



The benefits of hot-needle perforation for ovenable films

Developers and manufacturers of savoury pastries and meat snacks for the retail sector have a tricky balance to strike. On the one hand, their products need to have a long shelf life and therefore must be well protected from the external environment. On the other, the films in which they are packaged must be permeable to moisture to ensure the pastry stays crisp and appetising. Hot-needle perforation is an ideal solution to this problem.

With the introduction of exotic flavours, meat-free variants and entirely new formats, the UK market for savoury pastries and meat snacks remains strong. While sales volumes may have dropped a little from the highs of 2020 and 2021, the value of the market has increased by 2.6% to £1.65bn, driven by a 5.3% rise in average prices. Still, the key players in this industry are not resting on their laurels and are looking to drive growth, by broadening their appeal through innovation.

Ginsters, which has grown its sales by 4.1% to £105m, is leading the way in introducing new cuisines. In October 2021, for instance, the company launched four world food bakes: Cajun Spiced Chicken; Mac & Cheese; Philly Cheese Steak; and Harissa Spiced Chicken. The Meatball Marinara Bake was added to this line-up in May 2022.

Pukka is taking a similar approach. Its Chicken Balti Pie, which was among its rolling roster of exotic limited-edition recipes, became a permanent fixture of its chilled range back in 2020. Pukka's vegan offerings – including a Vegan Sausage Roll, frozen Vegan Minced Steak & Onion Pie, and chilled Vegan Chicken & Mushroom Pie – have been key in generating incremental growth for the company. Pukka now boasts 35 products across frozen and chilled, encompassing everything from single and multipack frozen and chilled pies to vegan products!

The importance of packaging

Such innovations will play a key role in the development of the market for savoury pastries and meat snacks, but equal attention must be paid to how these products are packaged. Flexible film packaging is vital for ensuring that the quality of the product remains consistent over its shelf life and for preventing the spoilage of the product as it travels through the supply chain. The right packaging, combined with the correct storage temperatures, can help to create conditions that will delay the ageing of a product.

The ability to control the transmission of oxygen, carbon dioxide, ethylene and water vapour through the flexible packaging for savoury pastries and meat snacks is key, as the optimum storage conditions vary according to the type of product, the type of pastry and the way in which it is designed to be re-heated.

Challenges

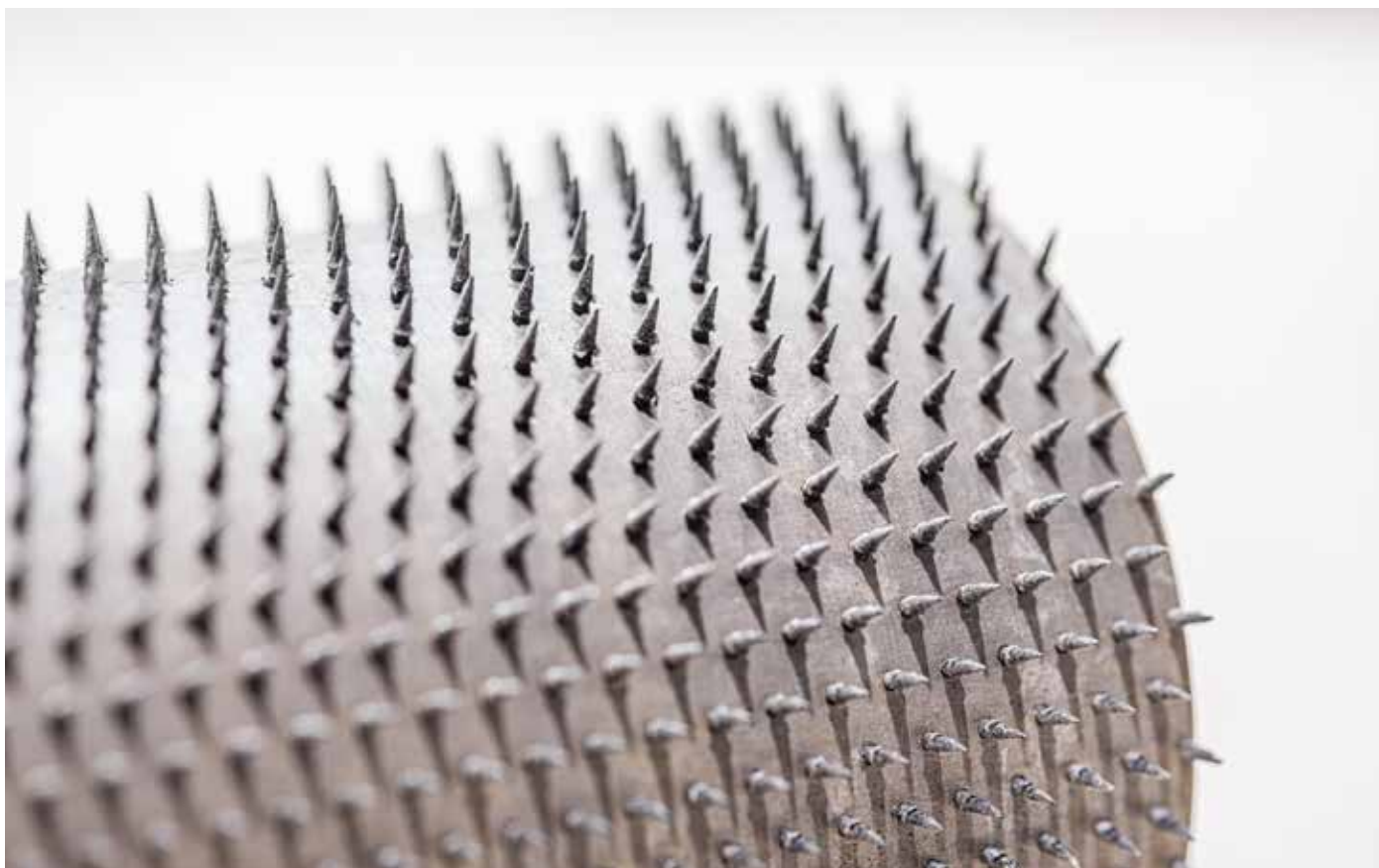
Pastries that are designed to be re-heated in their packaging, made from so-called ovenable films, present a particular challenge. The packaging must create enough of a barrier to prevent the product from spoiling, but it must also be vapour-permeable to ensure that the pastry does not go soggy when it is heated up, owing to the accumulation of steam.

Given all of these variables, it is not economical or technically feasible to produce a flexible film for each type of pastry product. It is far more cost-effective to produce families of films that can then be tailored to yield the desired rates of vapour transmission. In this manner, large quantities of film can be produced, and the film then can be tailored for the product to be packaged.

Hot-needle perforation

Hot-needle perforation is a precise and economical method for tailoring films to the individual requirements of a given pastry product. The process involves the passing of super-heated needles through the film to both penetrate and melt it in a predictable fashion. This results in holes that are consistent in both their size and shape, and, as they are reinforced by a neat, molten ring of material that surrounds them, they will not close. Hot-needle perforation is used in a wide variety of applications.

The sizes of the holes produced via hot-needle perforation typically range from 100 to 1500 μm , depending on the tooling and the substrate being perforated. Perforations can be made either across the full width of the roll or in defined lanes, in a variety of densities and patterns.





Many benefits

The process yields many benefits for the packaging of ovenable savoury pastry products. Its use enables the vapour transmission rate of the packaging to be tailored precisely to the nature of the product, enabling a perfect balance to be struck between length of shelf life and the desired crispness of the pastry.

It prevents ballooning, which is a common problem that occurs when a flexible film comes in to contact with hot air after a product has been sealed inside it. Air and other gasses captured inside the film cause it to inflate as it is heated. Perforations negate ballooning, as gasses can escape from the holes.

Hot-needle perforation also ensures that steam that would otherwise be trapped inside the packet does not fog-up the packaging film, ensuring that the product retains its aesthetic appeal as it is heated.

Finally, the tiny holes created in the film by hot-needle perforation allow for the scent of foods to reach the noses of consumers. This can be used to entice consumers to make a purchase that they might not otherwise have considered.

Two decades of experience

Terinex Flexibles is an expert in hot-needle perforation. In business for 20 years, we are a UK-based independent supplier of flexible packaging that specialises in the design and print of film-, paper- and foil-based products for the food, medical and pet food industries. Our customers are leading brand owners, food manufacturers, packaging designers and retailers.

Our state-of-the-art hot needle perforation line features digital computer controls and servo drives that ensure the precision of the holes, and the patterns, created. Potential pattern density can range from just one hole up to 1000 holes per square inch. We can perforate a wide range of films, including oriented polypropylene (OPP), polyethylene terephthalate (PET), polyethylene (PE) and laminates, depending on the needs of our customers. Our Q TEX heat resistant ovenable and microwaveable packaging films, for instance, demonstrate excellent thermal stability and high seal strength.

Our two decades of expertise in packaging materials, inks, label design and perforation means that we can work closely with our customers to create bespoke packaging for a wide variety of products quickly and efficiently. Indeed, we can often deliver prototypes within a week of receiving a brief.

Safety with certification

Crucially, our Q TEX film and inks are independently certified and compliant to Regulation (EU) 10/2011, Regulation (EC) No. 1935/2004 and Swiss national legislation (SR 817.023.21) when they are perforated and heated. We believe we were one of the first companies in the UK to have secured this approval for perforated, printed films.

Understandably, the food industry is subject to a lot of safety regulations regarding food-contact packaging and labelling. This regulation extends beyond food-safe substrates to the inks used in the process. Manufacturers of ovenable savoury pastries must ensure that the inks used in their packaging will not impact the quality, or safety, of their products.

Without proper care and attention, such inks can migrate to foodstuffs through the evaporation or condensation of moisture from the products themselves. This can cause ink particles to leach into the food from the outer packaging, which is why many food products are 'double wrapped' in an extra layer of plastic foil or wrapping.

Using a packaging supplier approved to EC1935/2004 provides peace of mind that such problems will never occur.

As we have seen, the packaging of ovenable savoury pastry products can be challenging to carry out correctly, but with hot-needle perforation and the expertise of our team at Terinex Flexibles, the ideal solutions can be found.



A leading supplier of printed flexible packaging films and solutions

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Sources:

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