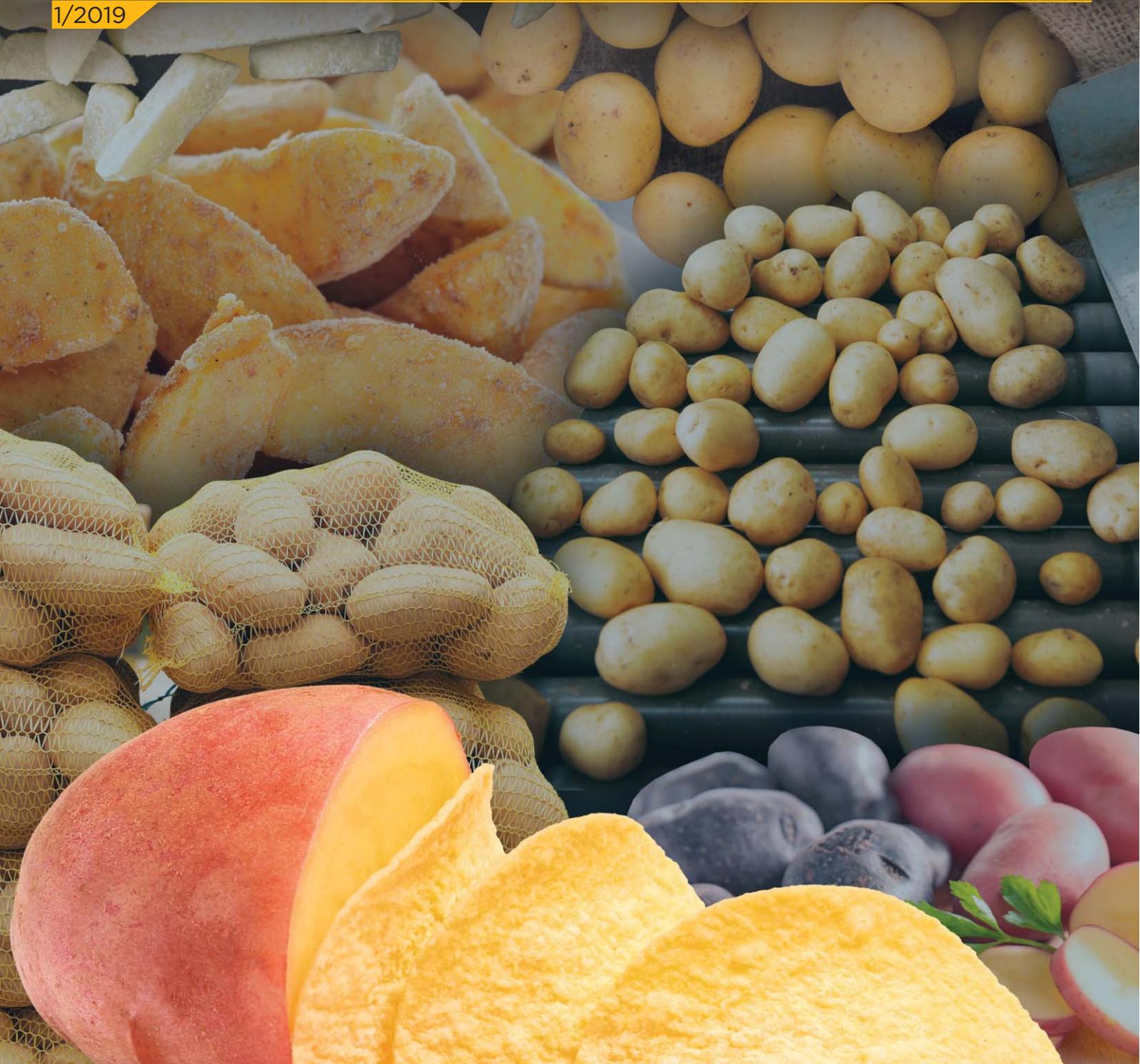


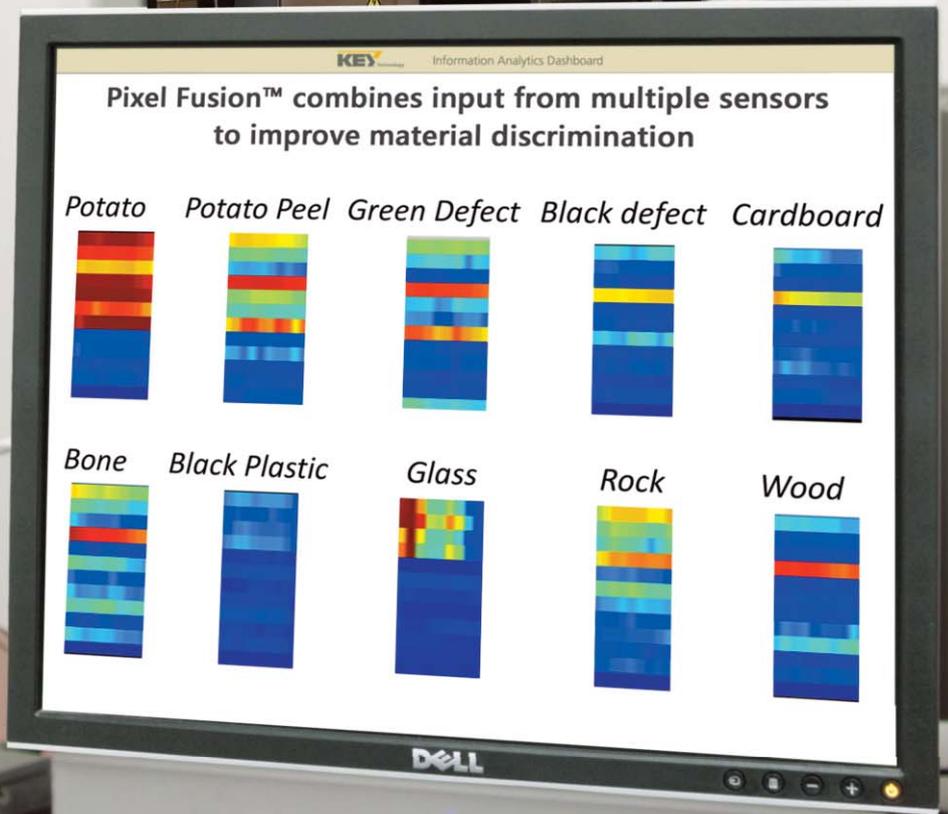
POTATO BUSINESS DOSSIER

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INNOVATIVE EQUIPMENT

Changes the Face of the Industry



The Expanded Role of Digital Sorters - The State of the Industry in 2019

With all the big technological advances transforming digital sorting and sweeping the industry, potato processors turning to state-of-the-art systems are enjoying a range of competitive advantages. Featuring reimagined mechanical architectures, next-generation smart sensor technology, powerful new software algorithms and more, today's sophisticated sorters are delivering important new capabilities and establishing new standards of performance. They are also enabling the exciting data revolution taking hold in processing plants around the world.

by **Louis Vintro**, senior vice president of New Products & Business Development, Key Technology

Removing more foreign material (FM) as well as the right amount of defects to make grade with minimal false rejects enables processors to optimize their product quality and maximize yield. At the same time, greater automation is minimizing the need for labor and improved ease-of-use is reducing training requirements. Superior sanitation, simplified maintenance, greater operational efficiencies and lower cost of ownership further differentiate contemporary sorters from legacy equipment. While these advances will continue to provide significant value for potato processors, sorters also powered by data collection and analysis software and data connectivity will play a greater role as information centers in support of plant control systems.

MORE COMPREHENSIVE PRODUCT SURFACE INSPECTION

Suppliers of belt-fed sorters have positioned cameras and laser sensors above and below the product stream for decades but failed to sustainably achieve all-sided surface inspection for processors of potato strips and specialty products – until now. The challenge comes from wet product that splashes its starchy residue on sensor windows below the product stream, which obstructs those sensors from viewing. The solution is a unique mechanical architecture that locates bottom-mounted sensors, along with light sources and backgrounds, strategically away from product splatter. With its radical design that keeps these surfaces clean, Key's VERYX family of

sorters can be configured to achieve in-air top and bottom viewing sustainably throughout the longest production cycles in the most demanding high-volume production environments. All surfaces of the product are inspected fully and accurately even after weeks of continuous operation, enabling VERYX to detect and sort out more defects and FM while providing the most comprehensive set of data.

SMARTER SENSOR TECHNOLOGY

Beyond today's 4-channel cameras and laser sensors that offer twice the resolution of previous generation sensors to detect smaller defects and FM, one of the biggest advancements in sensor technology comes from multi-sensor Pixel Fusion. This powerful detection capability combines pixel-level input from multiple cameras and laser sensors to produce higher contrasts and thus greater distinctions between each type of FM and defect as well as good product. Sorters equipped with Pixel Fusion find and remove the most difficult-to-detect FM and defects without 'false positives.' Additionally, Pixel Fusion-equipped sorters better classify various FM types for the purpose of triggering supplemental control systems like FMAAlert if a specific, user-defined FM type, such as glass, is detected. This high degree of control adds the most value whenever the tolerance for FM is extremely tight, such as inspecting final product quality immediately prior to packaging.

MORE EFFICIENT CONTROL OF CUSTOMER GRADE

Ultimately, the objective of every digital sorter is to enable the processor to make

grade while maximizing yield, and no single software development achieves these competing goals better than Sort-to-Grade (STG) for potato strips. While continuing to target every piece of FM for removal, the STG software makes extremely intelligent accept/reject decisions for defects. Unlike traditional sorters that 'see' defects and make a series of one-off decisions about each incoming object, an STG-equipped sorter makes each accept/reject decision based on how it will impact the output – perfectly producing the aggregate 'in the bag' grade, as defined by the user, regardless of fluctuations in incoming product quality.

STG can be programmed to categorize every surface defect based on various severities and the dimensional characteristics of each individual strip based on the ideal length distribution profile of the grade, so the sorter rejects exactly what's needed to make grade and no more. Making extremely sophisticated yield optimization calculations in microseconds, STG accurately delivers the most complex final product specifications without operator intervention while increasing yields by as much as 1-3%.

Rejecting strips that are too short and/or too long for the grade, while managing the distribution of strip lengths within multiple user-defined length categories between those two absolutes, has game-changing implications. It enables a frozen strip sorter to eliminate traditional mechanical length grading equipment, freeing up floor space and reducing both maintenance and sanitation. Furthermore, using a digital sorter to length grade adds enormous operational versatility since the sort parameters can be instantly managed on the user interface with no mechanical adjustments or change parts.

GREATER ROLE IN THE PLANT WITH INFORMATION ANALYTICS

While the primary purpose of every digital sorter has always been inspecting product to find and remove FM and defects, potato processors around the world are increasingly tapping into sorting technology to also collect, analyze and share big data across their enterprise. Recent advances have made

this easier than before. Equipped with powerful 'Information Analytics' software, a sorter is able to reveal patterns, trends and associations to the plant at the same time that it continues to sort product at the highest capacities.

Highly customizable and ever expanding, specific product data categories of interest can be identified by plant operators among all the available real-time data about the sort process and about each and every object flowing through the sorter, whether the data is used to make sort decisions or not.

Increasingly, by analyzing the information and generating useful reports, raw data becomes knowledge that is harnessed to better manage incoming raw materials and optimize processes upstream and downstream of the sorter to achieve the next level in operational efficiency in potato processing. Data-driven decision-making and implementation of industry 4.0 methodologies in plants has also become easier with universal connectivity via an OPCUA-compliant infrastructure, which seamlessly integrates with virtually any factory automation system. Similarly, modern sorters can leverage the Industrial Internet of Things (IIoT) to facilitate remote management via a secure portal. Enabling the sorter to be monitored and controlled by personnel off the plant floor, including off-site management and the sorter's supplier, helps increase uptime, improve performance and extend equipment life.

IN SUMMARY

For potato processors that want to maximize food safety and optimize product quality while increasing yields and improving operational efficiencies, the newest digital sorting technology delivers. Sorters are increasingly enabling potato-processing plants to reach toward the next level of efficiency through continual advances in sorting technology as well as by expanding their role as information centers that support new approaches in data-driven decision making for the plant. The competitive advantages won by early adopters then fuel others to race to catch up, creating a never-ending pursuit to advance. ■