

# Logical logistics

THE BOLLETJE BV COMPANY FROM ALMELO, THE NETHERLANDS, PRODUCES “BOLLETJE” DUTCH RUSKS UNDER EXACTLY THAT BRAND NAME – AND HAS USED A SOPHISTICATED RAW MATERIALS LOGISTICS SYSTEM FROM THE ZEPPELIN REIMELT GMBH COMPANY, RÖDERMARK, GERMANY, FOR THE RUSKS SINCE THE EXPANSION PHASE IN ALMELO



++ figure 1

++ figure 1  
The outdoor silos contain flour or sugar



++ figure 2

++ figure 2  
The coupling station for the road tanker includes a drier

**+** Although the translation of Bolletje is “little bullet”, any Dutchman, if asked would answer in a flash that they are the typical Dutch rusks. To produce them, a carefully weighed ball of dough – a bullet – is baked between two mould plates so that it becomes flat and round, after which it is sawn through and toasted. The result is a circular rusk with a structure that is firm due to the toasting, but tender as a result of the recipe and manufacturing process. To earn the brand name Bolletje, it must also have a special feature, a small recessed grip at the side to make it easier to take out of the pack. Brand awareness in the Netherlands is 98 %, which makes it the country’s second best known food brand.

Incidentally, Bolletje BV is also the name of the business founded in 1867 with its headquarters in Almelo, which produces a lot more than just rusks. Bolletje lays the Dutch table, mainly for breakfast, with its production program of rusks, crackers, crispbread, honey cake and a very dark rye bread with a long shelf life from the three bakeries in Almelo, Amsterdam and Heerde. The range is rounded off with chocolate biscuits, pretzel sticks and seasonally manufactured “Pfeffernüsse” (spiced gingerbread biscuits). More than two thirds of the turnover is sold under the Bolletje brand, the rest being private label brands. The proportion exported is

currently around 30 %. The total number of employees at all three sites is in the region of 500.

However, it is possible that the structure might change in the foreseeable future. Last autumn the owning family, Ter Beek, announced its sale to the Continental Bakeries group, which is more than four times as large in terms of turnover. Continental Bakeries, whose headquarters are in Dordrecht, belongs to the Netherlands investor group NPM Capital and operates a total of 14 different factories in Europe producing toast, snacks, biscuits, cookies, rice waffles etc. The group’s brands include Haust, Hig, Auer, Brink, Bussink, Pirou, Brinky, Stieffenhofer and Gille. Otherwise, the group concentrates heavily on manufacturing its own label brands. Turnover is around EUR 345m. The Netherlands competition watchdog (Dutch Competition Authority (NMa)) is currently examining the planned merger.

However, this does not adversely affect the on-going investments in Bolletje’s factories. In Almelo, which is the location of the company’s central logistics, among other things, two new lines are currently under construction, including the first expansion phase of a high-capacity line, almost 200 m long for rusks. Dough is produced on a conti mixer made by the Werner & Pfleiderer Industrielle Backtechnik GmbH Company, Tamm, Germany, which is fitted with a double



**++ figure 3**  
Advertising their own business – the bright red tanker vehicle collects flour in addition to the usual mill deliveries



**++ figure 4**  
The in-line sieving station

jacket through which the mixer can be connected to the in-house cooling system.

Bolletje has invested not only in converting a former warehouse shed into a production area but also in a completely new raw materials logistics system for the rusk line and the new crispbread line supplied by batch mixers. The raw materials supply system with its three outdoor silos for flour (100 m<sup>3</sup> each) and one for sugar (90 m<sup>3</sup>), from goods acceptance, storage, premixing and dispensing of the dry, paste and liquid raw materials to the precision dispensing into the continuous mixing process, was fabricated by the Zeppelin Reimelt GmbH Company, Rödermark, Germany. It has become an integrated unit that is impressive not only due to its sheer size but also and above all due to the many intelligent technical details.

The uniqueness starts right from the outset with the outdoor silos, all of which are on load cells that report their values to Bolletje's central control system when material is removed from them. Bolletje uses an ERP (Enterprise Resource Planning) system of its own which, linked to an MES (Manufacturing Execution System), ensures not only the processing of each order all the way to line planning, but also guarantees unbroken traceability for every product that is produced. It also documents the occurrence and final whereabouts of samples as well as waste materials such as dough residues etc. This control system, which was first installed four years ago in a department in Almelo and has covered the entire business for the last two years, even includes the company's purchasing department, which receives a report automatically about whether and when something is consumed. The system provides a seamless picture of all the procedures and processes in the entire company.

Each aluminium silo is equipped with a drying plant to dehumidify the air space in the top of the silo. All flour must pass through an in-line sieving station on its way to the mixers, again with the aim of operating to the highest possible hygiene standards. Incidentally, conveying is done suction-pneumatically using filtered air.

B-J Hudepohl, Head of Engineering at Almelo, also stresses that together with hygiene, safety was a key theme when awarding the contract. In this respect safety covers not only explosion protection in accordance with the EU's ATEX (Explosive Atmospheres) Directives, which is important

mainly for the granulated sugar silo, but also the employees' occupational safety. The aspects where this is apparent include easy access to plants and tanks, the large openings, e.g. at the in-feed station for bagged materials, and the low-effort platforms and steps installed, for example, at the big-bag stations and everywhere that staff must have access, even if only for monitoring purposes.

At Bolletje, the most important step in the manufacture of rusks is the use of a pre-dough, which is called zetsel (poolish). This is made by blending a few dry components in a spiral mixer and weighing them into the poolish mixing tank via ▶

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++ figure 5  
Liquid fat tank



++ figure 6  
Mixing tower



++ figure 7  
The original product: Bolletje Beschuit (rusk)

a differential weigh-feeder. The liquids are added and mixed, after which the mixture is pumped into the fermentation tank. The poolish (pre-dough) can then be dispensed into the conti-mixer together with the so-called gelee, a liquid pre-mix of minor components. The dispenser for poolish and gelee is mounted directly above the line, so it feeds the components directly into the continuous flow of solids. Water and, if necessary, egg are also added at this point.

The manufacture of poolish in turn takes place in two steps, the mixing phase in the batch tank and the fermentation phase in one of the four double-walled tanks. The tanks are kept at a constant temperature and are equipped with a stirrer. They also have a connection to the CIP (Cleaning In Place) cleaning system, which in turn has access to a hot water tank with detergent, a tank for process water and a mains water tank.

A tailor-made solution is also available for each of the other raw materials: the liquid yeast is delivered in road tankers and stored in double-walled tanks where it can be both cooled and stirred. One of the raw materials reaches the company in returnable containers that stand in a warm room. The

pipelines are of double-wall construction so they can be heated. Another raw material in liquid form is also delivered in returnable containers, but ends up in a refrigerated room and flows to the offtake point through pipes that can be cooled because they are double-walled. This pipework is also connected to the CIP plant.

All raw materials, whether dry or liquid, are weighed out gravimetrically, so everything is related on the basis of mass. All the tanks and pipework are fabricated from stainless steel, with only a few exceptions for corrosive substances. All dry pipework is cleaned by a suction blower and all liquid pipework by connecting it to the CIP cleaning system. All the control units in the entire factory are equipped with identical interfaces, so there is no need for the operating personnel to learn a new system.

The crispbread line, which is already in production, is supplied from the same raw materials logistics, although in contrast to the new rusk line it operates using batch mixers but without a predough. Moreover, Zeppelin Reimelt has planned and sized the entire raw materials logistics in such a way that it can supply three additional lines if necessary. +++



++ figure 8  
In-fed station for bagged materials and big-bag station



++ figure 9  
Production of zetsel

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