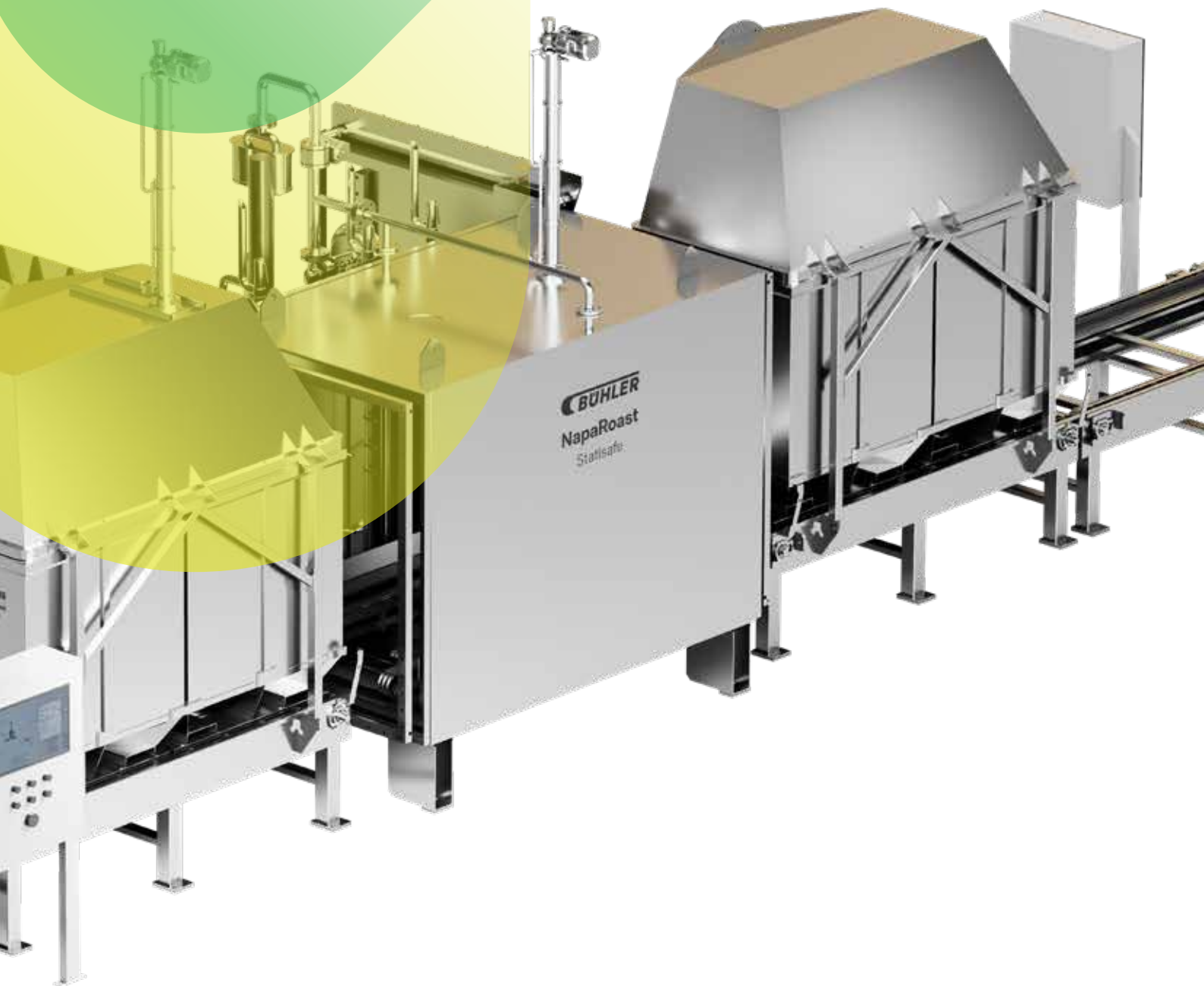


NapaRoast StatiSafe
**Steam-Vacuum
Pasteurization
+ Roasting**



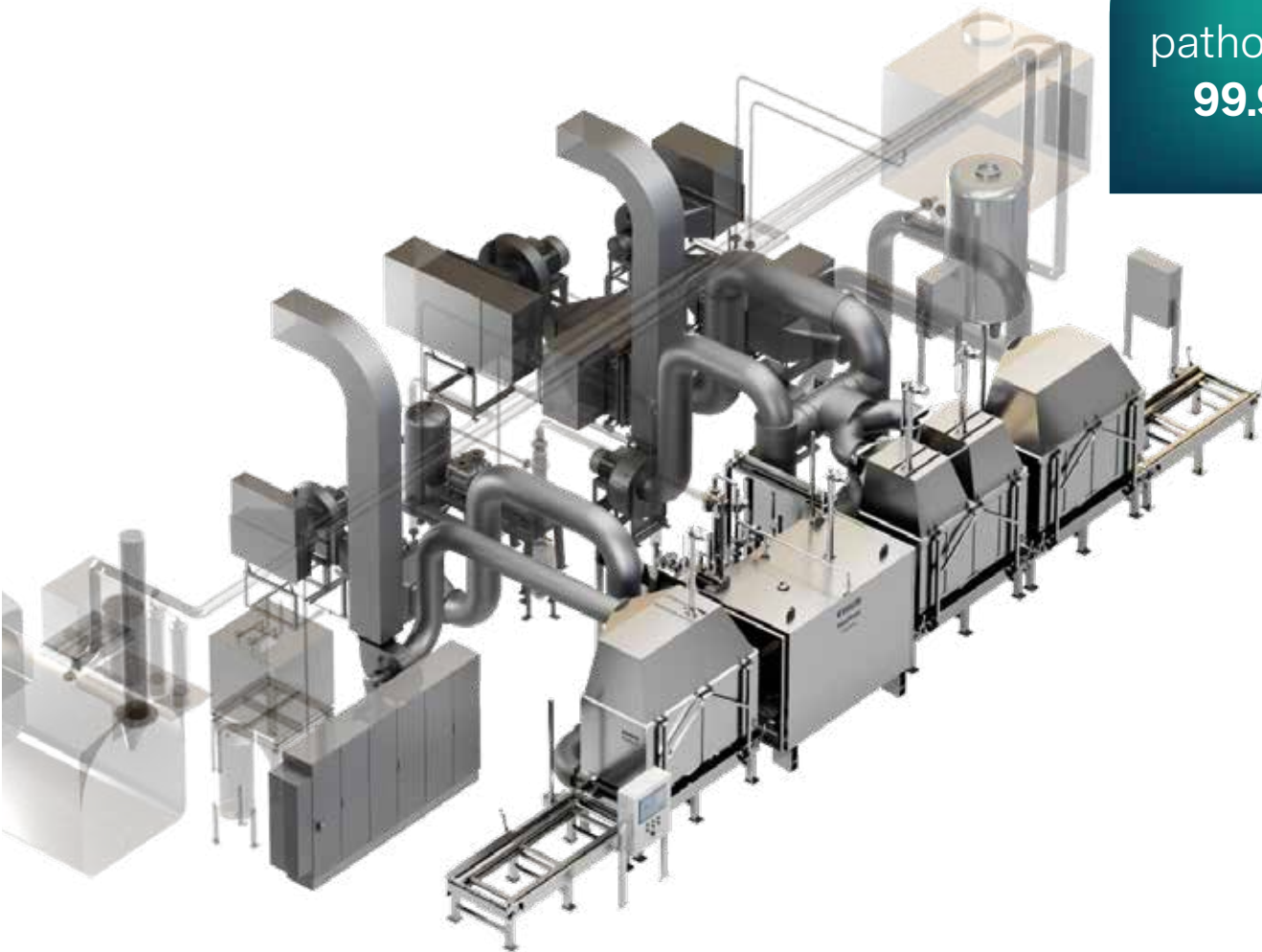
Bühler NapaRoast StatiSafe

Ensuring the highest standards of food safety

With stricter food safety regulations, innovative pasteurization solutions are key to meeting consumer preferences for chemical-free natural products.

Bühler is introducing Bühler NapaRoast StatiSafe, a cutting edge steam-vacuum pasteurization technology for nuts and seeds. The technology achieves a 5-log reduction of harmful pathogens, such as salmonella, e. coli, listeria and others while maintaining the natural flavors and qualities of the products. By combining NapaRoast StatiSafe's innovative technology with Bühler's engineering excellence, processors can achieve the highest food safety standards with a compact and flexible setup.

5-log
reduction in
pathogens by
99.999%



Pasteurization product examples

Bühler NapaRoast StatiSafe offers pasteurization and roasting technologies that deliver unique benefits to a wide variety of nuts and seeds, so you can create diverse and innovative products with the highest standard of food safety. Bühler NapaRoast StatiSafe can handle whole, sliced, diced and pieces of all shapes and sizes, making it a unique and flexible solution.

Almonds (TERP)
whole



Walnuts: halves,
pieces



Hazelnuts:
inshell, kernels



Pistachios:
inshells, kernels



Cashews: whole,
diced



Macademia:
size 0 to 7



Pinenuts:
whole



Cocoa beans



Flaxseeds



Pumpkin



Sunflower seeds



Sesame



Black pepper



Red pepper



Whole ginger



Vanilla





Unlock and retain natural flavors

The gentle pasteurization process does not change the natural flavors, colors and crunchiness of your products. Bühler NapaRoast StatiSafe's uniform pasteurization and roasting is efficient at low temperatures, thus maintaining the raw product's qualities—resulting in better tasting, higher quality products.



5log pathogen reduction with no moisture pickup

Bühler NapaRoast StatiSafe technology is fully compliant with the strictest food safety requirements and achieves a 99.999% reduction in microbial pathogens. Surfaces remain clean and there is no cross contamination or allergen risk. As there are no moving parts, maintenance and risk of product damage is also reduced.



Maximize shelf life

Bühler NapaRoast StatiSafe technology extends shelf life due to soft product handling in bins. While, scuffing and breaking in continuous process increases exposure to oxidation. Pasteurization takes place in a vacuum, greatly reducing the risk of fat oxidation which leads to rancidity. With low oxidation, the product's shelf life is greatly increased, leading to far better consumer experiences.



Wide range of applications

Bühler NapaRoast StatiSafe can pasteurize a wide variety of nuts, seeds, dried fruits, herbs and spices. StatiSafe can treat whole, sliced, diced and pieces of all shapes and sizes. Capacities range from 200 kg / hr - 6,000 kg / hr.

Key benefits

Efficient, sustainable, and high-quality pasteurization



Small footprints & variety of capacities



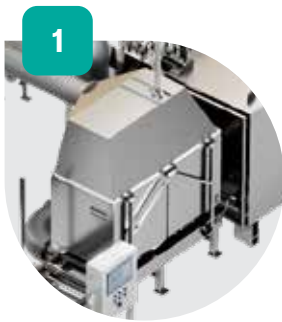
Flexibility & easy change-over



Highest food safety standards

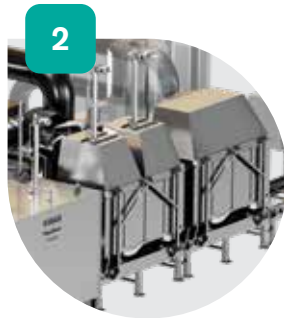
Bühler NapaRoast StatiSafe

Product features



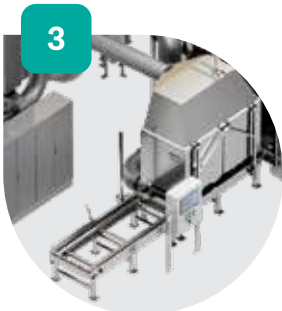
Energy efficient steam-vacuum pasteurization

Pre-heating the product ensures that the pasteurization step is more efficient. With saturated steam a >5log reduction is achieved with no moisture pickup. The partial vacuum enables pasteurization to take place at low temperatures and without oxidation.



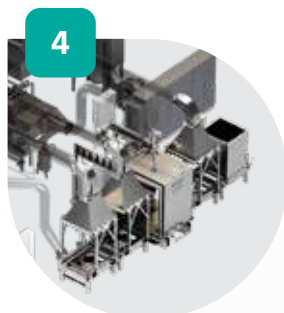
Patented air roasting process

After the kill-step, the product can be roasted with perfect control of roasting degree to match flavor profiles. The bins then move automatically to the cooling platform, where the load is cooled with HEPA filtered chilled air until ambient temperature is reached.



Easy cleaning and maintenance

As the product is treated in separate bins, there is minimal cleaning required for the platforms themselves. Additionally, with few moving parts and minimal wear and tear—maintenance costs are also minimized.



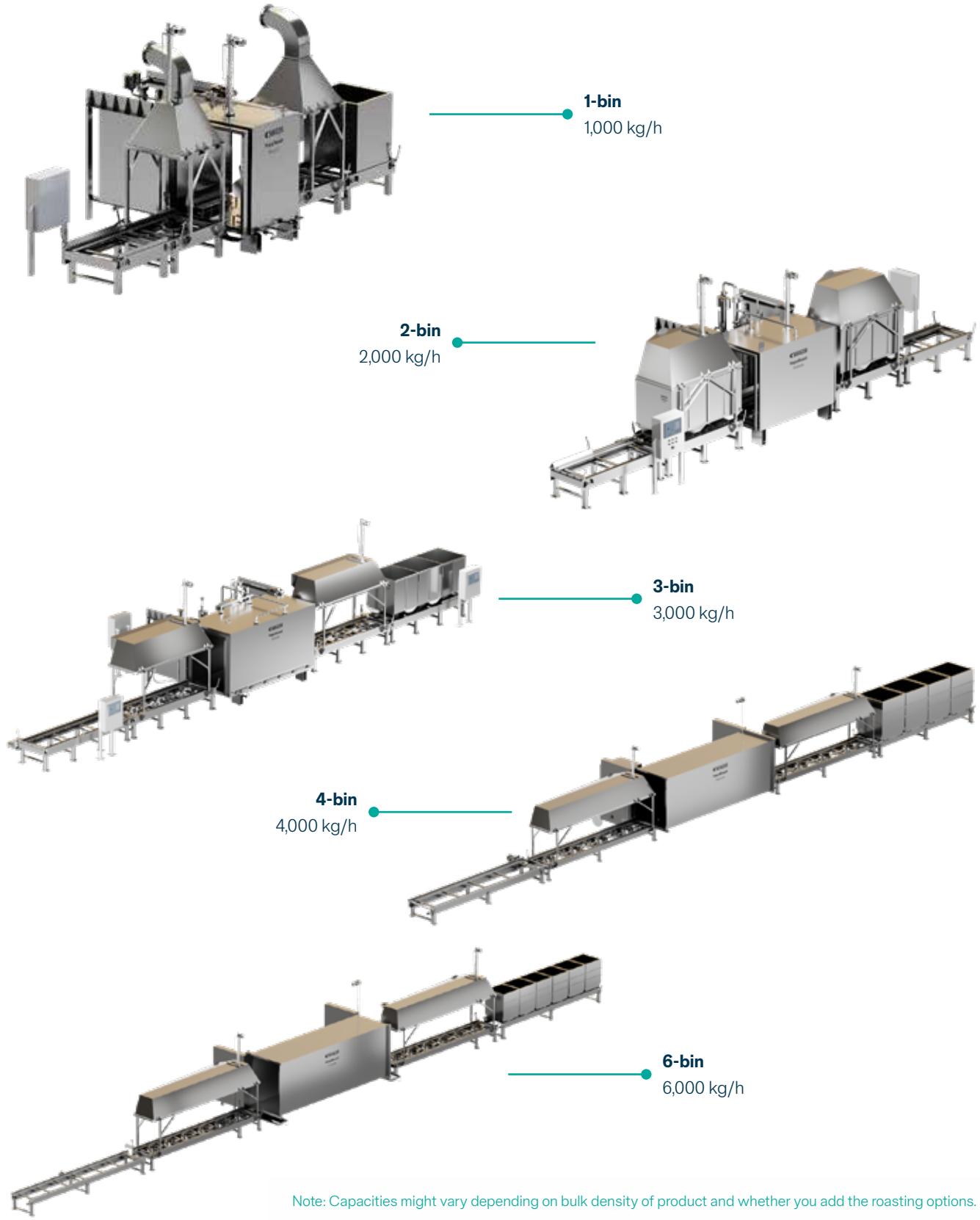
Low operating costs

The loaded bins move automatically through the sections, reducing the need for operator oversight. With no drying or chemicals required, the unit cost of operation is < € 0.07 / kg.





Plant configuration Bühler NapaRoast StatiSafe Available in different sizes



Note: Capacities might vary depending on bulk density of product and whether you add the roasting options.





Batch transparency with reliable automation

The Bühler NapaRoast StatiSafe pasteurization system features intuitive touch screen control that ensures easy operation and safe, efficient production. Equipped with safety circuits to prevent damage from improper use, the system automatically stops in emergency situations. For enhanced quality control and food safety, it logs realtime and historical data ensuring full traceability.



Bühler NapaRoast StatiSafe – product and capacity

Pasteurization

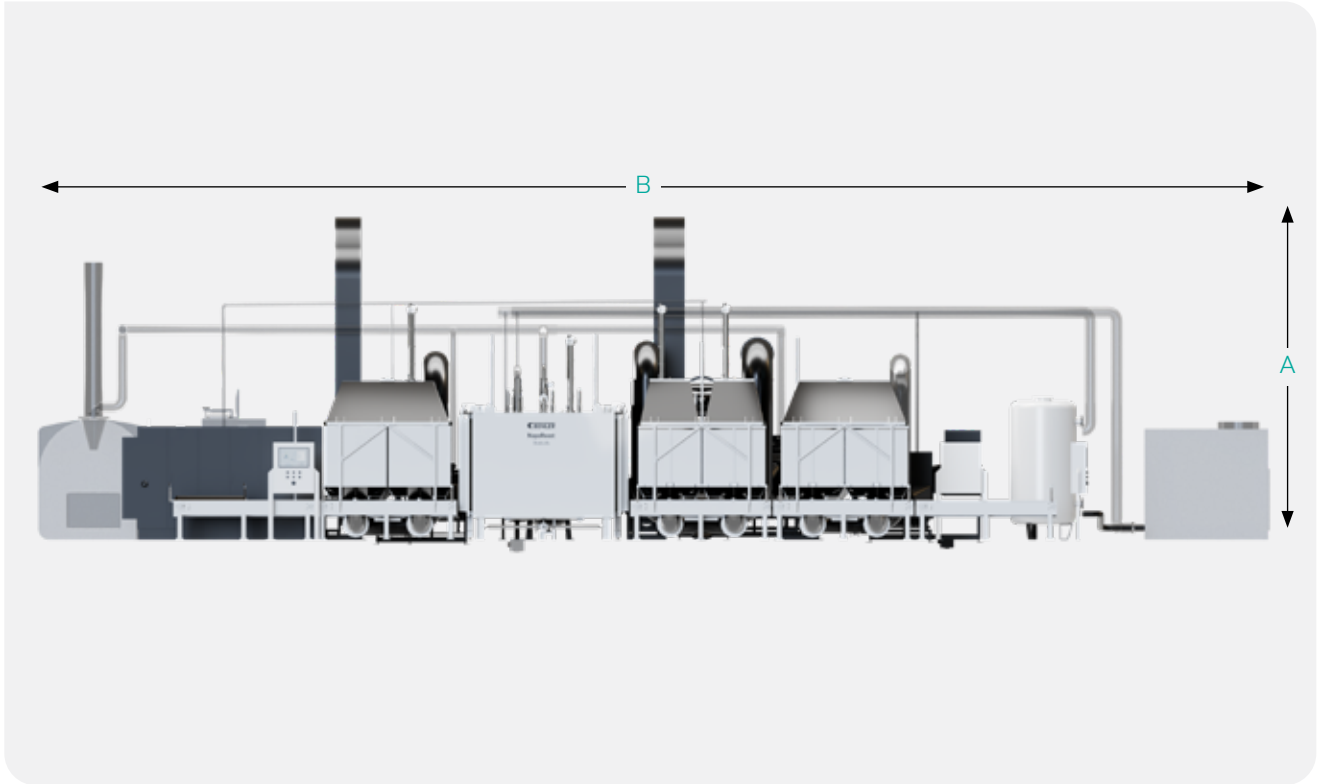
| Product & Configuration | Bulk Density | 1-Bin | 2-Bin | 3-Bin | 4-Bin | 6-Bin |
|-------------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Almonds (TERP) whole | 460 g/L | 800 kg/h | 1600 kg/h | 2400 kg/h | 3200 kg/h | 4800 kg/h |
| Walnuts: halves | 401 g/L | 750 kg/h | 1500 kg/h | 2250 kg/h | 3000 kg/h | 4500 kg/h |
| Hazelnuts: in shell | 481 g/L | 900 kg/h | 1800 kg/h | 2700 kg/h | 3600 kg/h | 5400 kg/h |
| Pistachios: in shell | 458 g/L | 850 kg/h | 1700 kg/h | 2550 kg/h | 3400 kg/h | 5100 kg/h |
| Cashews: whole | 593 g/L | 1100 kg/h | 2200 kg/h | 3300 kg/h | 4400 kg/h | 6600 kg/h |
| Macadamia | 689 g/L | 1300 kg/h | 2600 kg/h | 3900 kg/h | 5200 kg/h | 7800 kg/h |
| Flaxseed | 700 g/L | 1200 kg/h | 2400 kg/h | 3600 kg/h | 4800 kg/h | 7200 kg/h |
| Sunflower Seeds | 620 g/L | 1100 kg/h | 2200 kg/h | 3300 kg/h | 4400 kg/h | 6600 kg/h |
| Chia Seeds | 667 g/L | 1200 kg/h | 2400 kg/h | 3600 kg/h | 4800 kg/h | 7200 kg/h |
| Sesame Seeds | 580 g/L | 1100 kg/h | 2200 kg/h | 3300 kg/h | 4400 kg/h | 6600 kg/h |
| Chilli: crushed | 220 g/L | 400 kg/h | 800 kg/h | 1200 kg/h | 1600 kg/h | 2400 kg/h |

All values in [kg/h]. Capacities indicated are subject to tolerance $\pm 10\%$, depending on customer requirements. Values for indicative purposes only.



Technical details

Bühler NapaRoast StatiSafe

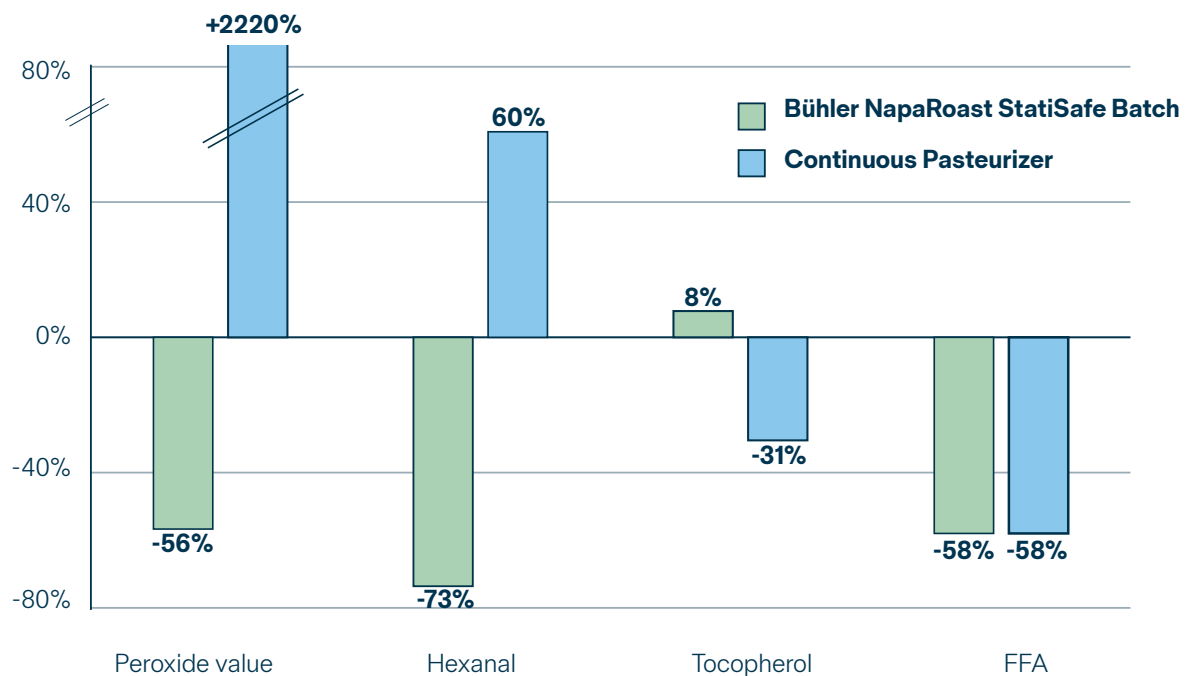


| Technical features | 1-Bin | 2-Bin | 3-Bin | 4-bin | 6-Bin |
|------------------------------------|--------|--------|--------|--------|--------|
| Overall height (A) | 5.4 m | | | | |
| Overall length (B) w/o roasting | 8.5 m | 17 m | 25.5 m | 34 m | 51 m |
| Overall length (B) w roasting | 9.8 m | 19.6 m | 29.4 m | 39.2 m | 58.8 m |
| Steam pressure | 11 bar | 11 bar | 11 bar | 11 bar | 11 bar |

Bühler NapaRoast StatiSafe Increases Walnut Shelf Life

A 2023 University of California Shelf-Life Study compares two pasteurization processes: the Bühler NapaRoast StatiSafe batch process with a continuous pasteurization process. After 9 months storage, rancidity markers were compared in pasteurized and unpasteurized walnuts.

**Rancidity markers after 9 months of storage
pasteurized compared to unpasteurized walnuts**



✓ **Bühler NapaRoast StatiSafe extends the shelf-life**
of walnuts compared to unpasteurized walnuts

✗ **Continuous pasteurization reduces the shelf-life**
of walnuts compared to unpasteurized walnuts



| Rancidity marker | Bühler NapaRoast StatiSafe batch | | Continuous pasteurizer | |
|--|---|---|--|---|
| <p>Peroxide Value (PV) Peroxides are formed when fats are oxidized by oxygen</p> <p>Fresh walnuts <0.5meqO2/kg oil, rancidity starts at 2-5meq/kg, peaks at 20 to>30meq/kg</p> | <p>56% lower</p> <p>After 9 months shelf life: Pasteurized: PV<4meq/kg Unpasteurized: PV>9meq/kg</p> | ✓ | <p>12-fold higher</p> <p>After 9 months shelf life: Pasteurized: PV>56meq/kg Unpasteurized: PV<3meq/kg</p> | ✗ |
| <p>Hexanal As lipid oxidation progresses peroxides breakdown into hexanal, responsible for the off flavor and odor of rancid nuts</p> <p>Fresh walnuts <1ppm, Rancidity is noticeable at 5-10mg/l levels</p> | <p>73% lower</p> <p>After 9 months shelf life: Pasteurized: 1.08mg/kg Unpasteurized: 4.04mg/kg</p> | ✓ | <p>60% higher</p> <p>After 9 months shelf life: Pasteurized: 2.4mg/kg Unpasteurized: 1.5mg/kg</p> | ✗ |
| <p>Free Fatty Acids (FFA) FFA are produced by enzymatic oxidation</p> <p>Fresh walnuts have FFA <1% Oleic acid, at 1.2% to 2% the nuts are rancid</p> | <p>55% lower</p> <p>After 9 months shelf life: Pasteurized: 0.22% oleic acid, Unpasteurized: 0.52% oleic acid</p> | ✓ | <p>55% lower</p> <p>After 9 months shelf life: Pasteurized: 0.19 oleic acid, Unpasteurized: 0.45 oleic acid</p> | ✓ |
| <p>Tocopherol (Vitamin E) Natural antioxidant that protects the nuts from oxidation</p> <p>Fresh raw walnuts contain up to 500mg/kg Vitamin E</p> | <p>8% higher</p> <p>After 9 months shelf life: Pasteurized: 390mg/kg Unpasteurized: 362mg/kg</p> | ✓ | <p>31% lower</p> <p>After 9 months shelf life: Pasteurized: 390mg/kg Unpasteurized: 362mg/kg</p> | ✗ |





Research and training centers

Our main offerings

Product innovation is a fundamental part of Bühler. With our global setup of research and training centers, you can develop new recipes, try new processes, test different machine settings and configurations, compare different technologies, and analyze the influence of raw materials on finished products together with our experienced process technologists.



-  Bühler research and training centers
-  Partnership research and training centers

Global expertise, available locally—Bühler has research and training centers in 26 locations around the world, some of which cover multiple industrial applications.



Recipe creation

Use our state-of-the-art equipment and have exchanges with our experts to work on new products or improve the brands that you have. Compare different processes and optimize production in an industrial set-up.



Machine trial

Let yourself be convinced by our solutions before buying. Experience the potential of the complete portfolio of machines, services, digital solutions, and automation.



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