

ISHIDA AND DEUTSCHE SEE CRACK THE TWO-FILLET CHALLENGE

Case Study
Deutsche See

Facts and figures

- » The timing hopper discharges each two-fillet weightment onto a flighted belt which takes it to the packing operatives. The accuracy with which the fillets are weighed has greatly reduced giveaway.
- » The grille structure of the discharge chute is just one of the measures that prevent the fresh fish from sticking as it passes through the weigher.
- » With its speed of 30 packs per minute, the new system can deliver up to nine tonnes of packaged fish per two-shift day.

At Deutsche See Fischmanufaktur, Germany's market leader in seafood, it's not long ago that the solution for the company's Gourmet range was static weighing by hand, with the worker having to make quick decisions as to which two fillets to allocate to a pack. It was slow, and also resulted in significant overweight.



Challenge

How do you tackle the tricky problem of accurately making fixed-weight packs from just two large fresh fish pieces per pack? This was the challenge Deutsche See handed to Ishida.

When a pack is to contain just two pieces of fish, keeping the overall weight close to the target weight is actually quite a demanding task. When it came to expensive fish species, such as salmon, cod and snapper, this giveaway was a real incentive to improve accuracy.

Solution

What was needed was a large number of accurately weighed fillets and the ability to choose rapidly between them in order to make near-perfect combinations: a classic task for multihead weighing.

Based in Bremerhaven, an important European port and centre of the fish processing industry, Deutsche See took the problem to Ishida, the company that invented the multihead weigher and has continued to pioneer the development of the technology into ever more challenging applications.

Ishida confirmed that classic multihead weighing, with bulk infeed and vibratory feeders, was not the answer. With a target weight per pack of 320g and piece weights after trimming varying between 155 and 175g, if even two pieces got into any one weighing hopper all hope of using the contents in an accurate weightment would be lost. Clearly, the major challenge was to ensure that, during weighing, no weigh hopper contains more than one fillet and that as few as possible are empty.



“ Ishida have been faithfully at our side all along. The technical support has been excellent. ”

An additional challenge was the difficulty of moving large pieces of fresh fish, a material that nature might have designed specifically to cling to metal surfaces, through the process of automatic weighing and packing.

The Ishida solution was to design a complete, integrated packing line based around a special 14-head screwfeeder weigher that uses rotating metal spirals to gently propel the sticky but fragile fillets into the pool hoppers. "Extensive tests were run to choose the screws best suited for handling our fish fillets" says Deutsche See Technical Manager Bernd Schröder.

The challenge of getting single fillets into as many weigh hoppers as possible, and preventing any weigh hopper from containing more than one fillet at a time was met by combining three different approaches. The first was to use a segmented conveyor (with operators placing one fillet in each compartment) to move the fillets to above the top of the weigher, ensuring that they arrive one at a time. From there, they fall into the second mechanism, a rotating funnel that deposits the fillets one at a time into the screwfeeder troughs.

The third is a load cell (weight sensor) in each of the pool hoppers. When the weigher senses that one fillet has arrived in a given pool hopper, it temporarily switches off the rotating screw in the corresponding trough until the pool hopper's contents have been passed either to a weigh hopper or to one of the booster hoppers ranged below the weigh hoppers.

The presence of 14 booster hoppers (hoppers that store product that has already been weighed) means that at each weighment the on-board computer has up to 28 different fillets to choose from, making it likely that a combination very close to the target weight will be found. Accuracy is further enhanced by Ishida's unique Anti Floor Vibration system, which samples ambient factory vibration and automatically adjusts the weigh signal to cancel it out.

The ascending conveyor is equipped with special drip trays to ensure that liquids and product fragments generated during processing do not enter the weigher. The geometry of the embossed metal surfaces onto which each fillet is dropped by the rotating funnel is designed so that each fillet arrives at the screw already moving in the same direction as the screw itself. This encourages a gentle, non-crushing forward motion towards the hoppers.

Passage of the fillets through the weigher is further helped by scraper gates on the hoppers. On discharge, the weighed fillets encounter not a continuous metal surface (to which they could stick) but instead a grille made up of rounded bars. Only parts of each fillet will be in contact with the surface, and the overall weight of the fillet is enough to ensure that any tendency to adhere is overcome by gravity. The fillets are collected in a timing hopper which enables complete weighments to be dropped into the same section of a short, segmented conveyor.

This delivers them to operators who place them by hand into thermoformed twin trays which are sealed under a modified atmosphere, labelled and deep frozen. The handy twin packs offer the consumer complete product visibility plus the choice of using the fillets either one or two at a time. With its speed of 30 packs per minute, the new system can deliver up to nine tonnes of packaged fish per two-shift day.

However, its outstanding benefit has been the reduction in giveaway, which has enabled it to pay for itself within two years of installation. "Ishida have been faithfully at our side all along", comments Bernd Schröder. "The technical support has been excellent."

Contact

Ishida Europe Limited

Tel: +44 121 607 7700
info@ishidaeurope.com

Kettles Wood Drive
Woodgate Business Park
Birmingham B32 3DB
United Kingdom



www.ishidaeurope.com