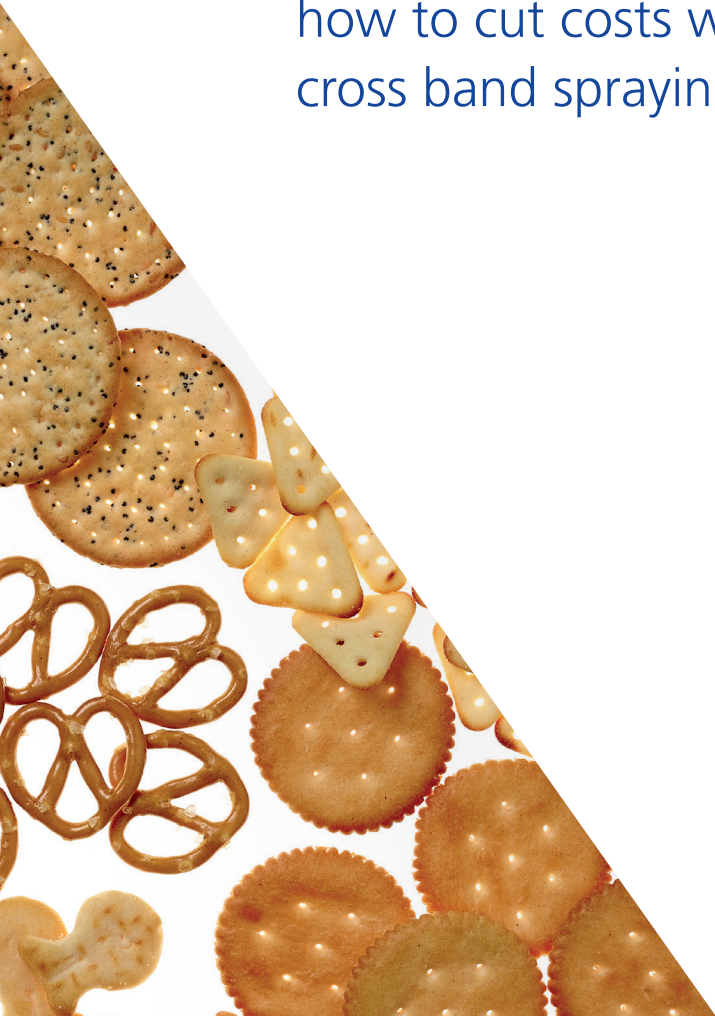


a **TNA** whitepaper

five key factors for effective oil spray applications

how to cut costs with the right
cross band spraying system





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With a degree in chemical engineering and as an active member of the Biscuit and Cracker Manufacturers' Association, David has been involved in the snack industry for 27 years. David joined TNA back in 2011 and is actively involved in the development of new spraying and seasoning technology to assist customers all over the world in applying flavour to snacks and other foods..

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summary

introduction

Oil spray systems play an essential role in the production of snacks and baked goods. They not only provide flavour, but also affect the look and integrity of the product, ensuring that it fulfils consumer expectations for taste, feel and appearance.

With operating costs on the rise and competitor offerings getting stronger, an effective oil spray system can be the important cost difference in any snack or bakery processing plant. By enabling manufacturers to optimise processing efficiencies, minimise downtime and maintain the highest quality standards, oil spray systems can have a real impact on profitability and customer loyalty.

Furthermore, the addition of powder or liquid flavour into the oil creates a flavoured slurry that can maximise product taste and increase the number of products in a range. There are multiple spraying solutions available, however, it is important that food processors consider a number of key factors when choosing their equipment.



1

application accuracy the products to be conveyed

Oil or fat are one of the key ingredients in most snack and bakery production lines. Besides influencing the taste and texture of a product, it also significantly improves the adhesion of flavours and acts as a binding agent to improve particle cohesion. Applying the right amount of oil onto the product is vital to satisfy consumer demand for uniform appearance, taste and texture. However, the amount of oil used not only affects the sensory attributes of the product, but also the calorie count on the label. With an increasing number of people concerned about their health and wellness, this declaration on a product label is becoming more important than ever. According to research, 51 per cent of US consumers 'always' or 'usually' look at fat content on the label.¹

For manufacturers this means that the amount of oil needs to be controlled accurately, so the product meets the nutritional value specification on the label. In addition, machines that are able to handle higher concentrations of seasoning powder require less fat and oil to be sprayed onto the products for the seasoning to stick, opening up further possibilities of lower fat applications and minimal fat declarations.

Oil spray systems play a key role in ensuring that each product is evenly coated and contains an adequate amount of oil to meet labelling requirements. Only the most accurate spraying technology will be able to provide consistency of application, constant flow rates and precise spray patterns. Leading spraying solutions providers, such as TNA, have the technology and expertise to provide manufacturers with tailored solutions to suit their specific spraying needs.

Spraying solutions from TNA deliver superior reliability and full control over the entire spraying process. Advanced spinning disc technology ensures the highest level of accuracy by pumping liquid through unpressurised large bore piping to the centre of the spinning disc.

Through the centrifugal forces of the rotating disc the liquid is broken up, ensuring that it is dispersed in droplets off the edge of the disc. Droplet size can be regulated accurately

by adjusting the disc speed, according to the viscosity and volume of the liquid. While fixed speed discs are relatively common in most machines, finer control of disc speed can be achieved through an inverter.

The result is an evenly finished product that uses only the minimum amount of oil required to achieve the necessary functional benefits. Tighter control over the entire spraying process also ensures greater efficiency and reduced manufacturing costs.

2

material waste limit waste to cut costs

Oil is not only one of the most important ingredients on the snack line, but also one of the most expensive.² A typical 1m wide cracker line uses approximately 12 to 18 tonnes of oil per week. At an average kilo price of \$1 per kilo, it is essential for manufacturers to reduce waste to an absolute minimum in order to remain profitable.

When it comes to snack processing, misting, overspray and giveaway are some of the main problems experienced by manufacturers. Often associated with inaccurate spray nozzles or ineffectively positioned spray discs, overspray and mist directly affect raw material costs and if not dealt with immediately can become a real safety hazard.

Giveaway, on the other hand, occurs when too much oil is applied on some or all of the product. A giveaway of just 6 per cent could result in an annual loss of \$50,000 for a production line using 12,600kg of oil a week. With production lines getting wider, latest advances leading to widths of 1.75m at times, achieving a uniform application of oil across this width has become even more of a challenge than ever before.

“In order to limit waste and maximise profitability, manufacturers need a fully engineered solution that ensures consistent spray to all parts of the production band.”

1 <http://www.mintel.com/press-centre/food-and-drink/fifteen-percent-of-dieters-are-concerned-about-salt-intake>

2 <http://www.bloomberg.com/news/2013-06-18/food-use-seen-by-oil-world-driving-cooking-oils-as-biofuels-slow.html>

In order to limit waste and maximise profitability, manufacturers need a fully engineered solution that ensures consistent spray to all parts of the production band, and which can cope with filtration of salt and cracker debris over long periods of time. Eyebrow technology from TNA enables spray patterns to cross over from each disc, achieving coverage from all angles across the entire width of the band, and allowing oil to build up progressively.

Furthermore, spinning disc solutions from TNA can handle up to 2.5 litres of oil per minute per disc, of which 20 per cent is accurately sprayed onto the product. The remainder of the liquid is captured, channelled back into tanks, filtered and re-used to reduce both waste and raw material costs. As a result, only a minimum amount of oil is wasted, protecting profits and maximising raw material usage.



3 material waste control maintenance to reduce downtime

Regular system maintenance is important in the food industry to ensure processes are running smoothly and effectively. All equipment needs to be checked and cleaned on a regular basis to provide the highest level of food safety to protect both consumer and business reputation. While scheduled maintenance is inevitable, unscheduled repairs can have serious consequences on line efficiency and plant profitability. For example, not only do large ovens in cracker production lines take up to five hours to heat up, resulting in increased energy use and unnecessary downtime, but impromptu shutdowns often also incur a high level of unfinished product waste.

Both the design and material of the spraying system are important factors and can help facilitate maintenance and minimise plant downtime. Many providers, such as TNA, offer self-cleaning spraying systems with only a minimal number of movable parts that can be individually replaced and maintained whilst the machine is still in production. Furthermore, an effective control and monitoring system can examine motor currents and is able to give advance notice of failure, effectively eliminating unscheduled downtime.

4 plant hygiene and safety create a safe and hygienic workplace

Maintaining the highest level of plant hygiene and safety is paramount to any food production site. A badly engineered spraying system can have a serious impact on production, food hygiene and employee safety. Excessive mist can easily cause local environmental hazards, such as slippery surfaces and floors, diminished visibility and reduced air quality. At the same time, oil mist can linger in the air and eventually settle on other ingredients, risking cross contamination and raising food safety concerns.

Besides ensuring that adequate safety measures are in place and regular cleaning schedules are adhered to, low mist spray systems and negative pressure spray zones can help towards a safer and more hygienic working environment. Mist extraction systems prevent oil from entering the plant environment, and the spinning discs set up to avoid producing the smallest droplets

“Low mist spray systems and negative pressure spray zones can help towards a safer and more hygienic working environment.”

which are the mist, reducing downtime and increasing the reliability of the production process. Adding a continuous filtration system to the spraying machine will help keep pipes and oil free from crumbs, salt or fines, reducing the risk of cross contamination.

All of TNA's equipment is manufactured from food grade stainless steel, making it easy to clean and capable of withstanding the impact of a high volume of oils and fats during processing. TNA spraying systems are simply constructed and contain only the minimum amount of moving parts, which are easily accessible, ensuring the highest level of hygiene and safety.

Major components can be easily removed or replaced with readily available spare parts, and with spare spray heads such maintenance is even possible when the machine is running for an uninterrupted production flow.

5 flexibility in design create a safe and hygienic workplace

Rapidly changing consumer demands have increased the pressure on snack and bakery manufacturers to run a variety of capacities, package sizes and materials within their plants. To increase their product portfolio at minimum cost, food manufacturers are increasingly looking for more flexibility in their existing processing lines. Today, products and flavours must be changed over quickly, outputs need to be adjusted according to demand, and oil spray levels regulated in an instant.

Spraying systems need to offer rapid cleanability for flavour changes and quick or automatic change of flow rate to fulfil different production needs and applications. Integrated cleaning aid systems can support the cleaning process by spraying hot water and detergent throughout the machine.

Controlled by a programmable logic controller (PLC), they can act as a secondary means of cleaning the conveyer and spray heads, significantly speeding up the changeover process. As a result, processes can be tailored to each of the products for higher product application flexibility and reduced downtime.

summary

Oil spray systems are vital components for a more efficient snack and bakery production line. Finding a cross band spraying system that can deliver on all of the above considerations is not always easy. By working with total processing and packaging solutions providers like TNA, manufacturers can be confident they will receive the service and quality of equipment that will enable them to cut costs, reduce waste, increase quality while facilitating a smooth and safe production process.

If you would like to find out how TNA can help you choose a spraying system that suits your needs then please contact us at www.tnasolutions.com or email us at tnateam@tnasolutions.com



TNA is a leading global supplier of integrated food packaging and processing solutions with over 14,000 systems installed across more than 120 countries. The company provides a comprehensive range of products including materials handling, processing, cooling and freezing, coating, distribution, seasoning, weighing, packaging, inserting and labelling, metal detection and verification solutions.

TNA also offers a variety of production line controls integration & SCADA reporting options, project management and training TNA's unique combination of innovative technologies, extensive project management experience and 24/7 global support ensures customers achieve faster, more reliable and flexible food products at the lowest cost of ownership.



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