

Sorters redefined



Adding an automatic defect removal system, or ADR®, to its French fry line has been unbelievably good for business at Frigemo in Switzerland. The company is over the moon with the fact that the system has paid for itself within 12 months of usage and now Key Technology, the USA-based supplier of the equipment, is looking to the future and how the ADR system might eventually redefine the role of the sorter in potato processing.

There is snow on the mountain tops and the Swiss are gearing up for a spot of skiing as temperatures dip below freezing and drivers switch over from summer to winter tyres on their motor cars. Light snow is falling as we drive in the dark, on summer tyres, towards Cressier and, for me at any rate, a rare opportunity awaits to take a walk around a French fry production facility, seeing at first hand the process I have been writing about for just over two years.

Frigemo is part of the massive Fenaco group which dominates the Swiss agricultural sector and consists of over 80 business areas and subsidiaries. Frigemo is one of those subsidiaries. It produces French fries under licence for the Canadian French fry giant, McCain; and manufactures French fries for McDonald's outlets in Switzerland.

Raw material costs in Switzerland are high but the home-grown Eba potato variety is not ideal for French fry production, particularly after defect removal, so the

company imports the Innovator potato to make its fries.

Switzerland is a closed market for potatoes which means that processors like Frigemo have to pay punitive import duties. However, through the use of hi-tech sorting equipment supplied by USA-based Key Technology, along with an automatic defect removal system, also supplied by Key, Frigemo claims that it can maintain the required quality levels demanded by its customers while keeping wastage low.

Walking round a potato storage unit within the processing plant - Frigemo has a storage capacity on-



Quality control is crucial for processors.

site of 25,000 tonnes, including specialised organic storage - I saw at first hand the size of the Innovator potato. It is a large, long variety which easily lends itself to the production of French fries. The product is used to produce MacFries for McDonald's in Switzerland as well as potato wedges for the fast food giant. Frigemo also produces French fries for McCain and claims it is the only company in the world producing products for the Canadian multinational under licence.

The company also claims to operate the biggest potato processing plant in Switzerland, producing between 45,000 and 50,000 tonnes of product per

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The discharge end of the Optyx sorting system.

annum. It produces different kinds of French fries (deep-frozen and chilled) as well as potato flakes and specialities like hash browns and potato croquettes. Its key markets are the foodservice and retail industries within Switzerland.

From storage, potatoes are transported by water to the processing plant. The advantage of water transportation, claims Frigemo, is that the system washes the potatoes too. Potatoes are then size-graded (using a Tummers size grading system)

and then separated. The smaller products are used to make potato flakes and others are singled out for French fry production. The steam peeling system is used for potatoes being processed into French fries and potato flakes. Frigemo uses two steam peelers and three drum dryers for flakes and Unilever is a major customer.

"From storage, potatoes are transported by water to the processing plant. Water also washes the potatoes too, claims Frigemo."

Peeled potatoes are sent forward to a water cutting system where they are cut into strips for French fry production prior to mechanical and then optical sorting. After sorting they are sent through a Key ADR 4 system for defect removal and then over a perforated vibratory conveyor, also supplied by Key. The cut-out defects from the French fries fall through the holes in the Key vibratory conveyor and are processed into animal feed while the defect-free potato strips go forward for blanching, hot-air drying, frying, pre-cooling and then deep-freezing.



The Key Technology ADR 4 system.

Frigemo's entire French fry line is computer controlled and operated by just two people and the software for the system was developed locally to the plant.

It could be argued that by having two electronic sorters there is no need for an ADR 4, but Frigemo would beg to differ. The company claims that the ADR 4 has paid for itself within a year of installation. Prior to installing the ADR, rejected product from the sorters went directly to Frigemo's flake lines but now, the ADR cuts out defects from the defects, so to speak, reducing raw materials wastage - which is important when raw materials costs are high.

Where potato specialities are concerned, Frigemo has two dedicated production lines which, during our visit, were processing potato wedges for McDonald's, and potato croquettes which are produced from potato flakes.

Key Technology, the Walla Walla-based company in the North West Pacific state of Washington, USA, has been producing optical sorting equipment since 1982. According to Key's Tim Reardon, "When we developed the original ADR, quality control was done at the whole potato stage. Somebody had the idea to cut the potato into strips first and then chip out the defects from the strip."

Evolution

Tim said that the ADR system initially developed by Key evolved into the optical sorting equipment Key is known for today in the potato processing industry. "An ADR is like a sorter until you consider what to do about the defects. Sorters scan and eject the defective product whereas an ADR extends its own knife blades to cut out the defect," he said, adding that a vibratory conveyor system gets rid of the defects.

Frigemo's two sorters and one ADR 4 system appear to be doing the quality control job well, but Frigemo assures that final quality standards are met immediately prior to the packaging lines where somebody conducts a final quality control check of the French fries by hand.

Tim is of the opinion that sorting at pre-packing is a good idea; a final chance to ensure that the product being packed is in tip top condition and free from any form of contamination. The whole concept of sorting at the pre-pack stage, however, is subject to what Tim calls 'the inertia of the status quo', meaning that because it's uncommon, it's not currently being scrutinised by anybody other than the most forward-leaning, quality-conscious processors. "The real driver is food safety," Tim said, alluding to the potential for product contamination and the fact that processors are putting the reputation of their brand (or brands) on the line by not considering the risk factors involved throughout the production process.

While most quality control issues are addressed by upstream sorting equipment, Key Technology believes that there are exposed areas in processing plants where product quality can be compromised. Convincing processors that there is a very significant



Key Technology's Optyx in action.

cash payback involved in investing in additional sorting technology is, says Tim, hard. "There are few processors doing pre-pack sorting," he said.

Outside of Key's belief that sorting equipment can and should be used in a variety of locations along a French fry line, including the aforementioned pre-pack area, there is growing interest in the potential for ADRs to be utilised as the primary defect removal system. Such a notion could redefine the role of the sorter, possibly shifting its position as the primary sorting system in a French fry line and showcasing its value as a final checking mechanism at the pre-pack stage.

"Historically, processors couldn't rely on ADRs as primary defect removal systems because the early designs had dependability issues. These early models used water to throw the blade out to cut the defect," Tim said. The old water-based systems had problems with what Tim called 'water hammer' which caused inertia in the pipe and, inevitably, valve failure. In 1999, the development by Key of the ADR 4 and ADR 5 units put an end to the problem by relying upon air, not water, to throw out the blades in preparation for defect removal.

Now that the reliability issues of earlier ADRs have been resolved, Key is focusing on helping customers utilise the technology to its fullest capability, extending the value of the equipment to produce products more efficiently. ■