Portioning with highest precision and speed

Integrated poultry portioning solutions

JBT Marel

What do you need to portion today?

Global demand for portioned deboned poultry meat is increasing all the while. To satisfy this demand, good portion cutting is all about automation, speed, precision, and integrated solutions that make your life easier.

Worldwide, chicken are getting bigger and larger. That means their breast and leg meat also grows in size and weight, making these pieces simply too big for end user consumption. So portioning is an absolute must to create whole muscle meat pieces with the required sizes and weights for QSR, retail and food service customers.

Which applications do you need to achieve this?

Whether you need to cut sandwich fillets, strips or cubes, JBT Marel offers you multiple options, all with their own specialties. Such integrated solutions can include blade cutting, waterjet cutting, robotic positioning, smart sorting, intelligent software, and more.

Technological assets

JBT Marel portioning solutions allow you to keep pace with the ever changing and ever more challenging demands. JBT Marel systems can now claim to be the industry benchmark. They use the very latest hardware and software technology. The result is superior accuracy, optimum raw material usage giving a very attractive return on investment.

Why choose JBT Marel's portioning solutions?

Best raw material use

The very best use of the raw material means adding value not just to the main product but to the off-cut as well. Minimal giveaway means higher profits; automation means top productivity; full traceability means enhanced food safety.

Total solutions

When you're looking to maximize the value of your portioning system, JBT Marel stands by your side. As the total solution provider, JBT Marel helps you integrate every single module seamlessly into your processing line, so you can take full advantage of the connected capabilities. Complementary solutions and software can be added to the line to automate both upstream and downstream processes—bringing added value, greater efficiency and labor independence to your portioning workflow.

JBT Marel offers standardized service, spare parts, and software across all its solutions, giving you the full benefit of a one-stop supplier. This not only saves you time and money—it also reduces hassle. Any operational concerns you may have are fully taken care of.

Hygiene

All JBT Marel portioning solutions have been designed to meet the most stringent food safety regulations. Easy access for cleaning means that this job can be done quickly, thoroughly and efficiently, a top priority in today's high throughput, multi shift operations.

JBT Marel's portioning solutions can also process duck and turkey meat.

- **System integration**
- **Optimized utilization of raw material with lowest give-away**
- **Accurate portioning with maximum yield**
- **Intuitive software**
- **Food safety and hygiene**

Fillets

Everywhere in the world, food companies are in need of sized fillets. Retailers, supermarkets, QSR, and food service customers are all requiring more of the whole muscle chicken sandwich fillets, medallions, minute steaks and more. How can you respond to this growing demand?

JBT Marel helps you design the most effective portioning solutions to deliver these sized fillets—quickly, flexibly, profitably.

The breast meat that is selected to become sized fillets can undergo different processes: slicing, flattening, cutting, and sorting, depending on the requirements. The portion cutting process is the most crucial in this. Portioning fillets can be achieved through different methods: the proven approach using mechanical blades, or the distinctive method employing high-pressure water jets.

How to portion sized fillets?

You have multiple options to produce uniform, high-quality sized fillets on a fully integrated JBT Marel portioning line.

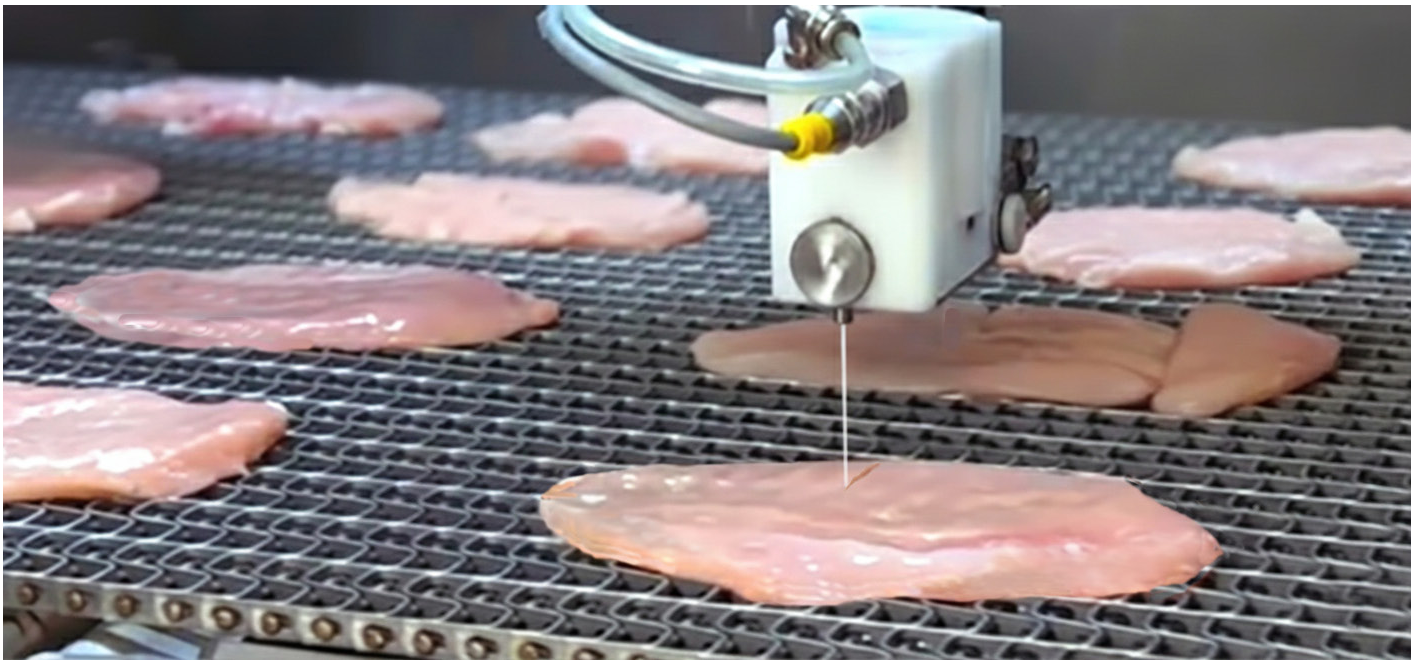
Slicing

If your large-size raw material needs to be horizontally split first, you can put a splitter at the start of your portioning process. Consistent horizontal slicing will divide the original 'thick' jumbo-fillet into two valuable, natural looking breast meat pieces. Depending on the requirements and settings, the resulting thickness will be uniform.

Flattening

As poultry portions are getting bigger, due to larger growing birds, they sometimes need to be adapted to the required weight and size of the end product. Flattening is one of the methods that can be used. JBT Marel offers various flattening solutions.

While maintaining their integrity, moisture and taste, the portions can be flattened to create the ideal shape and weight for end product purposes, such as sized fillets. JBT Marel's solutions put less pressure on the poultry by massaging it over a shorter period of time than other flattening equipment. This results in a high-quality bite, texture and taste.



Positioning

In times of labor scarcity, accurately positioning raw material on the belt — especially keeping pieces from overlapping — is a task best handled by robotics. Neither blade cutters nor waterjet cutters can handle such overlapping products. The RoboOptimizer is a perfect fit for processors in need of a proper infeed for their portioning line.

The RoboOptimizer's software precisely analyzes each fillet to determine its optimal orientation. The precise positioning is seamlessly transferred to the portion cutter so that it can execute the optimal cutting patterns for the least giveaway. Thanks to the RoboOptimizer, the quality and uniformity of end products is guaranteed, thereby avoiding customer claims for badly cut products.

Portioning

You can cut deboned poultry breast meat into fixed-weight, sized fillets in different ways. In some cases, it is possible to cut two, or even three, sized fillets from one single heavy breast fillet.

By using a waterjet cutter, such as the DSI 800 series, you can not only cut out a fixed-weight fillet, but also trim away fat and divide the remaining raw material into other valuable portions, like strips or cubes. Thanks to the possibility to cut curved patterns in one go, the most favorable pieces, delivering the highest yield and the least giveaway, can be programmed via the software. It will then calculate the optimal cuts for each raw fillet in any given situation.

A blade cutter such as the I-Cut 122 TrimSort is a high-speed machine with superfast knives. It can handle large product volumes on two lanes, each with its own program. The intuitive software makes programming easy. You can also save recipes for specific customers and use them again later. For example, you can store a recipe to portion a QSR-validated sandwich fillet together with valuable strips on the side. This way, you always get the same consistent results.

Either DSI waterjet and I-Cut blade cutting systems can precisely tailor large-size products to meet unique consumer tastes across the globe, in Asia, Europe and America. Whether it's minute steaks for Germany, or chicken sandwiches for the USA, you can satisfy any local preference and at the same time make each piece as valuable as possible to maximize profits.

Sorting

The I-Cut 122 TrimSort has an integrated sorting system. Other blade cutters and DSI waterjet cutters can be combined with a separate sorting machine or a manual process to separate the main products and the offcuts. For further processing downstream, such as with the SensorX, the main products continue to the next processing step. The valuable offcuts go to another conveyor, a dolav or a bulk destination. A sorter removes not only offcuts, but can also sort portions. This saves a lot of labor. Its reject mechanism works so fast that it can remove trim from both the front and the back of the portioned product. A JBT Marel sorter can handle even the highest throughputs

Strips

Strips are important products in the whole muscle chicken meat market, not only because they offer a lot of flexibility. Strips can be used in many dishes, like salads, wraps, sandwiches and hot meals.They also meet consumer demand for less processed food, as strips come from whole muscle meat rather than formed products.

For processors, depending on their customers‘ requirements, strips can be the main product to cut from a fillet, or they can be cut alongside a sized fillet.

With the right cutting and sorting equipment from JBT Marel, you can create consistent, high-quality strips that add value to your product range and help you stay competitive in all the mentioned markets.

How to portion strips?

With a fully integrated JBT Marel portioning line, you can choose from several ways to produce uniform, high-quality strips.

Alongside sized fillets

If you produce strips alongside sized fillets, you can use the same line configuration as for producing sized fillets. The software can calculate how to create as many uniformly sized or fixed-weight strips as possible around the sized fillet cut from the raw material — which is the large-size breast fillet.

Strips-only production

If your main products are fixed-weight or consistently sized strips cut from raw material, your line configuration may be slightly different. Depending on your customers' requirements, you may not need to slice or flatten the raw product — and still get the maximum value from your resources.

Splitting, flattening, positioning

If the large-size raw material needs to be horizontally split first, you can add a splitter at the start of your process. The same applies to flattening, to adjust to the target weight and size of the final products.

In combined production of fillets and strips, and in strips-only production, positioning the raw material on the belt can be crucial. It can determine how many uniform strips you can cut.

Combined with a blade cutter, a RoboOptimizer can do this job very effectively, thanks to its strip-optimizing software. Each uniquely shaped fillet is analyzed to find the best orientation for creating strips of the right length. For example, if you want to produce QSR strips, the fillet is angled in a specific way; a larger fillet is angled differently to avoid strips that are too long. This full control leads to significant yield improvements and much higher product quality.

Portioning

There are multiple options to portion strips. With waterjet cutting, all possible combinations can be created for each individual piece of meat.

Smart software can decide whether to cut strips only, sized fillets plus strips, strips and cubes, and more. Even curved cuts are possible to get the most value out of each piece.

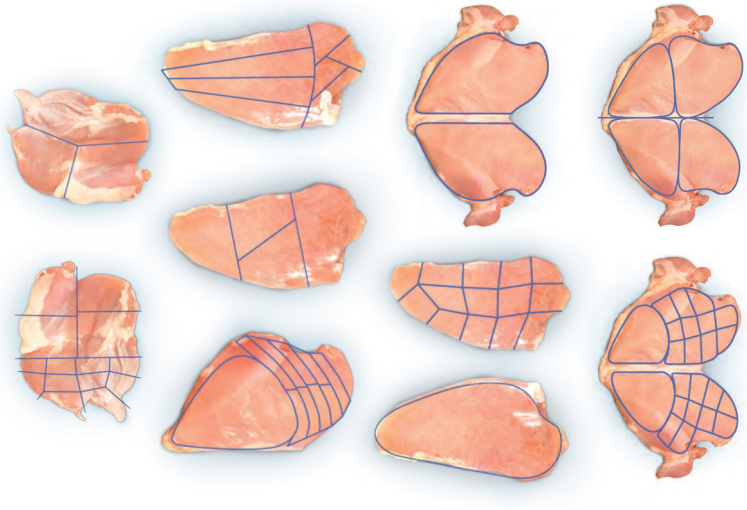
With a blade cutter, the decision to portion strips in a specific way must be made for the entire batch. On the HMI touchscreen, you can select a recipe that cuts the infeed product optimally and at the highest speed to produce high-yield, fixed-weight strips. This can be a strips-only recipe, a strips-plus-fillet recipe, or any other product combination.

Sorting

Once cut with a blade cutter, strips can automatically be separated from the offcuts by a sorter. In an I-Cut 122 TrimSort, this can happen immediately after cutting, inside the machine itself. If the strips are the main products, they stay on the upper conveyor belt, while the offcuts fall onto the lower belt. If the sized fillet is the main product, the strips will go to the lower belt instead.

The same principle applies to an external sorter. If sorting is required after a waterjet cutter, it can only be done manually.

Examples of cuts with a waterjet cutter



Examples of cuts with a blade cutter

Input	**500 g butterfly**	**200 g thigh with skin**	**230 g fillet**	**230 g fillet**
Output	2 fillets to fixed weight range, 1 middle trim	Fixed-weight thigh piece and side trim	1 natural-looking fillet to fixed weight range and 1 nugget piece, knife angle 45°	1 natural-looking fillet to fixed weight range and 1 outside side trim (false tender), knife angle 45°

Input	**45 g tender**	**45 g tender**	**230 g fillet**	**230 g fillet**
Output	Split tender	Nuggets to fixed weight range	Strips of fillet	Split and diced fillet (2 runs)

Cubes

Whole-muscle meat cubing is becoming a high priority around the world, not only for QSR chains, but also for processors in the food service and retail sectors. The starting point for cubing should always be to maximize the value of deboned products. The closer the products get to pre-prepared food, the higher the value. Cubing offers lots of possibilities to achieve this, whether using whole products or off-cut chunks of leg meat or breast meat. As long as it is about adding more value to the raw material.

There's a difference between whole-muscle cubes and something that looks like a cube. So this is not about formed nuggets in QSR restaurants. Whole-muscle cubes may vary from chopstick cubes in Asia to finger food bites and skewers in Europe and America. The highest-value products are always fixed-weight cubes with a consistent, nice presentation and the same surface, to pick up the same amount of coating.

How to portion cubes?

With the right cutting and sorting equipment from JBT Marel, you can create consistent, high-quality cubes that add value to your product range and help you stay competitive in every market.

Whether it's breast meat or leg meat, skin-on or skinless, JBT Marel has the solutions to add most value by creating exemplary fixed-weight cubes. Each individual piece gets the right shape and the right weight to go on a skewer or to be sold as finger food. This is truly creating a higher value for deboned products, because you can ask a higher price for the extra effort you have put into the raw product.

At JBT Marel we have configured various standardized concepts where the quality and volumes are high. Are you making cubes for supermarkets? Then there is one solution. Do you make skewers? Then there is another solution. Or is it for fast food? Then we have a third or fourth solution. We can offer a high-speed line or a more flexible smaller line that can still create the same products.

In one go

As a waterjet cutter can portion cubes (and even irregular shapes) in one go, a cutting line for cubes only is simple. Maybe a slicer or flattener can be added before the cutter, but the line itself only needs the DSI Waterjet Cutter to do all the work. The software can calculate exactly how many high-value, fixed-weight cubes can be cut from each piece of meat.

The sorting process to separate offcuts from the uniform cubes will be done manually.

Two steps

In a blade cutting environment that starts with large-size fillets as raw material, cube cutting usually requires at least two steps. First, the fillet is cut into strips; then, those strips are cut into cubes. This can be done using two blade cutters placed one after the other, or by using a return belt on a dual-lane, dual-program portion cutter.

With a return belt, one lane handles strip cutting. Depending on customer orders, a calculated number of strips are sent back via the return belt to the second lane for cube cutting, all while maintaining high speed. When using two blade cutters in sequence, both lanes remain available—first for strip cutting and then for cube cutting—so you achieve the highest possible throughput.

if you start with tenderloins or strips instead of whole fillets, cube cutting can be done in a single step on the same high-speed line.

Splitting, flattening, positioning

In many cube cutting configurations, it is useful to add a horizontal splitter, flattener, and positioner to the line. Whether the infeed base material for the waterjet or blade cutter is large fillets, tenderloins or strips, cubing works much better when products are placed properly and do not overlap on the belt. This can decide how many uniform cubes you can produce.

If you produce a mixed recipe of strips and cubes, you can use the same line setup as for cubes only. You simply choose not to send all the strips to the return belt. Switching programs is very easy. The software can calculate how to create as many uniform or fixed-weight strips as possible 'around' the sized fillet from the raw material — the large-size breast fillet.

Sorting

Sorting cubes after they have been cut will often be a manual job, picking out the pieces and offcuts that are too small. The I-Cut TrimSort sorts these offcuts by itself in the machine.

Portioning

Shape portions and trim away fat

DSI 800 Series Waterjet Cutter

Today, retail and food service customers make rapidly changing demands: one day, they request fat-free portions, while the next day, a bit of fat is acceptable. They may want weight and shape-controlled portions one day and dimension-specific portions the next.

More possibilities than you ever imagined

The DSI Waterjet Cutter allows you to cut shaped portions and trim away fat. It is easy to quickly change applications with the push of a button. DSI portioning systems are sized to match your production needs. Its automated operation reduces labor, repetitive motion injuries, while ensuring consistent performance and enhancing food safety.

The DSI system can handle butterflies, fillets, tenderloins and deboned leg meat as input material, to turn into virtually any portion shape—ranging from steaks, strips, nuggets, cubes, and dices to creative forms like magnolias or dinosaurs. With DSI waterjet cutting, you can precisely tailor products to meet unique consumer tastes across the globe, in Asia, Europe and America. Whether it's kakugiri for the Japanese market, minute steaks for Germany, or QSR nuggets for the USA, you can satisfy any local preference. each piece as valuable as possible to maximize profits.

How does it work?

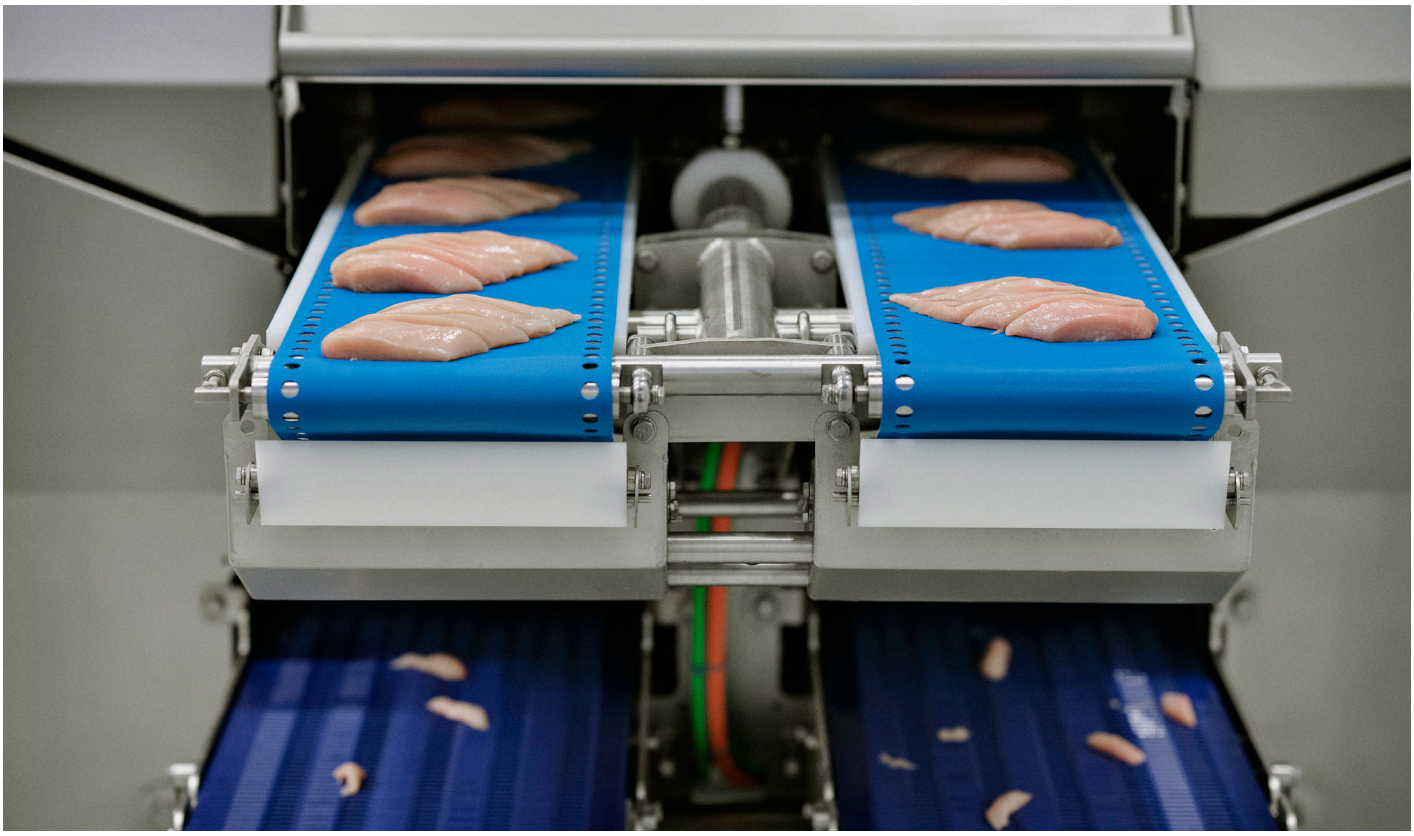
The DSI Waterjet Portioning System is a multi-lane, multi-cell water cutter, which is easily extendable. Every cell has two waterjets.

First, the DSI Waterjet Cutter scans your products to locate fat and to determine shape, thickness, weight, and many other attributes. Then, DSI Q-Link™ portioning software optimizes a cut strategy for each individual piece of raw product. Finally, the cutter goes to work: the computer positioned high-pressure waterjets generate complex cutting shapes that make each piece as valuable as possible to maximize profits.

If you can sketch it, DSI can portion it

The DSI Waterjet Cutter requires no positioning at the input. It accurately cuts all types of pieces of meat according to the programmed pattern, regardless of how it's placed on the belt. There are virtually no off-cuts—every piece, no matter how small, can be portioned into a useful and valuable product, resulting in an absolute minimal giveaway.

- Flexible shape cutting pattens and fat trimming
- High accuracy at high throughput
- Absolute minimal giveaway
- Easy of operation changing product mix and orders



High-speed dual lane, dual function

I-Cut 122 TrimSort portion cutter

The I-Cut 122 TrimSort portion cutter takes portioning to a whole new level. It is ideal for a high speed in-line process and can be used to portion non-frozen deboned poultry breast and thigh meat into the widest possible range of small to medium sized fixed weight and/or uniform dimension products with minimum giveaway. These products will be suitable for super-markets, the retail trade, restaurants, fast food outlets and for use in further processing.

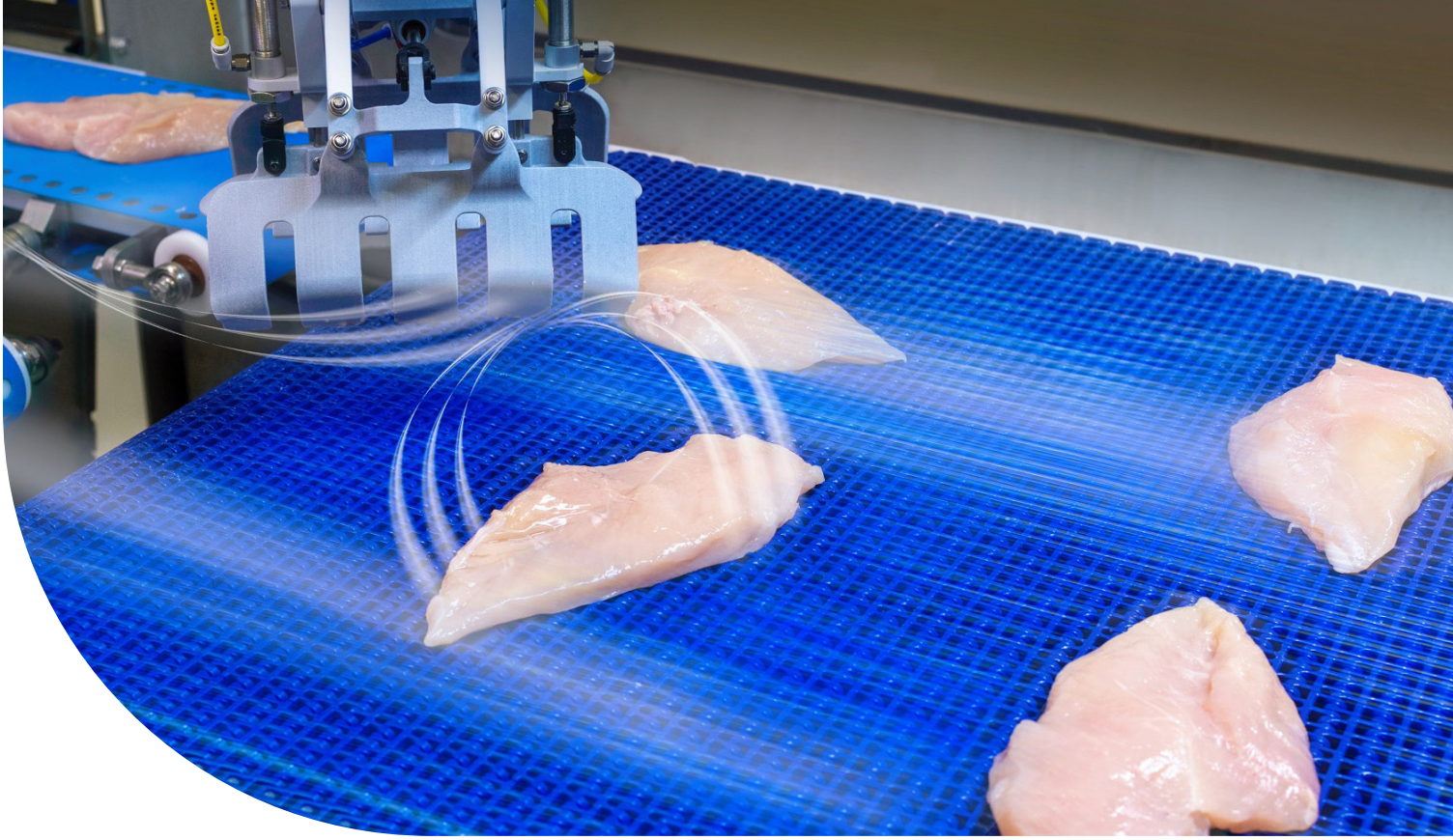
The intuitive software program developed by JBT Marel makes programming easy. To save time, menus for specific customers can be stored and retrieved when necessary. The I-Cut 122 can cut product to one of four cutting angles. After each change in angle, the system's software adapts automatically.

Apart from doubling potential capacity, dual lane infeed means that two different products can be made at the same time. The cutting pattern for each product can be seen clearly on the system's touchscreen and can be changed on the fly.

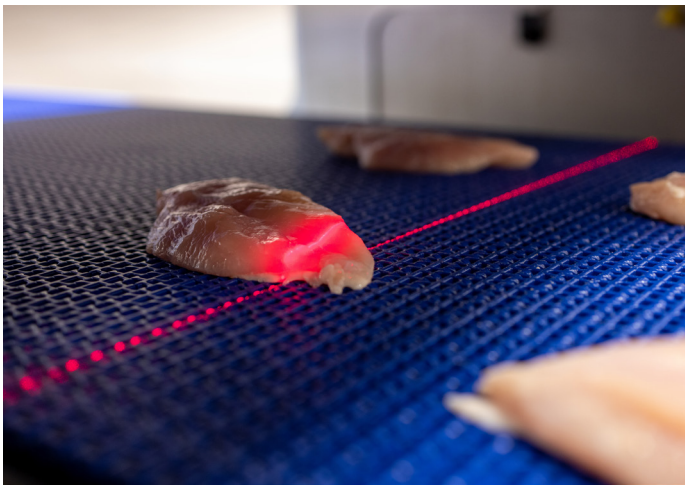
- Intelligent cutting patterns
- Cutting to fixed-weight with minimal giveaway
- TrimSort functionality splits product streams
- Adjustable cutting angles possible
- High-speed functioning maximizes yield

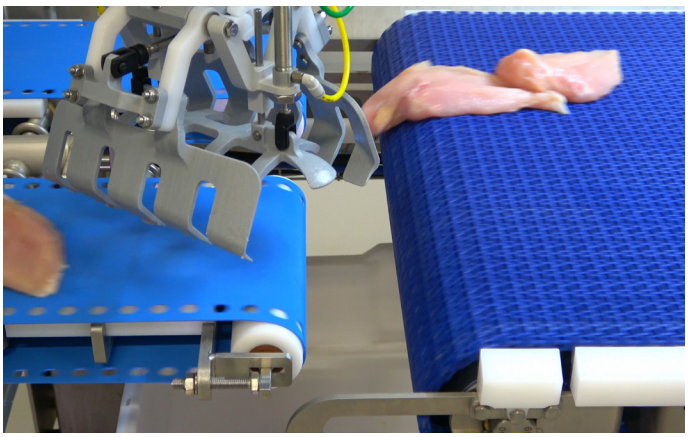
TrimSort

I-Cut 122 with integrated TrimSort functionality is able to make separate streams of cut products and the trim cut from them. This further reduces giveaway with no need for human intervention. TrimSort allows for the distribution of many combinations of high-value cut products, by accurately splitting the product flow at the highest speeds to the two integrated belt pairs. The chosen program determines which cut parts stay on the upper conveyor and which parts land safely on the second internal conveyor. This lower outfeed belt will take these portions or trim to another process.



Positioning





Overlapping products will automatically be rejected, preventing them from cluttering the production.

Labor-saving

One of JBT Marel's solution for positioning is the RoboOptimizer. Its software precisely analyzes each fillet to determine its optimal orientation, taking into consideration left and right fillets. That's because cutting against the direction of the meat fibers should be avoided. This precise positioning is seamlessly transferred to the portioning machine, triggering its software to calculate and execute the optimal cutting patterns for the least giveaway.

Achieving consistently good positioning results proves nearly impossible for humans. The RoboOptimizer addresses this issue by organizing the products on the belt, ensuring precise and traceable positioning for the portion cutter. With its superfast gripper, the RoboOptimizer restores order to the random positioning of products, even on two different belts

A robotic positioner saves labor by taking the hard work out of the portioning loading process. Both waterjet cutters and blade cutters gain from this, not in the least because it rejects overlapping products, preventing them from cluttering the production. Through perfect positioning on the conveyor belt, the uniformity of end products is guaranteed, thereby avoiding customer claims for badly cut products. Human operators who touch the products are no longer necessary, so besides saving labor, robotic positioning also retains optimal meat integrity and therefore food safety.

Rejects

Another strong point of the RoboOptimizer is that it skips loose trimmings, faulty products and products that are too close to each other. Such products reach the end of the belt without being sent to the portion cutter at all, because this would only clutter the process. This JBT Marel rejection technique is unique.

A line setup which includes proper positioning helps add maximum value to each portioned piece of chicken meat. Each sandwich fillet, strip, cube or nugget can be cut exactly to the desired end product size and shape.

Splitting, slicing, profiling, flattening

JBT Marel markets automatic splitting, slicing, profiling and flattening machines. These can be installed either stand-alone or as part of an integrated portioning system.

Profiling

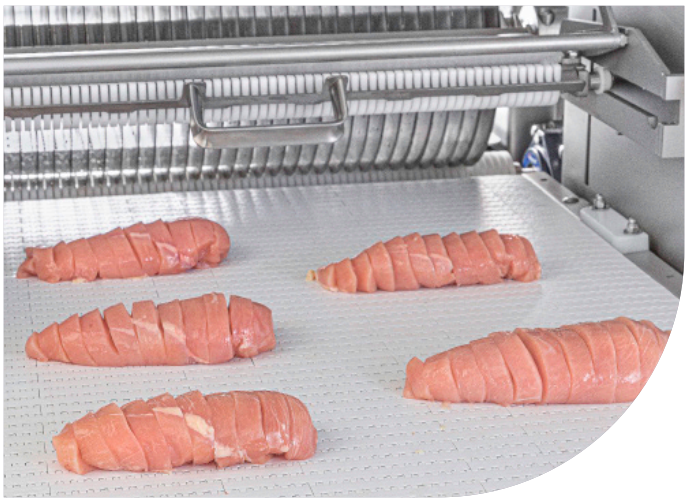
Profiling is a cost-efficient solution for producing identical portions for the food-service industry. Profiling is a way to make the best use of the incoming raw material to produce uniform, value-added portions.

The profiling process uses templates to ensure that products are cut to the required shape. Templates are available for different shapes and sizes of whole butterflies and half fillets. The machine can also be equipped with a rotating blade attachment to cut input material into equal width strips.

Flattening

As poultry portions are getting bigger, due to larger growing birds, they sometimes need to be adapted to the required weight and size of the end product. Flattening is one of the methods that can be used. JBT Marel offers various flattening solutions.

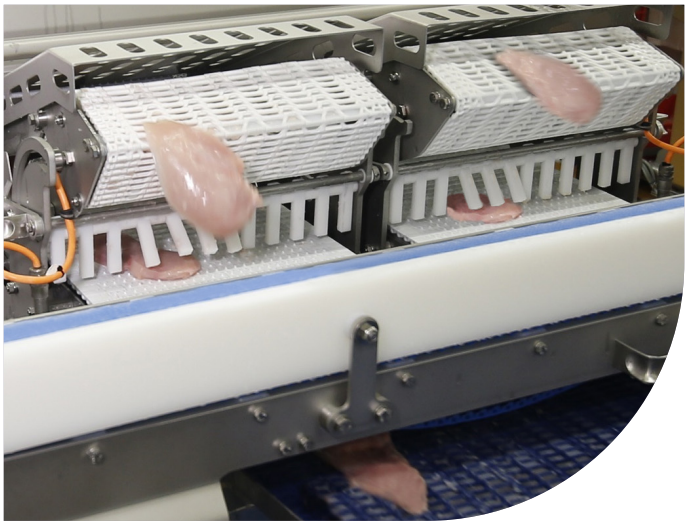
While maintaining their integrity, moisture and taste, the portions can be flattened to create the ideal shape and weight for end product purposes, such as schnitzels. JBT Marel's solutions put less pressure on the poultry by massaging it over a shorter period of time than other flattening equipment. This results in a high-quality bite, texture and taste.



Slicing

A JBT Marel slicer allows for cutting deboned breast or thigh meat into fixed-width portions at high speed. These can be strips, splits, steaks or dices. Multiple products can be cut using the same slicer configuration.

Cutting blades at fixed or adjustable widths give you more flexibility. Such a slicer can also be used to remove the keelbone from butterfly portions and to split large tenders from heavier products into two equal portions.



Horizontal splitting

It is possible to split poultry fillets horizontally into portions of uniform thickness. Both single and dual lane machines are available for both breast fillets and whole butterflies.

JBT Marel's horizontal splitters can be easily adjusted to give the required thickness, even differently set on each lane. They work extremely accurately.

Adaptive 3D portioning can be achieved when combining a horizontal splitter with a DSI waterjet cutter. Thanks to the dual lane scanner and sophisticated software, the most profitable use of each piece can be determined. The horizontal split will be adjusted accordingly. The best 3D cut will be completed in the vertically cutting waterjet.

"The demand for sized products keeps growing every day. As broilers get heavier, fillets also increase in weight. So we need more cuts which are accurately calibrated and sorted. These jobs require completely reliable machines and that's why we have chosen JBT Marel equipment such as the I-Cut in combination with the SpeedSort and the TSM Template Slicing Machine."

Werner Borgmeier, General Manager
H. Borgmeier GmbH, Germany

Sorting

Sorting follows the portioning machine, where it iden-tifies and discharges offcuts. A sorting machine can also be used to sort larger from smaller portions produced on portioning equipment. It saves labor and pays for itself quickly.

Sorting simply implies infeed and outfeed conveyors and a reject mechanism. The reject mechanism works so quickly that it can remove trim from both the front and back of the portioned product.

JBT Marel sorting machines are available for both single and dual lane applications and will handle all portioning throughputs. They can also follow SensorX and checkweighing equipment.

- Ultra high speed trim removal/product sorting
- Labor saving
- No human touching needed
- Rapid return on investment

Portioning Software

JBT Marel Software is not just about analyzing and controlling the portioning line. By ensuring communication between individual machines, it allows different systems to be integrated into the portioning process.

- **Remote control of portion cutters**
- **Real-time monitoring for quick remedial action and a reduction in giveaway**
- **Fully comprehensive reports for accurate historical analysis of both raw material and results**
- **Full traceability**

JBT Marel software gets the very best out of portioning equipment. Its easy-to-use software lets operators set up and change cutting programs.

This already starts with stand-alone equipment. Most JBT Marel portioning machines include advanced integrated software and touchscreen controls for easy programming. For example, the DSI Q-Link™ portioning software helps optimize the cutting strategy of the waterjet cutter.

Overarching JBT Marel portioning software can also be added, either to a stand-alone machine or to an integrated portioning line. Software modules like Order Manager and Traceability give central control of production, leading to optimized processing and complete traceability. The portioning process can also be part of a larger breast fillet optimization system, where ProFlow Breast Meat software plays an important role.

To ensure top portioning performance, the software offers a clear overview of the whole cutting process and its results. The graphical user interface shows what is running on the equipment, so the operator can quickly change programs or products, even remotely. It also creates reports on key factors like throughput, giveaway and overall efficiency.

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