Headlines

- 1947-2017: Celebrating 70 years of sorting excellence and innovation in the food, agriculture and recycling industries.

Keynote

- Antonino Furfari – Enhancing recyclability of plastics

Plastics

- Addressing waste plastic’s growing environmental threat.
- STF Recycling: Delivering the best.

Fruit and Vegetables

- The frozen fruit and vegetable industry’s most hygienic optical sorter.
- Milani: The recipe for success.

Seeds

- Grupo Elayo: Helping to turn an olive by-product into a new super ingredient.
- Mogyi Kft: Hungary for more success.
- Weber: Sowing the seeds of success and growth.

Nuts

- SORTEX F: Rave reviews in Las Vegas.
- DeRuosi: Raising the bar for food safety and quality.

Grains

- Addressing food and feed safety risks through scientific research and partnerships.
- Bühler technology stars in BBC TV documentary.

Rice

- Safeguarding quality and increasing the value of Vietnamese rice.
- Innovating to save customers time and money.

Coffee

- What should coffee businesses expect from their sorting equipment?

Employee Focus

- Sara Larsen, Product Design Engineer; Engineering passion makes Total Sense!

Innovations for a better world.
1947-2017: Celebrating 70 years of sorting excellence and innovation in the food, agriculture and recycling industries.

Few business have such a rich and longstanding history of sorting excellence, with research & development in optics that has been so innovative... here are just a few highlights:

**Innovation milestones**

- **1947** – SORTEX Ltd established in East London. The SORTEX G1 is launched.
- **1950s** – SORTEX G2 and SORTEX G3 launched (able to sort smaller particles at higher capacities).
- **1960s** – SORTEX G4, SORTEX G5 and SORTEX 621, 711 and 714 launched (able to differentiate between light/dark shades and subtle colours).
- **1970s** – Development of the six-channel SORTEX 962 and SORTEX 1011FF (fully waterproof sorter).
- **1980s** – Launch of SORTEX 2020 (first dichromatic belt and/or chute-feed sorter), SORTEX 2027S and SORTEX 5000.
- **1990s** – Introduction of SORTEX 6000 (touch screen control, high performance, low cost, wide-belt sorter), SORTEX 8000 range (the world’s first fully automatic belt colour sorter) and SORTEX 9000 series.
- **1994** – Global technology solutions provider Bühler AG of Switzerland acquires SORTEX Ltd, later rebranded as Bühler SORTEX Ltd.
- **2000s** – The globally popular SORTEX Z (dry products), SORTEX K (wet products) launched and SORTEX E (dry and wet products)
- **2013** – SORTEX A and SORTEX B introduced (with MultiVision InGaAs inspection system capable of identifying defects not possible with RGB technologies).
- **2014** – SORTEX S UltraVision™ introduced (intelligent modes and automation enable outstanding productivity).
- **2015** – Launch of SORTEX BioVision™ technology for the nut industry. Its InGaAs detection technology can target hazardous material up to 50% smaller than previously possible.
- **2016** – SORTEX FA2 sorting platform and SORTEX PolarVision™ technology launched. Setting new industry standards for hygienic processing and FM-detection.
- **2016** – Launch of SORTEX PolyVision™ technology for the plastics industry. Able to identify same-colour polymer contaminants by analyzing their chemical signature.
- **2017** – Bühler SORTEX extends its hygienic sorting portfolio with the introduction of SORTEX FA1.
Revision of the EU Packaging and Packaging Waste Directives, Circular Economy Package and the Strategy on Plastics, on which the Commission is currently working, have put plastics recycling in the spotlight of the current heated debate surrounding plastics. Plastics recycling has been growing steadily over the past years and now there is a momentum that could give it a further push. In order to increase the collection of plastics, the recycling rates and the quality of recyclates, the sector has to be modernised through increased investments. Additionally, introduction of common standards and the creation of an EU market for waste would create an opportunity to harmonise and standardise practices across the industry.

Strategy on Plastics as well as the Directive on Packaging and Packaging Waste are necessary legislative measures which would boost plastics recycling. Design for recycling, minimum recycled content requirements and separate collection schemes, among others, will contribute to achieving higher recycling targets.

Great opportunity lies in the ban on plastic waste imports introduced by China. Valuable resources could finally be recycled in Europe. However, enhanced collection and sorting steps will be essential to recycle these tonnages in the EU. The Chinese ban is in fact a wakeup-call for Europe which needs to change its approach towards waste management. Firstly, because it cannot any longer get rid of unwanted waste and, secondly, because it needs to improve its waste management systems. Separate collection will ensure good quality of waste streams and therefore guarantee high quality of recyclates.

Finally, the first step in releasing the full potential of circular plastics lies in Design for Recycling. Reshaping the products that are put on the market will reduce costs, increase sorting efficiency and enable production of quality recyclates. With a turnover of more than €350 billion a year and a willingness to innovate, the EU plastics industry is well placed to come up with new solutions to enhance recyclability and to change the image of plastics.

It is important to emphasize that collaboration across the whole value chain including the production phase, waste collection, sorting, recycling, as well as end-use is vital in order to improve and drive plastics recycling forward.

**About Plastics Recyclers Europe**

Plastics Recyclers Europe (PRE) is an organization representing recycling and machine manufacturing companies from across Europe. It has over 20 years of experience in raising the voice of the recycling industry, at the EU level. PRE covers around 80% of the European plastic recycling Industry.
The frozen fruit and vegetable industry’s most hygienic optical sorter.

The pioneering hygienic design principles of the SORTEX F sorting platform helps to reduce the risk of food-borne illness.

Following several high-profile food contamination outbreaks, scrutiny of hygienic processing practices in the frozen fruit and vegetable sector has intensified. Bühler has addressed this challenge by developing the most hygienic optical sorter available, which will help reduce the risk of microbial contamination.

The SORTEX F optical sorter, with its innovative open access, for quick, easy and thorough cleaning, has been designed to help prevent the build-up of pathogenic bacteria that can induce food-borne diseases such as Salmonella, E. Coli, Listeria and Norovirus.

**Extensive analysis**

In researching the root causes of contamination, our experts carried out extensive analysis of food safety risks, based on product recalls in Europe and the USA. In most cases, the problem could be traced back to the accumulation of food within the machinery, particularly hollows, crevices and other areas with poor accessibility for cleaning.

Bühler Business Development Manager, Stephen Jacobs, explains: “Regular thorough cleaning of food-processing equipment is a key pre-requisite for maintaining hygiene standards. Our food safety team worked closely with institutions such as EHEDG and Campden BRI, to ensure that the SORTEX F met the highest possible hygiene specifications. This included testing machine materials for long-term robustness and design for trouble-free cleaning and maintenance.”

**Clean machine**

The SORTEX F features a pioneering retractable chute that can be repositioned to allow internal access, while sloped
surfaces ensure that all product residue runs off and the finish of all metal surfaces complies with the recommended requirement for safe food contact. Attention has been paid to the smallest details, with the SORTEX F representing an unrivalled convergence of innovations to improve hygiene standards in the food industry.

Jacobs added: “Overall, the hygienic design of the SORTEX F contributes to more consistent product quality, with less out-of-spec products, lower risk of spoilage, a better shelf life and therefore less waste. By helping to reduce risk of contamination, whether FM or bacterial, we’re making food safer and, ultimately, saving food and costs for our customers.”
Blåtand: Vision of exceptional quality, success and growth.

How investing in a SORTEX F optical sorter with PolarVision™ technology is boosting the success of a leading Swedish super berry product maker.

SORTEX optical sorting technology is helping world-class berry supplier Blåtand AB to maximise its berry processing efficiency, as it gears up for growth and expansion into new markets.

Blåtand’s handpicked organic wild berries include nutrient rich bilberries and lingonberries, a traditional Swedish staple. These health-boosting berries are increasingly in demand around the world, as consumers seek out their delicious flavour and nutrient-rich properties.

This leading international food company supplies high-quality frozen berries, jams and fruit preparations to caterers, restaurants, wholesalers and retailers. It prides itself on environmentally friendly, ethical production that meets the highest of standards “from forest to customer”.

“We work constantly on our quality control procedures, to ensure that the products we supply meet the highest quality standards. We need to ensure the separation of colour defects, such as brown berries as well as the removal of stones, sticks, leaves, pine needles and mud balls, which are collected from the forest floor as the berries are gathered.”

Ulf Hagner, Managing Director at Blåtand
Quality control
“We work constantly on our quality control procedures to ensure that our products meet the highest quality standards,” explained Ulf Hagner, Blåtand Managing Director. “We need to ensure the separation of colour defects, such as brown berries, as well as the removal of stones, sticks, leaves, pine needles and mud balls.”

Blåtand processes some 5,000 tonnes of berries on its 50-metre processing line, which is designed to handle delicate fruits without breakage. The addition of the SORTEX F optical sorter with PolarVision™ technology has enabled Blåtand to increase capacity and fulfill Hagner’s ambition to grow the business.

“Our goal was to create the best berry-cleaning process on the market, making it possible to produce a high-quality, class 1 product free from foreign material (FM). By combining the SORTEX F PolarVision™ optical sorter with our other cleaning equipment, we can now fulfill the requirements of the most demanding customers by supplying them with the highest quality frozen, cleaned berries.”

FM detection cameras
Zhanna Zhehet, area sales manager at Bühler Sweden, explained: “SORTEX PolarVision™ technology combines two dedicated FM detection cameras – the SORTEX PolarCam™ and high definition InGaAsHD, which remove difficult-to-detect defects and challenging FM. Importantly for Blåtand, SORTEX PolarVision™ is installed on the new SORTEX F optical sorter, which is hygienically-designed for zero tolerance of product build-up, so there’s a much lower risk of contamination. It also consumes less energy, in line with Blåtand’s environmental commitment.”

Hagner stressed that Bühler technology has helped Blåtand to increase the yield of its premium berries, boasting consistency in shape, flavour and colour – a hallmark of Blåtand quality, along with exceptional food safety.

He added: “Our complete high-tech facility paves the way for processing huge quantities of berries to produce a premium-quality product with exacting food safety standards. Now, with Bühler’s help, we’re confident of building our global customer base, while maintaining our unsurpassed reputation and product quality.”

Did you know?
Sweden’s vast forests are home to an abundance of bilberries, lingonberries and cloudberries, which thrive in the Scandinavian climate.
Bühler is working with an Italian premium food producer to help them meet the growing demand for semi-finished products for the food industry.

Verona-based Milani Foods prides itself on its unique blend of experimentation, tradition, innovation and craftsmanship to deliver the finest tailor-made vegetable creams, fillings and sauces to the exacting taste, expectations and demands of their customers. It turned to Bühler when demand for its authentic Italian products soared, while needing to meet growing market expectations of food safety and traceability.

Milani Foods used to buy in pre-sorted artichokes and mushrooms from Italy and overseas, so it could produce vegetable bases for sauces and pasta fillings. However, as sales rocketed, the producer soon realised that to increase production and maintain quality, it needed to source and sort the ingredients itself.

Exceptional products
Giorgio De Poli, Milani Foods Managing Director, explained: “We always choose the finest, natural, raw ingredients and add our own expert flair to create exceptional products made without preservatives or stabilizers. Every single Milani Foods speciality product is created with care and passion, to deliver the best flavours and nutritional goodness.”

The company chose SORTEX PolarVision™ technology to ensure its frozen mushrooms and diced, sliced and whole artichoke hearts did not contain foreign materials (FM). Since the company has been sorting all of its products, order volumes have increased, partially thanks to added customer trust.

SORTEX PolarVision™ technology serves up improved safety for Milani Foods.
De Poli concluded: “The smallest piece of FM can be highly damaging in food that is otherwise made to perfection. That’s why, when searching for our optical sorting equipment, we tested many different technologies. We found that Bühler’s SORTEX PolarVision™ was the most powerful and innovative system on the market, offering us unparalleled excellence and safety in our production line.”
Leading Spanish olive processor Grupo Elayo has established a first-class reputation, not only for its high quality olive oil, but also for developing new products and applications from olives.

Now, with our technology, Grupo Elayo is extracting seeds from inside olive pits, which contain up to 100 times more polyphenols and antioxidants than olive oil, as well as good-quality dietary fibre. They’re also believed to help reduce cholesterol and positively affect blood pressure.

Innovative new ingredients
Using the olive pits and seeds was the brainchild of Jose Maria Olmo Peinado, a mechanical engineer and business economist with 33 years’ olive industry experience. He founded Andalusia-based Grupo Elayo in 2012 with a plan to create innovative ingredients from the versatile olive.

“Previously, the olive pit and seed inside were discarded as waste,” he recalled. “But we’re developing new products based on the seeds that can be consumed raw or toasted as a snack, or used in energy bars or cookies in a similar way to pumpkin seeds.”

Peinado has also developed a procedure for extracting a highly concentrated oil from the seeds, which he says offers greater health benefits than conventional olive oil. “Small quantities can be used for cosmetics, functional foods or medical applications, such as therapy for joint pains or treatment of burns,” he explained.

Speed and efficiency
Peinado had invested in a processing line to clean, dry, crack open and sort the olive stones from the seeds, but sorting the seeds from the stones
was problematic because they were practically the same colour. So, he contacted Bühler, and our InGaAs camera technology was found to provide the solution.

“SORTEX technology makes us the only company in the world able to extract olive seeds successfully,” commented Peinado. “The technology’s speed and accuracy is also a key feature. Despite the high throughput rate of around 700kg of raw material per hour, minimal good seeds are lost, which is a crucial success factor. Overall, it takes 25 tonnes of olives to extract just 1,250kg of seeds.”

Ever the innovator, Peinado has since developed a way of using olive stone fragments to produce biomass for heating systems, fireplaces and barbeques. He can also grind them into a powder for use in cosmetic creams, while broken-up olive stones can even be used to make exceptionally robust and durable chipboard.

Did you know?
Andalucía produces a tenth of the world’s olive oil and a third of Spain’s total output.

Technology highlight

- Advanced Inspection System - Ultimate detection of all known defects and foreign material.
- PROfile™ Technology - Detects defects which are the same colour as the good product and foreign material. Sorts objects by size, colour and shape.
- Enhanced InGaAs Technology - Detects defects which cannot be seen in the visible spectrum, providing much better separation of good product from foreign material of the same colour.
SORTEX® technology is playing a key role in the success of one of Europe’s leading nut and seed snack processors, as it continues to expand in the private label sector with its own, widely recognised Mogyi brand and sub-brands.

Mogyi Kft attributes its growth to its ability to adapt to customer needs and maintain exemplary food safety standards, thanks to its Bühler SORTEX advanced processing technology.

**Export sales**
Headquartered in the Hungarian town of Csávoly, Mogyi Kft was launched in 1990, with just five staff and one small processing line. It now operates four production plants and eight subsidiary companies around Europe and sells to customers in more than 25 countries.

A major reason why Mogyi has been so successful has been its strict quality control systems and investment in cutting edge plant technology. Mogyi has used optical sorters for more than 20 years, but in 2013 it incorporated its first SORTEX optical sorter into its sunflower seed cleaning line.

This proved so successful that it installed another one in the same year, at its second sunflower seed cleaning plant. A year later it added a third sorter for popcorn and since then it has added two SORTEX B ColorVision™ optical sorters to its processing lines, as popcorn and decorticated pumpkin seeds production has boomed.

**Food safety priority**
Krisztián Weidinger, Mogyi Kft Procurement Manager, explained: “Our customers expect the
highest quality products, so food safety is a priority for us. Bühler tailored its sorters to our requirements, to deliver consistent sorted seed quality, while ensuring that contaminants, which were difficult to remove previously, disappeared from our end product.”

He said the company also chose Bühler because it needed technology that could easily be incorporated into existing processing lines. “Bühler ran trials for us at its London HQ to demonstrate the efficiency and accuracy of its optical sorters. The results on our samples of sunflower seeds exceeded our expectations, achieving a 99.8% accept quality”.

The products now sorted by Bühler machines are not only cleaner, but also have an improved yield and reduced waste.

Weidinger stressed the importance of its equipment suppliers reflecting its values and commitment to delivering exceptional service to its customers.

He added: “As our business continues to expand, we will require new solutions and flexible machine configurations to not only match our capacity, but also adapt to different products and contamination types. As we have found, Bühler technology can cope with these needs.”
SORTEX technology is helping a small, fifth-generation family business in Austria to grow and diversify. Seed specialist Weber is achieving better purity and yield by using our PROfile shape, colour and InGaAs technologies to sort a wide variety of agri and edible seeds, as well as superfoods, such as quinoa and white poppy seeds.

The Weber family has farmed land in Mühlviertel, Upper Austria, for more than 300 years. In 2000, Franz Weber decided to branch out from dairy farming, after recognising an opportunity to produce and sell grass seeds, which are difficult to clean and sort.

Reputation matters

In 2015, Franz’s son Emanuel took over the business and after comparing various optical sorting solutions, he chose SORTEX optical sorting technology to help reinforce Weber’s reputation as a leading, quality supplier and third-party processor for small farmers, agri-seed processors, spice traders and mixers.

Since then, Weber has diversified and now sorts more than 50 product types, including exotic herbs and spices. It has upgraded to a quick chute-change system for greater flexibility, better suited to sorting a wide range of produce.

Weber staff have recently received advanced training with Bühler’s technology specialists.

Emanuel Weber said: “Even though we were already using many of the sorter’s pre-programmed modes, we’re now confident we can fine-tune pre-
set modes or set up additional modes to run new products with unique applications.” This is key to the business’s diversification strategy.

SORTEX clean
Weber Seeds’ reputation is such that customers now refer to the purity and quality of its products as “SORTEX clean”. Weber added: “We’re delighted with our SORTEX sorter. It’s very easy to set up and operate, while the support offered by Bühler has been excellent. We can now give our customers the highest levels of assurance that the seeds we supply are of the highest quality. The optical sorter is proving to be 100% reliable.”

Johann Hoegler, Bühler Sales Engineer said the complexity of Weber Seeds’ operations posed a challenge, but one that Bühler SORTEX technology rose to with ease. “We invited Emanuel to watch one of our sorters in operation at another plant in Austria, where he could witness its accuracy and efficiency. Another critical issue for Emanuel was service; he wanted our engineers to be on-site quickly if there was ever an issue. Thankfully, in the two years since our machines were installed, Weber hasn’t once needed an engineer call-out.”

Did you know?
There are about 120 known varieties of quinoa. It’s called a “complete protein”, because contains all nine essential amino acids, which cannot be made by the body and therefore must come from food.
Addressing waste plastic’s growing environmental threat.

Bühler’s PET plastics sorting solution is helping to tackle increasing global waste, while enabling recyclers to increase yields by more than 30%.

Waste plastic remains an enormous challenge worldwide. Despite production continuing to increase – plastic production has increased 20-fold since 1964 – just 5% of waste plastic is recycled effectively.

To address this problem, our tailored PET recycling solution can improve yields by more than 30%. And a strategic partnership with US-based National Recovery Technologies, which specialises in bottle sorting, allows us to offer plastics recyclers a complete solution for plastic bottle and flake sorting.

**Highest possible yield**
Collecting and recycling PET plastic could reduce millions of tonnes of waste each year. Bühler is already a leader in the PET recycling industry, accounting for 25% of the recycled PET (rPET) recycled stream in Europe and approximately 10% of the global market.

Our innovative, two-machine process solution can deliver bottle-to-bottle grade rPET flakes at the highest possible market yield, offering superior sorting by color or chemical signature.

Bernhard Gabauer, Segment Development Manager for Plastics at Bühler, said: “Our new flake sorting technology enables our customers to recycle more plastic, more efficiently and to a higher grade.”

**Simply the best**
Global OEM and leading PET recycler STF recently switched to Bühler’s new process solution and increased its yield of bottle-to-bottle grade rPET flakes by more than 30%.
Josef Söllner, STF Managing Director, said: “We choose to use Bühler’s SORTEX technology because it’s the best flake sorter on the market. We undertook several industry trials to evaluate other technologies, but Bühler provided the best solution – first class machine results combined with impressive customer service.”

**Technology highlights**

- **SORTEX A ColorVision™** - advanced Inspection System uses three visible wavelengths, delivering a superior colour sort.
- **InGaAs and SmartEject technology** identify and remove challenging foreign material from clear, blue, green and jazz applications.
- **SORTEX E PolyVision™** uses transparent and reflective sorting to separate clear polymers from clear PET, based on chemical signatures.

**Did you know?**

According to a report by the World Economic Forum and the Ellen MacArthur Foundation, there will be more waste plastic in the sea than fish by 2050, if significant changes don’t take place.
STF Recycling GmbH, one of the largest recyclers in Europe, recently switched to Bühler’s two-machine solution - the SORTEX E PolyVision™ and SORTEX A ColorVision™ - to achieve a higher grade rPET for reuse in the bottle-to-bottle industry.

STF applauded Bühler for its flexible SORTEX system because it enables them to achieve higher value recyclate and profit margins, by accurately separating valuable rPET from baled material. It can do this regardless of its composition and contamination level, which can vary from as little as 5 percent to as much as 30 percent, from bale to bale, depending on the recycling practices of different countries.

**Winning industry praise**

Josef Söllner, STF Managing Director, commended Bühler for its ability to remove opaque defects and foreign materials that can devalue rPET, including metals from beverage cans, as well as bottles with multilayers, sleeves and labels from PVC, PS, PC and PET-G plastics.

Speaking about the solution, Mr Söllner said: “PET recycling is a very complex multistage process that requires efficiency at every point. Our ultimate aim is to continue to increase output quality, while at the same time minimising the loss of valuable and re-usable product in the reject stream. We undertook several industry trials to evaluate other technologies on the market but discovered that Bühler provided the best solution. First class machine results combined with impressive customer service and a commitment to ongoing development meant it was the only optical sorting solution for us. We highly recommend Bühler’s SORTEX® technology.”

STF Recycling: Delivering the best.

Global OEM and leading PET recycler STF improves yield of bottle-to-bottle grade rPET flakes, by more than 30 percent.
In September we proudly showcased the SORTEX F – the industry’s most hygienic optical sorting platform – at Pack Expo in Las Vegas, USA.

It provides hygienic design and high capacity performance for the nut and dried fruit processing industry. Available with Bühler’s SORTEX BioVision™ technology, it provides three-in-one detection of colour defects, shell and FM for exceptional product quality and food safety.

The SORTEX F features the industry’s most accessible and easy-to-clean frame. Its meticulous design helps to minimise the risk of physical and biological contamination, which can harm consumers and lead to damaging food product recalls.

Bühler’s Head of Optical Sorting, Charith Gunawardena, said; “The hygienic design of food processing equipment is one of the major prerequisites for the prevention of food contamination.

The SORTEX F helps to provide processors with protection from foodborne hazards and brings tangible benefits to food manufacturers and processors – it reduces the risk of contamination, maintains product quality and increases productivity.”
Our BioVision™ technology is capable of consistent, accurate sorting at twice the capacity of other industry solutions. It effortlessly removes hazardous material up to 50% smaller than previously possible when processing almonds, pistachios, pecans, walnuts and hazelnuts. This is made possible by proprietary technology that targets the spectral and spatial difference between nut meats and shell – however subtle. For example, BioVision™ technology can tell the differences between pale shells and paler varieties of almonds in a single sort, minimising losses of good nuts, which wasn’t previously possible.

**Unique benefits**
The Minturn Nut Company is one user that is enjoying the unique benefits that BioVision™ technology provides. The California-based business has processed brown-skinned almonds since 1996 and it supplies markets all over the world, shipping approximately 75% of its 40,000-tonne crop overseas each year.

It chose Bühler’s BioVision™ technology to improve food safety, traceability and eliminate foreign materials (FM). Adam Salwasser, Director of Operations said: “We were looking for increased resolution, ejector spacing and overall accuracy of our process from new colour sorters. One of the advantages of SORTEX BioVision™ technology for us is that it takes different spectrums of light and looks at almond kernels in a way not possible before.

**Competitive advantage**
“SORTEX BioVision™ combines high-definition, infrared and shape technology, as well as custom-built bichromatic cameras. We knew that if we approached our sorting process with all three technologies,
we’d get the product we really wanted and set ourselves apart from our competitors, sorting faster and more accurately than anyone else. We want to be the best in our industry, not only at FM removal, but also serious defect and split/broken kernel eradication.”

**Collaboration and innovation**
Charith Gunawardena, Head of Optical Sorting at Bühler SORTEX, said:

“By developing new solutions and building our knowledge, through collaboration and innovation with food processors and leading scientists, we’re helping our customers produce safe food, reduce waste and comply with legal requirements, to maintain the trust of their consumers.

“The SORTEX F with BioVision™ technology is the best all-in-one nut processing solution for the industry today. It’s easy to operate, while offering unprecedented performance and accuracy, safely delivering the quality and food safety standards businesses need”.

![Minturn Nut Company Inc.](image1)

![Almonds](image2)
DeRuosi: Raising the bar for food safety and quality.

BioVision™ technology enables walnut processor to meet stringent quality demands.

Leading US walnut processor DeRuosi Nut is using our BioVision™ technology to meet growing global demand for high-quality walnuts, with owner Mike DeRuosi describing BioVision™ technology as “the perfect sorting solution”.

He explained: “It takes care of all the different challenges we have in processing walnuts, including the ability to move larger volumes in a shorter period. And when fitted to our SORTEX E optical sorting platform, it’s nice and compact. It’s really upped the bar for us on food safety and the overall quality of our product.”

Return on investment
The California-based company, which processes about 25,000 tonnes of walnuts a year, is now benefitting from its decision to invest in BioVision™ technology to help resolve its processing challenges with foreign material (FM) and different-coloured kernels.

DeRuosi Nut processes a range of both in-shell and shelled walnuts. Established in 1947, more recently it has faced ever more stringent quality demands from customers, particularly for walnut kernels, which must be free from FM and consistently light in colour.

DeRuosi has described the support his business has received from Bühler as “amazing”. He explained: “We haven’t needed a lot of help, because the machine takes care of itself – we just ‘set it and forget”
it’ – which is one of the things we love about it. But whenever we have a question, the Bühler team is very accessible, so it’s been a great partnership. I’d definitely recommend SORTEX BioVision™ technology to anyone who doesn’t have it yet.”

Bühler’s Area Sales Manager, Rio Rafael, commented: “Working with DeRuosi, we designed a solution that incorporated our BioVision™ technology into two optical sorters and we’re proud to say it’s been an enormous success in reducing FM and defects in their end products.”

Did you know?
With demand driven by more widely perceived health benefits of walnuts, global production rose from about 900,000 tonnes in 2005 to nearly 1.5 million tonnes in 2015.
Mycotoxins are poisonous chemical compounds produced by fungi that pose a growing threat to the health of people and animals. Food and feed producers must ensure that maximum mycotoxin tolerance levels aren’t exceeded. But with the necessary cleaning and sorting processes, producers can meet their regulatory obligations, while maintaining their margins.

“Ultimately, it’s the prevention and reliable removal of mycotoxins, as early as possible in the value chain, that ensures the safety of foodstuffs,” explained Matthias Graeber, expert in mycotoxin reduction and data analytics within Bühler’s Corporate Technology Group.

**Investing in R&D**

“Finding solutions to food and feed safety issues is critical to Bühler,” he stressed. “The company invests roughly 5% of its turnover in R&D every year – creating breakthrough technologies and market-specific solutions to help our customers achieve long-term commercial success, despite growing regulatory requirements and regardless of incoming product quality.”

Moreover, Bühler has partnered with various scientific and applied research organisations for many years, to learn more about the value of integrating cleaning measures along the value chain. One such collaboration is with experts from the European Horizon 2020 project, MycoKey, which was initiated in mid-2016 to develop solutions for reducing major mycotoxins in economically important food and feed chains.

“This €6.4 million project has partners from 32 organisations from 14 countries in Europe, Asia and Africa,” explained Graeber. “Together with Bühler and some of our customers, MycoKey has run multiple large-scale field tests, to collect valuable data on the performance of grain-cleaning solutions.”

**Rye mill studies**

Other recent research looked at ergot alkaloids (EAs). Graeber added: “To support our industrial milling customers, we initiated a study carried out at two German rye mills to establish how the level of EAs can be influenced by grain-cleaning and milling processes. The study was carried out by Bühler and two industrial partners – a large milling group and an independent food safety laboratory – applying official EU sampling guidelines.

“By far the highest EA reduction could be obtained by optical sorting,” Graeber highlighted. “This confirms the central importance of optical sorting in the rye supply chain, at grain reception facilities and mills.”
Recent BBC 2 documentary series, Inside the Factory: How our Favourite Foods are Made, took a look behind the scenes of the world’s largest dried pasta factory in Parma, Italy, owned by the Barilla Group – which has been a Bühler customer for over 50 years.

Hosted by Greg Wallace and Cherry Healey, the programme reveals details of the groundbreaking Bühler technology and processes that enable Barilla to mill 900 tonnes of wheat grains per day. Viewers were given an insight into the extensive quality control checks that each grain of wheat undergoes before being sent to the mill, with optical sorting just one of the Bühler processes highlighted. Kernels were seen being checked by the London-made SORTEX optical sorter.

**Pasta masterclass**

As Gianluca Allodi, Durum Wheat Mills Director, Barilla, explained, the company’s optical sorter works at a rate of 34,000 kernels per second, identifying damaged or discoloured kernels and ejecting them with nothing more than a puff of air, which amazed presenter Greg Wallace.

Stefano Bonacina from Bühler commented: “We’re delighted to be featured on Inside the Factory alongside Barilla, who have been a valued customer of ours for more than 50 years. Barilla uses our technology to make more than 100 types of pasta at their plant and we look forward to continuing our successful working relationship for many more years.”
Our technology is powering the success of Vietnam’s biggest processor of Jasmine, Japonica and ST21 fragrant rice. Phung Hoang Rice Mills recent investment – a fully automated, energy-efficient, 24/7 Bühler plant – enables the business to increase total daily production to 1,200 tonnes of premium quality, Phung Hoang-branded rice.

It is now able to export to customers in Europe and the Middle East, with plans just announced to further extend Phung Hoang Rice’s processing business in 2018, with the introduction of a fourth Bühler-equipped plant.

Phung Hoang Rice’s investment in premium milling technology is also helping to raise the profile and value of Vietnam’s high-quality rice.

**High-quality processing**

Rice quality can vary drastically depending on the methods and machines used to process it. Quality issues can vary from kernel breakages to weevil infestations. But by implementing proven, high-quality processing technology, Phung Hoang can ensure the high quality of Vietnam’s rice varieties.

Hồng Thị Bích Tuyền, CEO of Phung Hoang Rice, said: “I want Vietnam to produce the world’s best rice. But the image of the rice Vietnam exports is not what it should be, mainly because of outdated technology, which doesn’t take food safety needs into account, nor allow rice producers to control their mills to achieve the highest efficiency and the best, consistent rice quality,” she explained.

Phung Hoang Rice’s newest rice plant, the company’s third operation in the Mekong Delta (Vietnam’s largest rice-growing region), can handle 400 tonnes per day of wet paddy and turning it into, high-value, bagged rice for export.
Equipped for success
This top level integral solution includes conveying, reception and handling of the still moist, unhulled and often dirty paddy rice, to cleaning, drying, hulling, polishing, sorting, packing and dispatch to the harbour.

Bích Tuyên said the plant has four SORTEX S UltraVision™ lines, widely regarded as the most technologically advanced, energy-efficient range available for rice sorting. They can optically assess each rice kernel for discolouration or damage at a rate of 20 million kernels per minute, with 250 data points and an outstanding hit rate.

“This has enabled us to meet a quality level previously unknown in Vietnam and, as contaminated kernels are systemically removed from the food chain, we can now guarantee the highest level of food safety standards.”

Delivering on promises
Phung Hoàng Rice was extremely pleased with the speed of the installation, which began in mid-November 2016 and, crucially, was finished and ready for production to meet additional demand that comes with the first day of TET (Vietnam’s New Year) in February 2017. Bích Tuyên said: “If we’d failed to start up the plant by then, we’d have been behind for the whole business year.” She added: “I’ve seen the Bühler effect. Bühler is central to our business and how we will develop it in the future, because they deliver on what they promise – enabling us to consistently deliver safe, high-quality rice.”

Did you know?
Vietnam produces 45 million tonnes of rice a year, exporting seven million tonnes of that volume, making it the world’s third largest rice exporter.
The Bühler Group has introduced a game-changing new digital rice analysing system called TotalSense™, which has been created to save time, increase yield and improve quality for rice processors.

This recent innovation is part of Bühler’s digitalisation strategy, which has led to various new solutions that leverage the power of the Internet of Things (IoT). The IoT is the network of physical devices and other items embedded with electronics, software, sensors, actuators and network connectivity that enables them to connect to each other and exchange data.

**Time and cost savings**
Bühler is implementing its digitalisation strategy to lead the industry and create innovative solutions that deliver greater value for our customers. “We’re positioning ourselves at the forefront of this accelerated transformation. Digitalisation can bring consumers and producers closer together and increases performance, efficiency and quality” said Stefan Scheiber, Bühler Group CEO.

Many rice processors still manually measure and inspect rice grains, a process that can be slow, subjective and prone to errors. TotalSense™ enables rice processors to use their mobile phones and the TotalSense™ app to take images of rice samples, send them for analysis via cloud technology and the IoT, then within minutes receive back objective analysis. As a result, rice processors can save time and money by effectively using an early warning system that prevents the contamination of entire batches.

**Remote control**
Previously, we launched the TotalCare™ AnywarePro online platform, which analyses, filters and transmits critical data about sorting machine performance,
tolerance levels and sorting criteria in real time through remote access. As a result, engineers and machine operators could carry out maintenance and therefore reduce downtime, delivering significant cost savings.

“These innovations are the beginning,” says Ian Roberts, CTO of the Bühler Group. “We are investing considerable resources in developing digital services. We partner up with start-ups, researchers, institutes, and customers in order to bring relevant innovation to our customers.”
What type of business are buying coffee sorting equipment?

Christophe Parrot (CP): “Traditionally, coffee sorters have been bought by large exporters of green coffee but with the rise of specialist coffees worldwide, farmers and cooperatives, in producing countries, are wanting to invest in coffee sorters, so they can sell their produce directly to buyers in Europe, the USA and Japan. In consuming countries, roasters are also investing so that they can remove foreign materials and under or over roasted coffee beans, to improve quality.”

What mistakes do some coffee companies make when it comes to buying sorting equipment?

CP: “Traditionally, many have considered sorting equipment from only one perspective, cleaning efficiency. In other words – how clean will the coffee be after going through the sorter? This is determined by the type and amount of foreign material [FM] and defects removed, but it ignores other fundamental considerations.”

Such as?

CP: “A good example is the average throughput to reach the required accept quality. In the coffee sector, low-tech sorters can require two, three or even four passes before reaching the required accept quality. As the defects become more subtle, such as small broca or yellowish beans, the number of passes needed will increase.”

OK, so accept quality is crucial consideration but what about the final reject ratio?

CP: “This is probably the most important factor after accept quality. The question here is how many good beans must be sacrificed to remove the defective ones. An average sorter will allow...”
greater losses of good beans to enter the reject stream. And the more subtle the defects, the more likely that additional good beans will be lost in the process.”

Are there any other key considerations?

CP: “Yes, stability of the sort over time should be major consideration. This relates to the performance of the sorter. So for instance, will a sorter be more or less stable when there’s a shift in the average shade of the incoming product, or when the temperature or light around the sorter changes? The answer will depend on the quality of the sorting algorithms, lighting and detection systems. If the sorter is less stable, its sorting performance will drift overtime, resulting in more bad beans in the accept stream and/or more good beans in the reject bin. A low-tech sorter will require more operator intervention to keep it in the required operating range.”

The price of sorters can vary dramatically. It must be tempting to buy a cheaper option?

CP: Of course but cheaper sorter components are likely to result in more failures and down time. Ownership costs need to be well-thought-out and include replacement parts, frequency of failure, as well as servicing costs.

How important is after-sales service?

CP: “Very. Optical sorters are highly specialized with sophisticated technology, so a technical failure usually requires a visit from a qualified service engineer. Minimising downtime will depend on how quickly an engineer can get to your site, so it is worth checking the availability and proximity of service engineers – the closer the better.”

What cutting-edge technological advancements are available for achieving greater efficiency?

CP: “Greater efficiency in removing foreign materials, such as wood, plastic, glass, insects and, in particular, stones which can damage grinding equipment, can be optimised by using InGaAs technology, which relies on differences in infrared reflectivity to separate good beans from FM. Not only is this important for protecting grinding equipment and controlling quality but also to enhance food safety, a growing concern nowadays.”
How did you realise that you wanted to be an engineer?

Sara Larsen (SL): “I think it all started when I was a kid - I really enjoyed taking things apart to find out how they worked. Plus I have always liked physics, maths, design and being creative. So when the time came to find a university degree, I focused on what I have always been interested in. That’s why I chose to study Product Design Engineering, and I can say I am absolutely delighted with my decision.”

You grew up in Sweden – what made you come to England?

SL: “I came to study Product Design Engineering at Loughborough University. It gave me a good understanding of product development, from the early concept to the launching phase.”

How did you hear about Bühler?

SL: “While studying for my degree, I was given the opportunity to work on a project with a company that sponsored UNITECH International… and that happened to be Bühler! The topic was very interesting – food safety and famine relief – a huge challenge and not something I’d previously thought about in an engineering context.”

Is that why you choose to apply for your internship with Bühler?

SL: “Yes - I learned so much while working with them. Plus I liked that they use technology and engineering to improve the world and help people. I was also inspired by the Bühler case advisors I met, which gave me a good insight into the company’s culture. For me, that’s just as important as the role itself.”

What was your internship project?

SL: “I worked on the development of TotalSense, an ‘Internet of Things’ (IoT) product, designed to analyse the quality of rice, in an efficient and objective way.”

What did you learn that you wanted in your role in this project?

SL: “I brought all the work together, with a focus on developing the box and the analysis, while also gaining customer feedback. After initial UK tests, we travelled to India for road tests with processors.”

What did the road tests involve?

SL: “We spent time with quality analysts, in their labs to understand their requirements and see how TotalSense compared to the processes they follow on a daily basis. We discussed what they looked for when analysing the rice samples to make sure we were able to meet their requirements.”

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Was this your idea?

SL: “No, the idea of using a smartphone to analyse rice, to a high standard, had already been proposed. The proof of concept and much of the validation had already been completed before I joined the team.”

So what was your role in this project?

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The general reaction was that it is a great concept that could make the analysis process a lot more
efficient, as it could not only save time but increasing yield and improve overall quality.”

**TotalSense™ has won a company award?**

SL: “Yes, it was voted best digital business solution. Eight projects were presented at our head office in Switzerland, to 100 Bühler leaders, including our CEO and executive board members. We had already demonstrated TotalSense™ in London, but only in a meeting room to a few people, so this was very different, because there were many people and all very senior. We had to give a presentation and then answer questions.

Then everyone there voted via a smartphone app for the project they believed would bring more value to Bühler and our customers. I was nervous, but I really enjoyed it.”

**You must have been delighted to win?**

SL: “Absolutely, it was a great feeling to receive recognition for all the hard work that everyone involved had put into the project.”

**How do you feel following your success? What comes next?**

SL: “It feels great to have such recognition for the project, and to see that our customers believe in what we are doing.”

I have thoroughly enjoyed being part of the TotalSense project and am super excited because we have just launched it. And this is just the beginning - an IoT product like this will continue evolving, as we get more customers and tailor the product to their specific needs. So I am looking forward to continuing my work with our superb customers and the great team here at Bühler.”