Fruit and Vegetable Optical Sorting.
Bühler is a leading global supplier of optical sorting solutions to the food and non-food processing industries and has been at the forefront of optical sorting technology for over 65 years.

Bühler’s commitment to substantial investment in research and development ensures that its advanced optical sorting technology produces excellent results in removing even the most challenging defects and foreign materials.

**Key benefits**
- Maximum efficiency with high precision and flexible sorting
- Reliability and consistency for increased profitability
- Ultimate product quality and safety
- Lower operational costs

**Processing lines**
Bühler offers processors of fresh and frozen fruit and vegetables, the greatest possible flexibility in placing sorters at almost any point in the processing line. Depending on individual requirements, this could be at any stage, with the product unblanched, blanched or frozen.

**Before Blanching**
The sorter is used to optimise the removal of colour defects while removing extraneous vegetable matter (EVM) and field foreign material (FM). Before blanching, the product is washed and air cleaned using little energy and processing costs. The cost of any good product rejected is also low. If there is a high input contamination, early removal of the contaminants will allow better use of the downstream blancher and freezer tunnel, so higher line capacities can be achieved.

**After Blanching**
Some colour defects are enhanced from the blanching process and are therefore easier for the sorter to detect and remove. Other minor colour defects, such as khaki peas and green discoloration in carrots, are often reduced after the blanching process. Bühler recommends sorting before blanching, reducing the risk of microbiological contamination prior to freezing.
Fruit and vegetable sorting lines sort commodities ready for supply. The process outputs are the marketable commodity whilst the inputs are good products, soils, sub-standard product and foreign material.

After IQF (Individually Quick Frozen)

In the frozen state the sorter detects and removes the more subtle colour defects in unison with the high precision of profile recognition (shape). The sorters unique chute feed system has no moving parts achieving an evenly controlled product flow.

The sorter is also perfectly suited for bulk to bulk cleaning processes for the removal of missed EVM, field FM and packaging FM.

In the Packing Line

At the final stage of the process, packaging FM such as wood, plastic and cardboard can enter the product stream. To enable a simplified operation, Bühler’s optics package, enhanced with InGaAs technology is optimised to detect these FM with the use of just one set-up. The product can also be further improved with additional colour and shape sorting to ensure the highest level of quality.
Bühler provides optical sorting solutions for fruit and vegetable processors who demand the highest standards of product quality with a focus on efficiency, profitability and food safety.

**Maximum efficiency with high precision and flexible sorting.**
- Advanced technologies handle applications where gross and subtle colour defects and EVM need to be removed
- A combination of multiple shape parameters can be used to remove stems and under or oversized products at the same time
- Combination of high resolution Camera technology, Broad Spectrum lighting and InGaAs HD technology offers accurate detection and minimum product loss

**Reliability and high capacity for increased profitability.**
- Removes defects with high yield and minimal loss of good product in the reject
- Customised ejector design for long life, high speed, high reliability and high flow
- Advanced feed, vision and ejection technologies allowing separation of touching objects provide high capacity sorting

**Ultimate product quality and safety.**
- Equipped with intelligent features, the SORTEX range optical sorters minimises product damage
- Meets high-level market demands in product quality and safety
- Hygienic open frame stainless steel design

**Lower operational costs.**
- Low running costs with low power consumption and single phase supply
- Easy access to all enclosures makes maintenance quick and easy, reducing serviceability costs
- Continuous operation with no daily calibration required increases production time
- SORTEX ProSortX™ simplifies a wealth of configurable options with unmatched processing speed, minimising the need for operator intervention
Precision sorting.
Technology leadership in fruit and vegetable sorting.

Bühler’s range of optical sorting equipment removes unwanted gross and subtle colour defects, EVM such as pods, stalks, sticks, stems, and foreign material (FM) such as insects, stones, wood, cardboard and plastics.

**Examples**

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<tr>
<th>Accept</th>
<th>Reject</th>
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<tbody>
<tr>
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**Diced carrots**
Major and minor colour defects (black and green) and foreign material, such as insects, stones, wood, plastic, cardboard, peel tops and leaves.

**Peas**
Colour defects including removal of small brown spots and blond peas, foreign material, EVM including pods, insects, snails, flower heads can be removed with no need to adjust the machine for each load.

**Mixed frozen vegetables**
Excellent results in removing packaging FM (wood, cardboard and plastic) and any missed EVM from the process ensuring top quality product prior to packing.

**Raspberries**
Mold, unripe attached stem, stems, sticks, sunburn cells and packaging material can be removed with gentle handling through the sorter.
Enhanced SORTEX K2A/K2P. 
Ultimate product quality in your process line.

The SORTEX K range uses leading edge technology to deliver effective solutions to processors in the freezing, canning and fresh industries.

The sorter is able to inspect product in a blanched, unblanched or frozen state. Its PROfile™ technology enables clear detection of EVM by measuring multiple shape features. Enhanced InGaAs cameras can be added for FM detection in bulk-to-bulk and packing lines.

- 12.1 inch user-friendly touch screen interface
- Bichromatic visible cameras
- High definition InGaAs technology
- PROfile™ technology
- Pre-set sorting modes
- External USB port for data retrieval
High capacity and performance.
K2A/K2P benefits.

Empowered consistent performance, high capacity sorting, ease of use and high sanitation standards for the ultimate product quality, safety and profitability.

**Empowered consistent performance**
Double-sided viewing allows detection of subtle defects from two sides. High definition in-house designed and manufactured cameras achieve high quality sorting standards meeting high level market demands. Stable operation offers consistent performance over long period.

Calibration is only required once a week.

**High production capacity**
256 high speed, high flow ejectors efficiently remove defects, and 1200 mm viewing width ensures high product flow and low yield loss.

**Exemplary ease of use and high sanitation standards**
SORTEX K2A – for frozen process lines, a UHMW PE chute feed system is used to deliver the product efficiently to the Optical Vision System.

SORTEX K2P – for fresh process lines the Powerslide™ Conveyor can be used to deliver fresh product to the Optical Vision System.

Remote access enables to monitor performance whilst away from the machine, whereas easy access to all enclosures reduces serviceability costs.

Easy access, open design with stainless steel frame, hygienic and easy cleaning with IP56 protection for the ultimate food safety.
The SORTEX E1D can be used as a colour and shape sorter directly after the freezer tunnel, bulk-to-bulk or in end of line, using colour, shape and InGaAs\textsuperscript{HD} technology, providing the ultimate in quality sorting.

The UHMW PE chute feed system (no moving parts) delivers frozen product to the optical vision system efficiently.

A combination of technologies and options allow for processors to tailor the sorter’s inspection system to their specific needs with no need of daily calibration.

A soft landing option for fragile products ensuring minimal breakage.

The SORTEX E1D offers a high performance sort in a small footprint. It has been designed to bring the benefits of larger sorters to smaller processors, whilst delivering high quality sorting in the freezing process.
SORTEX E1A.
For the safest products in your packs.

The SORTEX E1A has been developed for FM removal in the packaging line. The high detection efficiency of this technology provides clean and safe product with maximum yield.

The SORTEX E1A offers consistent performance over a wide range of products and complex vegetable mixes with no changes to machine settings.

Efficient detection of packaging FM with high definition InGaAs technology removes plastic, wood and cardboard. High-speed ejectors efficiently remove defects with minimal loss of good product.

Colour measurement parameters can be adjusted to separate subtle colour differences; PROfile™ (shape) technology allows detection of defective material in real time through the measurement of multiple shape features on each object.
Innovative technologies.
Removing blemishes, misshapes and FM.

**Custom-designed cameras**
High-resolution optic sensors deliver the colour registration needed to detect the most subtle colour defects. When combined with InGaAs\textsuperscript{HD} technology these sensors allow the sorters to detect many commonly found foreign materials that compromise the safety and cleanliness of your product.

![Product with FM seen through visible wavelengths](image1)

**InGaAs\textsuperscript{HD} technology**
The next generation infrared detection technology from Bühler now in high definition with double the resolution to detect foreign materials down to half the size previously possible. With three times as many pixels, new InGaAs\textsuperscript{HD} detects the smallest pieces of hazardous materials that cannot be seen in the visible spectrum to meet the most stringent food safety and quality regulations globally.

![Product with FM seen through InGaAs\textsuperscript{HD} sensors](image2)

**PROfile\textsuperscript{TM} technology**
PROfile\textsuperscript{TM} technology can intelligently detect and virtually separate touching objects, allowing for higher capacity shape sorting. It can also use a combination of multiple shape parameters to remove stems and under or oversized products at the same time.

![EVM removed using PROfile\textsuperscript{TM} technology](image3)

**SORTEX ProSortX\textsuperscript{TM} operating software**
The latest update of Bühler’s proprietary operating software comes with a fresh new interface that’s modern, clean and intuitive to use. Featuring innovative FingerTipControl\textsuperscript{TM} and all-new Bühler ATOM\textsuperscript{TM} board for faster processing and navigation between screens.

![SORTEX ProSortX\textsuperscript{TM} operating software](image4)
Comparison charts.

Models and variants

<table>
<thead>
<tr>
<th></th>
<th>SORTEX K2A</th>
<th>SORTEX K2P</th>
<th>SORTEX E1D</th>
<th>SORTEX E1A</th>
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<tbody>
<tr>
<td>Enhanced InGaAs</td>
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- Standard             • Optional

Dimensions, air and power requirements

<table>
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<tr>
<th></th>
<th>SORTEX K</th>
<th>SORTEX E1D machine with vibrator</th>
<th>SORTEX E1A machine with vibrator</th>
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<tr>
<td></td>
<td>SORTEX K2A</td>
<td>SORTEX K2P</td>
<td>Short chute</td>
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<tr>
<td>Width (mm/in)</td>
<td>2423 / 95</td>
<td>2423 / 95</td>
<td>1740 / 69</td>
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<tr>
<td>Length (mm/in)</td>
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<td>2884 / 114</td>
<td>2930 / 115</td>
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<tr>
<td>Height (mm/in)</td>
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<td>2442 / 96</td>
<td>2060 / 81</td>
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<tr>
<td>Weight (kg/lbs)</td>
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<td>1250 / 2756</td>
<td>748 / 1600</td>
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<tr>
<td>Typical air requirements (L/s)*</td>
<td>65</td>
<td>65</td>
<td>32</td>
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<tr>
<td>Typical Power consumption (kW)**</td>
<td>4.5 (total)</td>
<td>6.0 (total)</td>
<td>E1D - 2 (total)</td>
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</tbody>
</table>

* Figures will vary based on throughput and input contamination levels.
** Figures will vary based on machine specifications.

SORTEX Customer Care.

SORTEX Total Care offers customers the opportunity to create their own service package, composed of individual service features, to best suit their needs. Customers can tailor their individual package from the following options:
- **WearCare** – Preventative Maintenance
- **RepairCare** – Emergency Repair
- **EjectorCare** – Ejector Service and Repair
- **AnywareCare** – Anyware Health Check and Alerts

**SORTEX Spares Kits**
For customers who require spare parts available on site, Bühler’s technologists have created appropriate spares kits for the different machinery available.

**SORTEX Upgrade Kits**
Customers seeking the latest technology available on their optical sorter – whether software or extra functionality – benefit from a range of upgrade kits available.
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