Photo credit: Bosch Packaging Technology

Portion-packed crackers

To automate or not to automate

According to the Canadean intelligence database on the outlook of the biscuit market (Canadean intelligence database, Biscuit-Outlook_Countries_Value-Volume_2014-2018), China is the largest plain cookie and cracker market by volume, with 63% projected market growth between 2014 and 2018, followed by India with growth expected to top 103%. Latin America, Western Europe, South East Asia, North America and the Middle East and Africa also offer high growth rates of between 30 and 66%.

It is hard to meet such rapidly growing market demand without the help of fully or partly automated production lines, especially in developing markets where the share of manual processes is still high. Food manufacturers mirror this statement, naming investments in technology as the main source of significant cost rises (44%) until 2021, followed by investments in innovation in new types of packaging (43%) and compliance with legislative changes (33%). At the same time, 29% of respondents expect to benefit from investment in manufacturing equipment over the next five years.

There are many perceived challenges relating to automation. When considering new equipment for their flexible packaging systems, European manufacturers prioritise running costs, while North American producers are concerned about the initial cost of purchase. Asia-Pacific companies are searching for ultimate adaptability to different pack sizes and materials, whereas the rest of the world opts for ease of operation (Canadean, Global Executives Survey, Growth of Flexible Packaging, pages 40-41) (see chart 1). Machine speed accounted for only 8% of global manufacturers' concerns. At Bosch Packaging Technology, we discussed automation issues extensively with our biscuit customers and prospects. There are three main areas of concern when taking automation to the next level (see chart 2):

Scalability is the first stumbling point. For biscuit manufacturers automating for the first time or testing new products and markets, fully automated lines might be too high a barrier for entry. That is why Bosch Packaging Technology has developed various solutions, from entry-level to fully automated. New companies may start with hand-fed wrappers for cookies and crackers, gradually adding feeding systems, carton erectors and formers.

The easiest way to start is to have manual secondary and tertiary equipment with automated primary packaging at the heart of biscuit packaging. All other elements can be automated at a later stage, allowing producers to grow their production in line with sales (see chart 3).

Adaptability to various pack sizes, formats and materials is the second important point of concern. For some manufacturers in emerging markets, the ability to reduce or increase the number of biscuits per pack, if required, is a matter of survival when faced with fluctuating raw material costs. For others, an opportunity to run seasonal promotions and adjust to consumer demands is an important factor. All of them, however, are looking to future-proof their production.

Biscuit producers need to consider how easily they can change between different pack sizes and formats. For example, when designing a packag-

ing system, conventional magazine feeders limit the number of biscuits per stack to the number of incoming lanes or a multiple of this number. The reason behind this is that typically only a fixed number of biscuits can be extracted per magazine. To create a stack of eight, either eight magazines would be required, or four if two were extracted at the same time. To create a stack height that is different from the number of magazines or its multiple, major changes to the packaging system would be necessary, such as implementing additional vibratory channels.

Innovative technologies, however, enable format flexibility irrespective of the incoming product supply, allowing manufacturers to change stack height as well as pack configu-ration without having to alter the production line. Product shelf differentiation is boosted thanks to the large variety of options tailored to the diverse demands of targeted customer segments. At the same time, primary packaging can now be easily adapted to various secondary and end-of-line packaging requirements, whether this be retail-ready sets favoured by supermarkets or individual sales units ideal for the weekly family biscuit supply.

Easy changeovers allow producers to reduce operator errors and downtime through the use of repeatable and programmable set-ups. Tool-less changeovers should always be the preferred choice for manufacturers, especially in regions with shortages of qualified personnel. Innovative

Photo credits: Bosch Packaging Technology

Toploaded packed crackers

What strengths do manufacturers see in flexible packaging?

Noth America

Barrier properties	71%
Production costs	57%
Convienience for consumers	43%
Ease of the production process	36%

Europe

Transportation costs	53%
Recyclability	53%
Barrier properties	41%
Ease of the production process	41%

Asia -Pacific

Transportation costs	64%
Barrier properties	45%
Ease of the production process	45%
Quality and variety of printing options	45%

Rest of the World

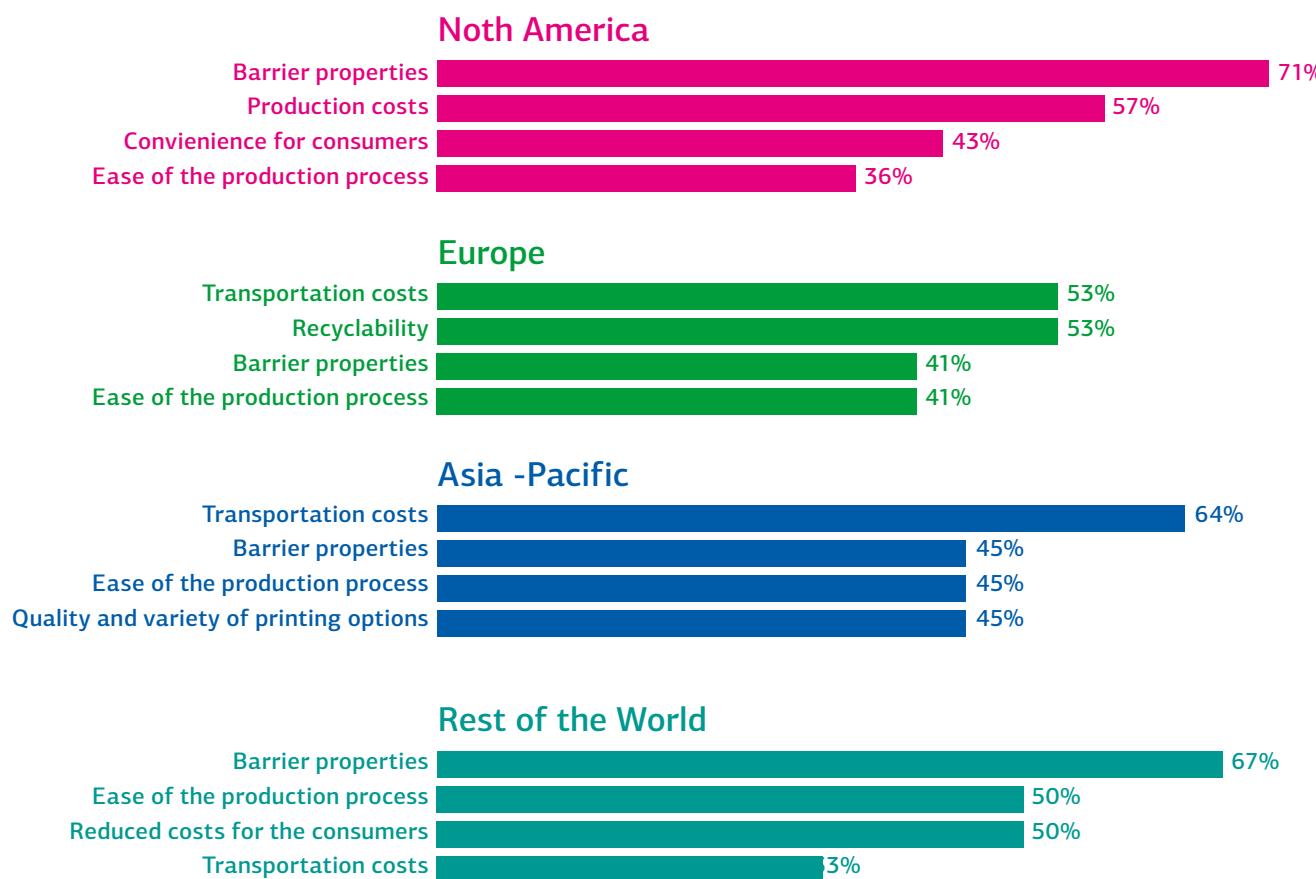|	
Barrier properties	67%
Ease of the production process	50%
Reduced costs for the consumers	50%
Transportation costs	3%

Chart 1: Strengths of flexible packaging equipment

Three points to consider when taking automation to the next level

Chart 2: Three points to consider when taking automation to the next level

'push-button' changeovers, for example, enable biscuit stack height changes via programmable modifications to recipes.

Compliance with legislative changes is the third most important concern for manufacturers, as they face increasing pressure to enhance safety in the food supply chain in response to new global regulations. This includes the final rule of the Food Safety Modernization Act (FSMA) published in the USA in September 2015. Compliance became mandatory for companies with fewer than 500 employees in September 2017, with the final deadline for smaller manufacturers (with less than $500,000 in annual revenue) in September 2018. Packaging machinery manufacturers work closely with food producers to ensure that equipment complies with the latest regulatory standards.

Automating production lines makes it easier for biscuit producers to meet specific hygienic requirements by, for example, limiting human contact with product. Other areas to look for include easy-to-clean features, accessibility and open machine design. Fewer cables, crevices and holes that can trap food ensure systems are not only sanitary but also easy to maintain, boosting uptime and therefore productivity. ∎

………………………………………….
………………………………………….

About the author

Andreas Schildknecht is Product Manager Mid-range Systems, Food at Bosch Packaging Technology.
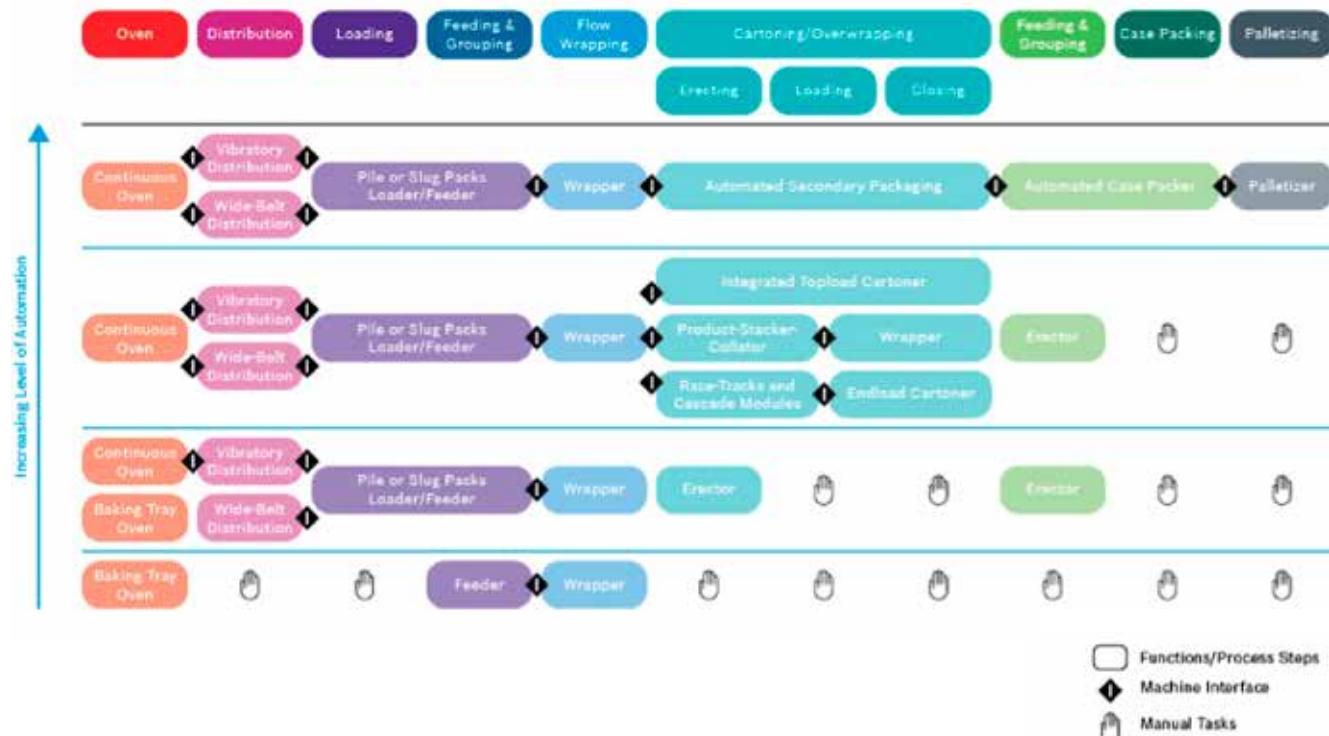
Cookie and Cracker Packaging
Scalable Level of Automation

Chart 3: Automation levels for cookie and cracker packaging