

The background of the entire page is a photograph of a duck processing line. Ducks are suspended from a metal conveyor system. In the foreground, several ducks are shown with their legs tucked up, appearing to be in the scalding stage. The ducks are white and glistening. The machinery is made of stainless steel and includes various chains and rollers. The lighting is industrial and somewhat dim, focusing on the ducks.

The world of
Duck processing

The world of Duck processing

In many markets duck products are becoming more popular. Duck meat is tasty and offers a good and healthy source of protein. With the increase in world population, the increase in per capita consumption of proteins and the open world market, expectations for growth are positive.



Markets demand more, safer and an ever greater variety of end products. In many markets this leads to centralization, up-scaling and a more automated production. Producers are striving for higher efficiency and a reduction in costs. Everyday production must be able to run without problems with the highest possible up-time, the best yields achievable and predictable, lowest possible cost of ownership.

A lot of attention is also being paid to food safety and quality and of course to producing in a responsible way. Animal welfare, water and energy consumption, full traceability and good care of the raw material are important starting points.

High speed, high quality

For over more than 50 years, we at Marel are proving our strength in the global poultry industry, with technology for all poultry species, all production speeds and every level of automation. We offer transparent, efficient and controllable processing that offers full traceability of products. Of course our dedicated duck processing technology takes into account all unique aspects of a duck's anatomy and the common product and market requirements.

The result is a unique, modular and in-line solution, with an unrivalled level of automation, suitable for the highest possible production capacity, being 6,000 ducks per hour on one production line. A Marel duck processing solution empowers the consistent production of high yield, high quality products.



Of course we focus strongly on skin quality. Our efficient and effective waxing system can meet the highest possible requirements. It is the result of dedicated innovation. To us innovation is a core value; you can say it is in our DNA. We keep both feet on the ground and are deeply rooted in the poultry industry and its developments.

Over the years many newly developed solutions have set trends in the poultry processing industry. We are therefore proud of our proven technology.

Extensive product range

Marel offers the most complete and extensive product range of duck processing solutions in the industry. We offer solutions for live bird supply, stunning, defeathering – including waxing – evisceration, chilling, cut-up and deboning. Furthermore we offer equipment for high speed slicing, (fixed weight) batching, marinating, meat harvesting and further processing (including portioning, coating, frying, cooking and sausage making). We also provide various end-of-line solutions, like automatic weighing and labeling. Software solutions and spare parts & service products complete the picture. Our extensive global network guarantees an excellent and prompt service to our customers.



Your process

Laying out your process will of course depend on many factors. The production capacity required and the type of product you want to produce are naturally important. Your possible growth scenario, your export potential and the availability of skilled labor have also to be taken into account. Certain processes or parts of them can be done both manually as well as automatically.

The best solution

Our systems are modular in construction. This means many components of the production process can be scaled up. You will not need to replace all modules when extending. Subprocesses can be automated in phases.

We are able to offer solutions for all steps in the process and for every production capacity. Below you'll find descriptions of

several stages in the processing of ducks. In this way, you can picture the various in-line solutions possible.

In consultation with your sales manager and his team and on the basis of your requirements, your market and your circumstances, a specific solution is worked out. This solution will enable you to achieve your aims in the best way possible.





Process steps

Live bird handling

GP live bird handling system

- Most efficient container
- Animal-welfare friendly
- Safeguards duck quality
- Optimizes hygiene
- Labor saving and improved ergonomics

Smooth-running supply of live ducks makes a significant contribution to the overall efficiency of your processing plant.

The GP container, heart of system, provides effective and humane conditions for loading and transporting ducks from grower to processor.

The system's in-plant logistics meet the highest demands as far as line speed, hygiene and durability are concerned. The modular system can be adapted completely to your wishes.

There are various cleaning and disinfection options to limit the risk of cross-contamination to an absolute minimum.

We also provide a traditional crate handling system, which can be largely mechanized by using stackers and de-stackers.



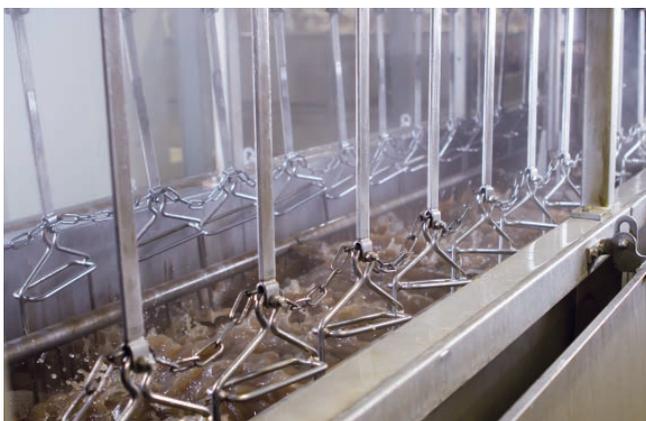
Stunning

Electrical Water Bath Stunning

- Effective and reliable high frequency stunning
- Suitable for all processing speeds
- Complete electrical safety

Ducks are stunned by guiding them through an electrical charged water bath. The special design of the infeed plate prevents pre-stunning to ensure a humane and effective stun.

The flexible high frequency water bath stunner complies fully with the existing regulations. After stunning a precise cut is applied for proper bleeding.



Scalding

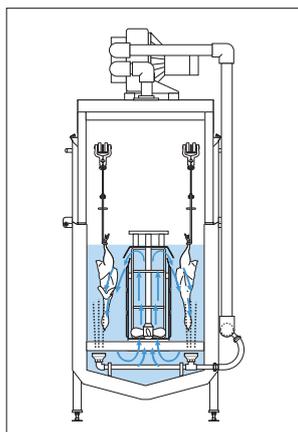
Immersion scalding

- Precise temperature control for a consistent processing result
- Multi-tank counter-flow for a cleaner process
- Low energy and water usage
- Designed for optimal cleanability

The scalding process largely determines the appearance, color and visual quality of your end product. It can also influence yield and shelf life.

Marel scalders ensure optimum heat transfer and precise temperature control, two vital characteristics of a first-class scalding system.

Duck scalders are equipped with an extra agitator to deal with the floating capacity of ducks. The agitator causes a downward water flow which keeps the ducks immersed for most effective scalding.



Defeathering

- Dedicated adaptable beam-pluckers
- Easily adaptable plucker speeds
- Individually adjustable beams for optimized result
- Frequency converters at breast side for optimum skin result
- Easy to set, maintain and clean
- Low cost of ownership

The way a duck is plucked is crucial to its presentation. Plucking action will also determine the extent to which the epidermis remains attached. Accurate plucking is especially important if whole ducks or portions are to be sold fresh and skin on. Marel has long experience of plucking, gained worldwide over decades and backed by solid research.

We offer pluckers allowing for adaptable individually adjustable beams with varying positioning. Frequency converters at the breast side also add to the optimization of the plucking result.

Our pluckers have long service intervals and the lowest possible cost of ownership per processed product.



Waxing

- Simple, top quality process
- Effective and fully enclosed
- Compact and efficient wax flow

Skin presentation on duck meat products should be perfect. Products should naturally be feather-free and there should be no skin damage either. Marel has long experience of waxing ducks and offers compact, fully enclosed and in-line systems for a double or triple process. The technology includes an efficient wax recycling system for all capacities.

After scalding and plucking, products are conveyed suspended from shackles through a bath filled with wax. They are then dipped in a tank filled with cold water, where the wax solidifies. The solid wax, which will contain down and pin feathers, is then removed automatically in a wax peeler. If necessary, the process can be repeated. The wax removed is melted down and feather residues filtered out. Clean wax is then recycled for re-use at the correct temperature.



Evisceration

- Efficient, consistent and hygienic process
- Highly automated evisceration
- Limitless layout flexibility

The entire viscera pack is removed completely in a single, automated operation. The viscera pack is hung over the breast side of the duck.

There is a wide range of equipment available for the various process steps in the evisceration department. Together they prepare your products in the best possible way for chilling and all other downstream operations.

Giblet processing

- Modular setup
- Optimum yield
- Optimum quality and hygiene

The viscera pack contains several valuable giblets. The system to process giblets can include solutions for washing, chilling and transport of products.





Feet processing

- Various in-line processing options
- Fully automated scalding, peeling and chilling set-ups
- Labor saving

Feet are profitable products; an effective processing system can therefore be an interesting option. The system processes feet fully automatically up to peeling and chilling. Its modular setup enables a profitable solution for every production capacity.



Chilling and maturation

- Effective chilling for all capacities
- Optimal product quality with high yield
- Unique 'plus'- technology

For optimum shelf life, quality, freshness and food safety, end products must be effectively chilled. We offer various technologies, which chill products to the correct breast core temperature without freezing wings or neck flaps. Weight loss is kept to an absolute minimum.

We provide a number of in-line air and immersion chill options, including the 'plus'- technology which sprays products with water. The systems enable the production of end products with excellent yield, quality and shelf life. The end product presents an attractive texture and color to the consumer.

We offer chilling solutions for all products, including giblets and feet.





Weighing, grading, distribution

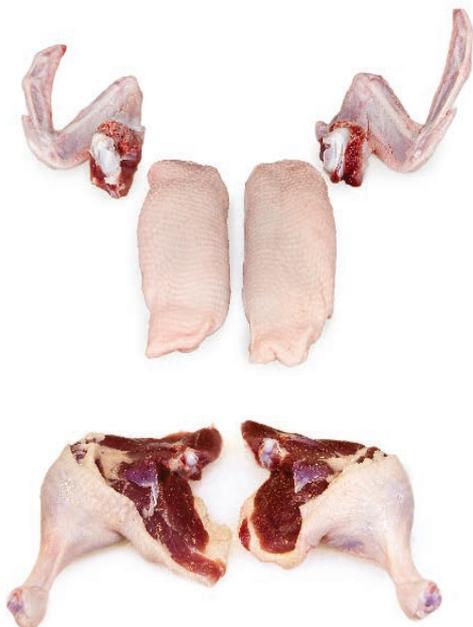
- Fast, accurate 'weight and vision based' selection
- Flexible distribution options
- Give-away reduced to an absolute minimum
- Specialized process control software

The weight and quality of products can be determined automatically, using visual inspection technology and weighing equipment such as the SmartWeigher. The gathered data compose the input for the plant production and control software. This also influences various downstream operations.

Automatic weighing, grading and distribution are important steps towards good in-plant logistics, full traceability, reduced give-away and improved yield.

Cut-up

- Unique, high yield automated cut-up
- Limitless layout and production flexibility
- Highest percentage of A-grade cuts



Our unique, automated high performance cut-up system is just as flexible as you need it to be. Providing various module options, the system offers an almost limitless production flexibility.

The system's product carrier positions products perfectly, even at the highest line speeds. Result is a system producing the highest yields and percentage of A-grade cuts in the entire poultry processing industry.





Deboning

- Optimum product flow
- Flexible layout
- Process and operator monitoring

The manual deboning of ducks is optimized by streamlining the supply of products to each operator. This task can be performed by a Deboning Cone Line or a StreamLine solution. Here a constant flow of products is guaranteed to optimize deboning operations. Through integration with Innova, Marel's production management software, yield and throughput of individual operators working at a StreamLine working station is monitored in real-time. In this way managers can make the necessary adjustments to ensure a maximum operating efficiency.

The flexibility of the line leads to a higher quality end product by giving processors the ability to maximize the selection of cuts into highest price products and to minimize loss.

X-ray inspection

Deboned duck meat can be scanned using advanced x-ray technology. SensorX detects the exact location of bone and other contaminants, enabling effective trimming. Products are re-scanned for extra safety. SensorX can add extra value to your product.

Batching

- Wide range of flexible and in-line solutions
- Extremely low give-away
- Labor saving

We offer all kind of batching solutions, including fully integrated tray loading and packing systems. The fully automatic Marel RoboBatcher packs products into trays at high speed.

It is known for its high-precision fixed weight batching with virtually no give-away.

Marel Multihead Weighers handle all in-feed, sorting, mixing and weighing requirements. They automatically portion and pack all types of fresh or frozen poultry products.





Portioning and slicing

- Multiple cutting possibilities
- High accuracy
- Minimal product give-away
- Reduces labor costs

Good portioning and slicing is all about automated, high-speed, high-precision performance.

We offer portioning and slicing solutions for the high-speed production of all kinds of fixed weight or fixed length products.

The range of machines also covers horizontal and template slicing of fillets. The equipment is designed to live up to your need for uniform, natural looking end products.

High-precision performance results in minimal give-away, thereby providing excellent profit opportunities.

By combining the equipment with Innova intelligent production software, remote programming and control are easy. The software allows for real time monitoring and it produces reports based on actual performance.

Meat harvesting

- Adding more value to your carcasses
- Harvesting of good quality raw material
- Adjustable pressure and press times
- Easy to operate and to clean

Our goal is to add maximum value to every bird. Our meat harvesting equipment allows you to harvest any remaining valuable meat from e.g. carcasses or necks.

Mechanically deboned meat provides a profitable source of good quality raw material for the sausage, snack and comminuted meat industry.

We provide highly efficient durable meat recovery systems requiring only a minimum of maintenance, which are easy to operate and clean.





Marinating and tumbling

- Fully automated in-line process
- Uniform distribution of additives
- Easy tracking and tracing of batches

The market for seasoned, ready to cook and ready to eat products continues to grow. It is very popular to marinate and garnish all kinds of bone-in and deboned products. These techniques add value to your products and offer interesting possibilities in virtually all markets, with new tastes and applications being introduced all the time.

With our massage and marinating solutions you can process small batches in-line, either wet or dry, larger or smaller products, with or without bone and with or without additives.

Keeping this process in-line does away with the need for manual product handling operations. As tracking and tracing is easier, concerns about logistics are no longer an issue.

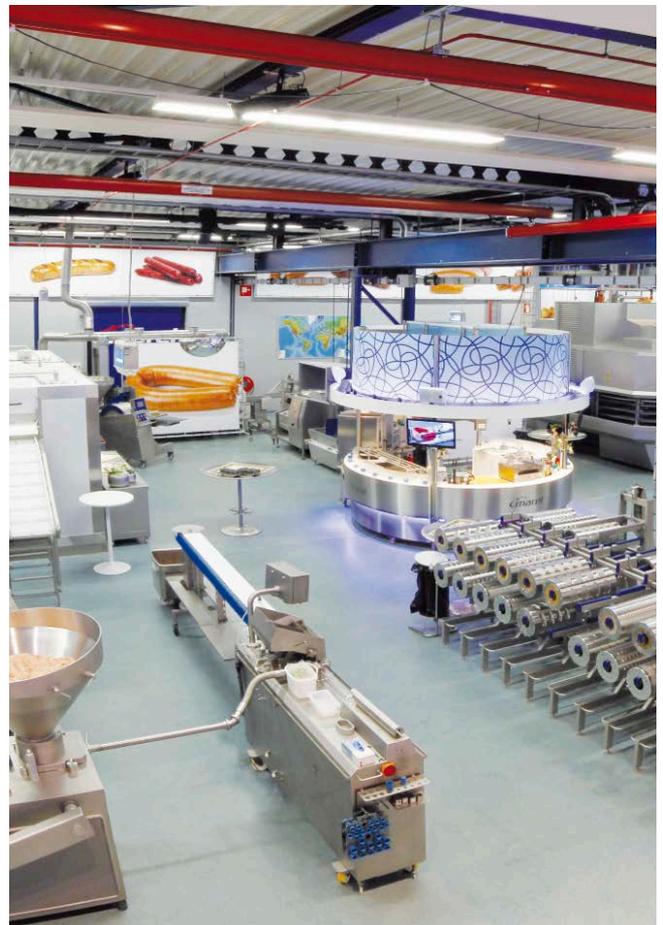
Further processing

- Full line solutions
- Modular, flexible set-up for all desired capacities
- Wide product range

With decades of experience in food technology and animal protein processing, Marel develops, manufactures and installs innovative systems for the further processing of animal proteins.

The product range includes full line solutions from meat preparation to sausage production, from portioning and coating to frying and cooking. With your end product and all its specific characteristics as starting point, specialists put together the most effective system to meet your requirements.

In our DemoCenter your production facility can be mimicked to create the products of your choice. In this way you will gain valuable insight into the technologies you consider buying. You can learn, see, feel, smell and taste how your wishes and expectations are translated into attractive end products.





Internal logistics

- Smooth product flow
- Reduces labor
- Safeguards quality: reduced product touching

Good internal logistics improve the flow of your end products, safeguarding quality in the various process steps. We offer various types of conveyor belts and overhead conveyor systems which connect process steps in the most efficient way possible.

Besides bringing product safely to the next process step, the aim can be to reduce the number of times the product is touched by operators. One way of doing this is to use conveyor belts which automatically position the products correctly for in-feed into a downstream machine.



Packaging and end-of-line

- Digital weighing accuracy, precision and reliability
- Labeling solutions for a wide range of products and capacities
- Easy label editing with drag and drop touch screen

End-of-line systems perform the final operations to complete the packing process and provide customer specified presentation. The equipment comprises a combination of well-proven elements and can be tailored to your requirements.

Marel labelers provide base, top, side, single, double or 3-panel application, non-contact or in-line printing and application.

Our weigh price labelers provide excellent performance with low running cost through class leading print head life. Designed for a wide range of applications, they can handle most current pack sizes at up to 160 packs per minute.





Process control software solutions

- Control
- Monitor
- Improve

INNOVA
Food Processing Software

Highly automated processing requires ever more production control and management information. When it comes to optimizing profits and overall production performance, we provide a complete management solution.

Our modular software packages can cover the complete value chain in the production cycle, from the receipt of input material right up to dispatch of the end products. Innova is the modular production control software for Marel equipment, focusing strongly on those parts of the process where products are transported in shackles suspended from the overhead conveyor.

Innova provides key performance indicators (KPIs) relating to every stage of processing, enabling users to control, measure and monitor virtually every aspect of the production process.

Using Innova production control software, Marel is able to offer the most extensive and best process control solution for all poultry processors.

Rendering and waste water treatment

Transport

Blood, feathers and other slaughter offal must be transported and collected rapidly, effectively and hygienically. For this we offer various options, ranging from simple pumping systems to extensive vacuum transport systems, including in-place cleaning and disinfection.

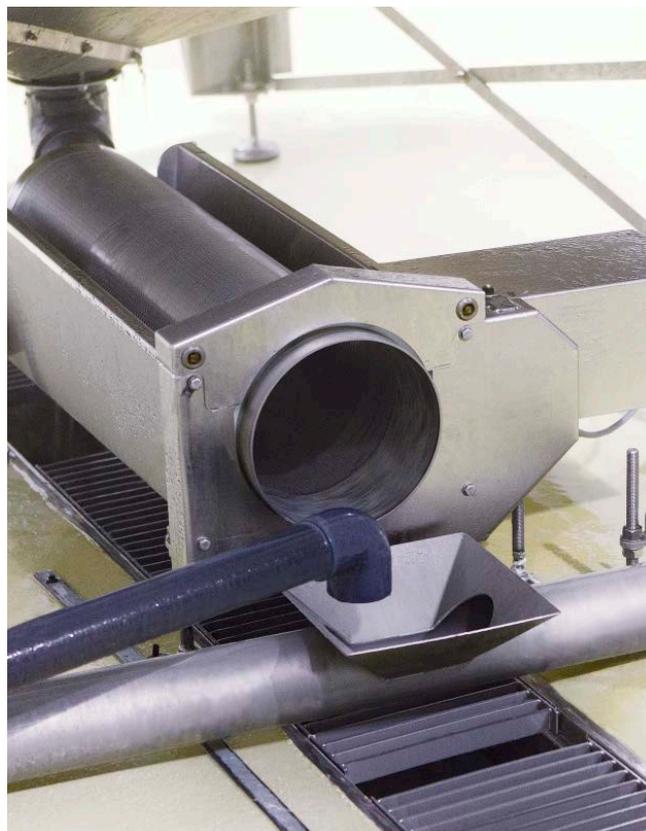
Rendering

Some slaughter offal is particularly rich in proteins and fat. We provide a range of systems for the rendering of feathers and slaughter offal, thus producing attractive base materials for other industries.

Waste water treatment

Extending the product range for the poultry processing industry, we offer various solutions for the treatment and purification of process and waste water, tailor-made to suit specific requirements and levels of pollution.

For rendering and waste water treatment solutions, Marel has the best knowledge and engineering in the industry available in house.





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**In partnership with our customers, we are transforming the way food is processed.
Our vision is of a world where quality food is produced sustainably and affordably.**



**TRANSFORMING
FOOD PROCESSING**

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