

The world of duck processing



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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 PMJ 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. With deep roots in waterfowl processing equipment, Marel PMJ delivers designs fine-tuned to your unique needs. 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 unrivaled level of automation, suitable for the highest possible production capacity. Our full range of state-of-the-art systems enables you to process from 500 up to 7,000 products per hour. A Marel PMJ duck processing solution empowers your consistent production of high yield, high quality products, so you stay ahead of the competition.

Of course we focus strongly on skin quality. Our efficient and effective waxing system, including unique Three-Point Suspension, 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.

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. We focus on the continuation of your operation. With a well-thought-out spare part stock and maintenance schedule, we minimize your downtime and optimize your efficiency. Knowing your end product and understanding waterfowl processing makes Marel PMJ your ideal partner in supporting your operational processes.



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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

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.

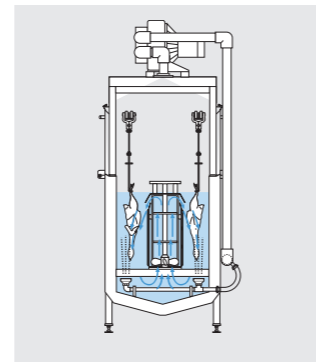
The system's in-plant logistics meet the highest demands as far as line speed, hygiene and durability are concerned. The modular system can be adapted completely to your wishes.

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.

Benefits

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



Stunning

Stunning is a crucial step in the process, to create a high-quality final product. In an effective and reliable, controlled manner, Marel PMJ's water bath stunner will process ducks, in full compliance with regulations while significantly improving quality and reducing manual labor.

The control panel allows the adjustment of frequency and voltage in a stepless way to achieve the optimal stunning settings. At the same time, animal welfare is safeguarded and meat quality is preserved. The time inside the machine and the easy finetuning of settings will guarantee a relaxed product. The birds will bleed easily and the plucking result will improve thanks to less stressed birds.

After stunning, Marel PMJ's automatic carousel machine applies accurate incisions at each side of the neck. This results in maximum bleeding while keeping trachea (air pipe) and esophagus (feed pipe) intact. A throat cut (halal) is also possible.

Benefits

- Always the ideal (predefined) settings for your product
- Stepless frequency setting
- Safeguarding animal welfare and preserving meat quality
- Suitable for all processing speeds
- Real-time dashboard and data logging

Scalding

Immersion scalding

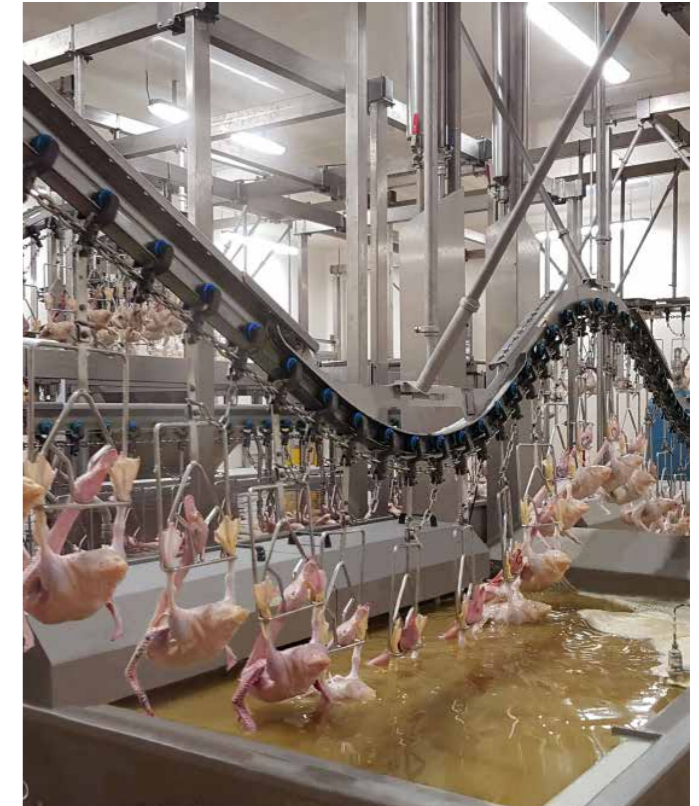
The scalding process largely determines the appearance, color and visual quality of your end product. It can also influence yield and shelf life. Marel PMJ immersion scalders ensure optimum heat transfer and precise temperature control, two vital characteristics of a first-class scalding system creating perfect conditions for the plucking systems.

Marel PMJ's pre-scalder removes the majority of dirt and other small particles from the feather pack in this stage, thereby preparing much cleaner conditions for the main scalders.

Duck scalders need extra agitation to deal with the floating capacity of ducks. The agitator causes a downward water flow which keeps the ducks immersed for most effective scalding. Due to the balance between water and the amount of agitated air to loosen the feathers, ideal equal heating around the product's skin is realized without overheating the tail or breast skin.

Benefits

- 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



Defeathering

The way a duck is plucked is crucial to its presentation and determines 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.

We offer in-line pluckers allowing for finetuning to a wide variety of ducks and waterfowl. A Contramatic Plucker or Attack Plucker removes the majority of the feather pack. The Finisher Plucker removes the remaining feathers, ensuring a perfect overall plucking result. Frequency converters at both sides also add to the optimization of the plucking result.

When duck sizes, shapes or weights vary largely within a flock, Marel PMJ's drum plucking solution delivers the best possible result. The modular setup can be configured to match every capacity and product type perfectly. This rotary-type plucker includes head and feet and offers an automatic loading and discharging system as well as easy pluck cycle and speed settings.

Benefits

- Dedicated off-line and in-line adaptable pluckers
- Easily adaptable plucker settings
- Long service intervals and low cost of ownership

Waxing

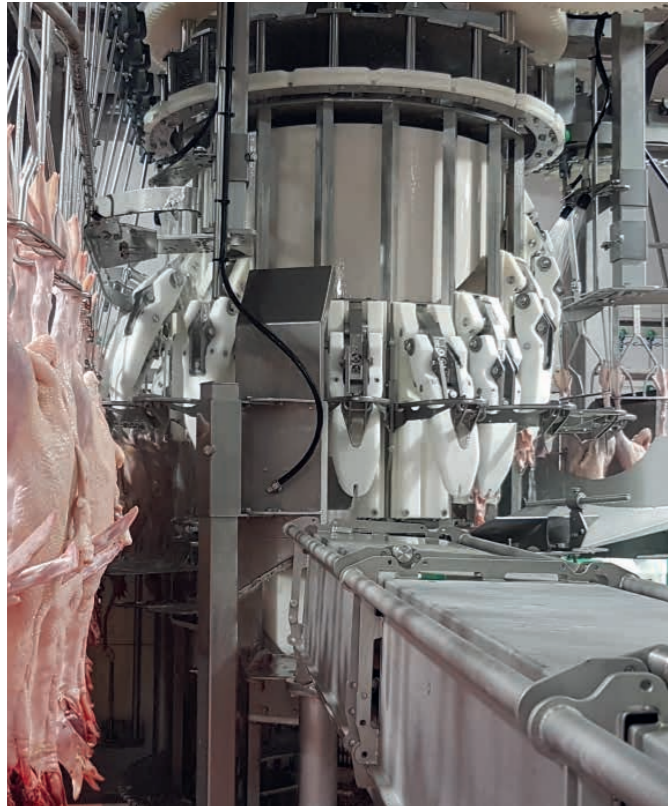
Skin presentation on duck meat products should be perfect. Products should naturally be feather-free without skin damage. The waxing process takes care of this. After plucking, Marel PMJ's unique Three-Point Suspension machine automatically suspends the heads in the middle slot of the shackle. This prevents wax from entering the beak. Now products are ideally positioned for a short dip in the hot wax immersion tank, to prevent overheating. After this, products are submerged in the cooling basin, allowing the wax layers to cool down quickly and solidify for easy removal. Now the heads are released again and the product, suspended by its feet only, is ready for optimal wax removal. The wax remover peels the solidified wax, including down and pin feathers.

Wax recycling

Marel PMJ's wax recycling system removes the feathers, fat and other small particles from the used wax. The wax returns to its original structure and characteristics without overheating. This fully automatic recycling loop minimizes wax consumption per product, improves wax quality and reduces waste.

Benefits

- Accurate temperature control per tank
- Equal distribution of wax
- Double plated insulated walls and floor save energy
- Gentle but effective wax removal
- Wax reclaim system for recycling



Evisceration

Prior to evisceration, the Opening Machine will slice the skin open after vent cutting from the back in the direction of the breast-bone. The opening will be just big enough to let the spoon of the Eviscerator enter the carcass.

The Eviscerator separates the giblet pack from the carcass in a very precise yet resolute way. The giblet pack is directly transferred from the spoon to a separate pack conveyor belt to minimize the risk of contamination. The pack conveyor is synchronized with the product conveyor to make veterinary inspection easy and effective.

After the eviscerator, various machines stand ready to complete the process. They carefully handle the area between carcass and head. Esophagus and trachea are removed, the neck skin stays with the product, while neck and tongue are harvested. The Final Inspection Machine removes lungs and debris from the rib cage using vacuum, and finally the Inside/Outside Washer wraps up the evisceration process.

Benefits

- No contamination - pack and product processed separately
- Available in several capacities up to 7.000 ducks/hour
- Easy adjustable to a wide range of product sizes and weights
- Elaborate automated pre- and post-eviscerator operations



Giblet processing

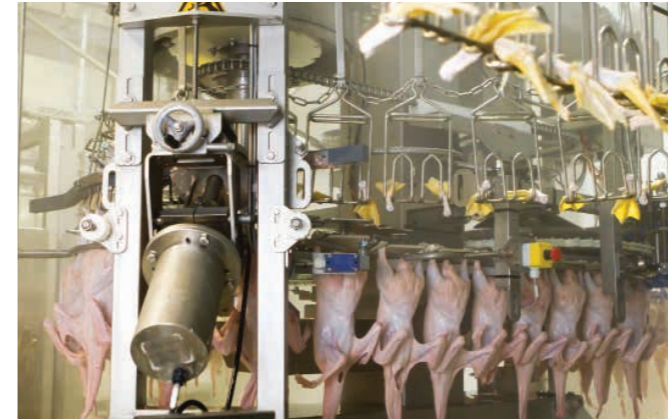
The giblet pack is collected in a tray and synchronized with the shackled product to achieve a proper presentation to the veterinarian for easy and effective inspection.

The semi-automatic Heart-Liver Separator automatically separates the heart and liver from the viscera pack by a circular blade positioned close to the carrier. The Gizzard-Intestine Separator harvests the gizzard from the pack without damaging the product. The Gizzard Washer cleans the gizzards by removing the surplus of fat and fatty tissue from the product. The Gizzard Lobe Cutter separates valuable lobes from inedible parts. Optimal positioning of the gizzard results in an above-average cutting yield. The Gizzard Finisher gently removes fat and other external remnants from the gizzard.

When harvesting tongues, a tongue scalding and skinner are available.

Benefits

- One tray, one pack - no cross-contamination
- Easy and effective pack inspection - synchronized with product
- Versatile design, adaptable to requirements in terms of giblet harvesting, inspection and level of automation
- Suitable for a wide variety of products, shackle pitches and capacities (up to 7.000 ph)



Feet processing

Feet are profitable products; an effective processing system can therefore be an interesting option. The feet processing line includes scalding, peeling and chilling. Removing the yellow feet skin is usually a labor-intensive operation. Marel PMJ's fully automatic system, however, succeeds in thoroughly skinning the duck feet without any human intervention. Thanks to its modular setup and flexible integration options, Marel PMJ offers a profitable solution for every production capacity and for every market.

Benefits

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



Chilling

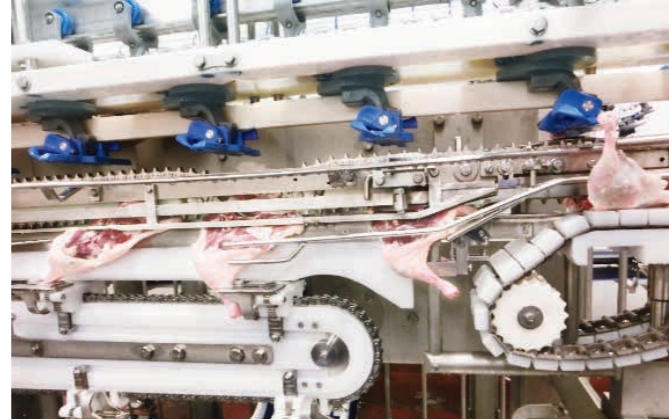
For optimum shelf life, quality, freshness and food safety, end products must be effectively chilled. We offer various technologies, which chill products to the correct breast core temperature without freezing wings or neck flaps. Weight loss is kept to an absolute minimum.

We provide a number of in-line air and immersion chill options. Air chilling includes 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.

Benefits

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



Weighing, grading, distribution

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.

Benefits

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

Cut-up

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.

Benefits

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



Deboning

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.

Benefits

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



Batching

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.

Benefits

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



Portioning and slicing

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.

Benefits

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



Meat harvesting

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.

Benefits

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



Marinating

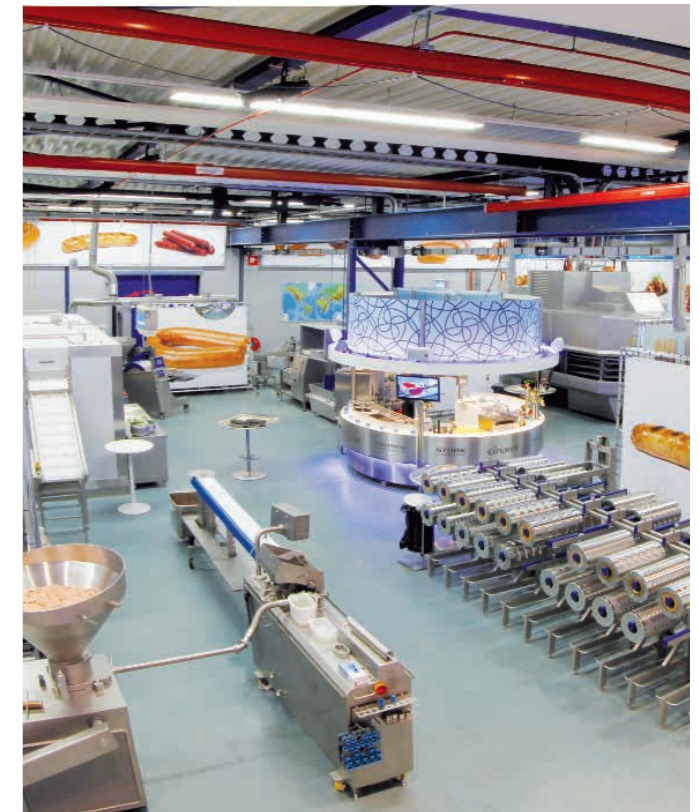
The market for seasoned, ready to cook and ready to eat products continues to grow. It is very popular to marinate and garnish all kinds of bone-in and deboned products. These techniques add value to your products and offer interesting possibilities in virtually all markets, with new tastes and applications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

Benefits

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



Further processing

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.

Benefits

- Full line solutions
- Maximum utilization of raw material
- Modular, flexible configurations are possible to produce a wide range of convenience food products
- Your end product is our starting point



Internal logistics

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.

Benefits

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



Packing and labeling

At the end of the line, packing and labeling 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.

Benefits

- 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



Process control software solutions

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.

Benefits

- Control
- Monitor
- Improve
- A software solution-small or extensive-for every process or process line



Rendering and wastewater 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.

Wastewater treatment

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

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

Benefits

- A sustainable way of processing offal and wastewater
- Maximum utilization of resources
- Expert in-house knowledge
- Tailor-made solutions possible for every situation

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