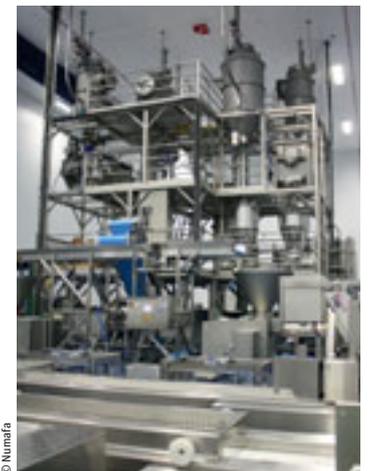
Every crate, whether blue or red, has to pass through this washer. The number of requests for cleaned crates controls the amount of crates coming from the delivery storage and going through the crate washer.

### Mixing system at Domino's

The Domino's Mixing System consists of two Ex120L Exact Mixers. The mixers are each capable of producing 10,000 to 12,000 pounds per hour. Each mixing system consists of a mixer, dry and liquid metering systems and a dry materials blending system. Dry ingredients are brought to the mixing area by means of pneumatic transfer, and liquid ingredients are pumped by means of liquid transfer systems from storage tanks. All ingredients are then metered into the mixers, using loss in weight feeders, at the required rates and concentrations to produce the desired dough. The entire system is computer controlled with the entire process documented for review.

Some advantages of continuous mixing include:

- + 20,000 pounds per hour of dough can be manufactured by one person.
- + Just in time dough production.
- + Automatic inventory monitoring and reporting.
- + More consistent product than is possible with a manual process. +++



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