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Introduction

MARELEC Food Technologies started with MARine ELECtronics for the trawler industry. Soon after, robust yet reliable weighing and sorting systems for the fish industry were developed both for use on shore as well as at sea. The unique features such as the high speed, precision and the custom design were then integrated into solutions for the meat and poultry industry. Nowadays, we are world leading in designing and producing highly advanced weighing and sorting systems as well as intelligent portioning machines.

We kindly invite you to browse through our brochure to find out more about the different models, applications and our unique selling points. Our brochure will also identify which model is most suited for your needs and products. Our sales team is ready to answer any questions you may have.

As we are a worldwide leader with this technology and regardless of the GRADER that you need, your choice of MARELEC will ensure that you are working with a service oriented company, one that listens to your specific needs and a flexible partner with a human approach. We look forward to our cooperation!





Unique Selling Points

The MARELEC Grading Solutions combine state of the art technology for creating highly advanced accurate and fast grading solutions.

1 // INTELLIGENT BATCHING ALGORITHM

The MARELEC intelligent batching algorithm keeps track and makes combinations of the different weights to fill the stations to the target batch weight, with an absolute minimum giveaway. MARELEC gladly runs a simulation to determine the optimal number of stations for your application.

2 // MODULAR CONCEPT

MARELEC grading systems are built with modular key component parts. This reduces the amount of spares and guarantees a swift maintenance with minimal downtime.

3 // USER FRIENDLY SOFTWARE INTERFACE

The interface allows quick, user friendly and intuitive programming. Over 100 programs can be stored.

4 // HYGIENIC DESIGN

The graders have a completely open structure, without hidden corners, for complete cleaning and disinfecting. Horizontal surfaces are avoided. Batching stations can easily be opened. All electrics and electronics are in completely sealed cabinet with a unique hygienic labyrinth double sealing. All materials used are FDA approved.

5 // WIDE RANGE OF SEPARATION METHODS

Speed, type and state of the product are crucial for choosing the adequate separation method. MARELEC offers a complete range of separation methods: pull arms, kick arms, tilting conveyors, pushbars, retract conveyors, etc.

6 // STAINLESS STEEL DRUM MOTORS

To avoid housings and reducers, all motors used are silent stainless steel drum motors with IP 66 or higher protection.

7 // SERVICE

MARELEC has built a very strong reputation for its after sales service. A team of service engineers is available 24/7 to reply to your queries. All MARELEC grading systems can be connected to the internet, which allows our service team to diagnose the status of the machine from our head office. This puts us in a position to react on the spot to assist you.

8 // LOW NOISE

The grading machines have the lowest noise level during operation. This creates a pleasant environment for the operators.

9 // FLEXIBLE DESIGN

A team of experienced engineers translates the requirements and specific needs of the customer into a grading system that is custom designed and built. This flexible approach guarantees the exact solution for the application keeping the maximum throughput as priority on the minimal footprint.

10 // WORLDWIDE SUPPORT

MARELEC has a network of exclusive distributors throughout the world, with fully trained and qualified engineers to assist our customers whenever needed.

11 // PRODUCTION REPORTS

Production data can be viewed on the grader HMI. The user friendly MATRIX program stores processing data on an office PC for traceability. MATRIX also allows to control the grader remotely.



Overview

1 // INFEED

Various infeed systems are available to suit your application and capacity. For a complete overview go to page 10.

2 // SEPARATION METHOD

Speed, type and state of the products determine the ideal separation method: pull arms, kick arms, tilting conveyors, pushbars or retract conveyors.

3 // OUTPUT

The graded products can be sorted straight into boxes or via various types of batching bins, presentation trays, bag holders or perpendicular belts.

4 // HYGIENIC DESIGN

All grading systems have a completely open structure, without hidden corners, for complete cleaning and disinfecting. Horizontal surfaces are avoided. Batching stations can easily be opened while being mounted on the grader.

5 // TAKE-AWAY

A take-away conveyor underneath the grading stations transports the batches from the grader towards a dedicated packing area.



6 // REMOTE SERVICE

The grader can be connected to the internet, which allows the service team to diagnose the status of the machine. This on a 24/7 service.

7 // PROTECTION COVER

The sensitive weighing section is protected by a cover to avoid that winds or current drafts would affect the correct measurement. This cover also protects the weighing belt and loadcell from mechanical overload.

8 // TABLES

Tables can be mounted underneath the stations to hold the trays or containers. Elevation systems are available to bring the tables at ergonomic height for the operators. There are options to swing the tables away, so a trolley or tub can be placed.

9 // LABEL PRINTER

Label printers can be mounted between the stations to print labels with traceability information such as processing data "best before", batch weight, ... for each batch.

10 // MATRIX

MATRIX software is a tool to optimize processing performances and profits. This includes a cockpit view on real-time parameters: yield, throughput, give-away, stock movement, profitability and user programmable KPI's.

Infeed Systems

Infeed system *	Application	(pieces/min)	
		Capacity **	Dimensions ***
In-line	Packed products		
	Whole fish / fillets	50 - 120	100 - 1200mm
	Frozen, fresh & live		
Slotted in-line	Fresh fish fillets Langoustines (in conjunction with retract grading system)	60 - 150	≤ 500mm
Circular	Live lobster	60 - 80	
	Frozen fish fillets	80 - 120	≤ 500 mm
Perpendicular z-conveyor	Whole fish Headed and gutted fish Marine	120	< 400mm
		100	340-500mm
		50	800-1200mm
Specie / quality selection pockets on top of z-conveyor	Salmon	50 - 100	
	Marine	50	500 - 1200mm
Z-conveyor over circular infeed	Sea bass / sea bream	150	< 450mm
	Frozen fish fillets	110	400-500mm

* Please contact MARELEC sales department with your product specifications. We gladly help to select and design the optimal infeed system.

** Actual capacity depends on dimensions and state of the product

*** Dimensions (length) are subject to change depending on the products

Compact Grader

Compact means infeed, weighing and grading on one belt and one frame. The MARELEC M3 compact grader is an easy to use, simple and robust solution. All of this with the same precision as the classic graders.

With the MARELEC M3 compact grader, MARELEC sets the new standard for smaller versatile grading systems using pull arms and available with 6 or 8 stations, combined left and right. Options such as batching are available on request.

1 // MARELEC M3/6P

Equipped with a 250 mm wide belt and 6 stations, for smaller products.

2 // MARELEC M3/8P

Equipped with a 300 mm wide belt, 8 stations and higher flippers for larger products.



	M3/6	M3/8
Gates	6	8
L x W x H(belt)	3235 x 643 x 825 mm	4185 x 693 x 825 mm
Product dimensions W x L	240 x 400 mm	290 x 400 mm
Product weight	15 gr - 1,5 kg	100 gr - 3 kg
Options	<ul style="list-style-type: none"> MATRIX CG Label printer: MARELEC PR1 or PR2 Stainless steel 316 Infeed belt Batching 	

Flowscale

MARELEC offers the best equipment for flow weighing. These systems are able to weigh accurately a flow of products, e.g. pelagic fish or ice, over a certain period of time. This eliminates the need for collecting raw material in trays or tubs for weighing and gives a continuous raw material throughput.

The MARELEC M1-F100 has a capacity of 100 ton/hour. The machine can be used on shore or at sea (optional).

The flow of raw material is continuously weighed with the conveyor belt running and weighing results are added up to a total.

The machines are developed to be used in the most severe marine environment, and in this way accurate and fast weighing is always assured.



Grading after portioning

MARELEC has become the world leader with the intelligent portion cutter PORTIO. The PORTIO scans the fish fillets or whole fish using advanced laser and camera technology. With the exact shape, volume and density known, the software calculates instantly where to cut to obtain a portion of the desired programmed fixed weight.

To optimise yields, multiple target weights can be programmed on the PORTIO. To group the different weights together, a grader is put in line with the PORTIO. The Outfeed Product Holder on the PORTIO separates the portions and the acceleration conveyor of the grader provides the correct distance between the portions to optimise the maximum capacity by consistent feeding to the weighing unit. To handle fragile portions, MARELEC uses retractable belts to maintain the quality of the product.

The graders in line with PORTIO consist out of a wide range of designs. Customised solutions for special applications, e.g. trim tables, storage of boxes etc. can be designed according to your specific needs.



Grader on vessel

Adding value at the very start of the processing line can be done by grading on board. On-board graders have an active motion compensation which always gives accurate readings even at the roughest seas. As available space on a fishing vessel is always limited, MARELEC offers tailor made designs that suits the wishes of the customer. Even at sea, MARELEC can provide remote service in case technical assistance is needed.

1 // POCKET SYSTEM

Each fish is individually placed into a V-shaped pocket. This guarantees a constant speed and allows to separate species or to grade according to quality. The pockets can also be equipped with weighing cells.

2 // MOTION COMPENSATED

To weigh and grade accurately on board of a fishing vessel, on-board graders are equipped with active motion compensation which allows accurate readings independent from the motion of the ship.

3 // SPECIE SELECTION SYSTEM

When multiple species are caught on board, they need to be separated before grading. This is done using pockets or on the screen on the scale.



Aquaculture

MARELEC has a wide installed base of grading solutions for seabass and seabream in aquaculture. The complete line starts from the tub lifter that drops the fish and ice into a washing tank. An elevation conveyor automatically brings the fish to the de-icing grid, where an operator puts the fish into the pockets of the infeed conveyor. This pocket system guarantees the optimum spacing in between the fishes to assure of having the maximum capacity on the weighing unit.

The grader uses pull arms for gentle sorting of the fish into the batching bins. Boxes can be filled with a fixed number of fishes of a programmed weight range or to a total weight per box, with an absolute minimum of give-away (intelligent batching). Once the box is full, a label with all production details is printed and the box is pushed onto the exit conveyor. MATRIX software can be connected to make detailed production reports.



Salmon

Yield and speed are important for any processor in the salmon industry. MARELEC covers a range of weighing and grading systems from the reception of the fish to the end of the line. This means that the weight of every single fish or the total amount can be recorded at the reception. This is also possible after gutting, filleting, skinning, ... The MARELEC equipment allows to divide the salmon flow into different sizes and qualities. At the end of the line, the packing can be done in tubs, boxes or bags, depending on the need. Intelligent batching is available on all machines to minimize giveaway or excess weight.

1// POCKET SYSTEM

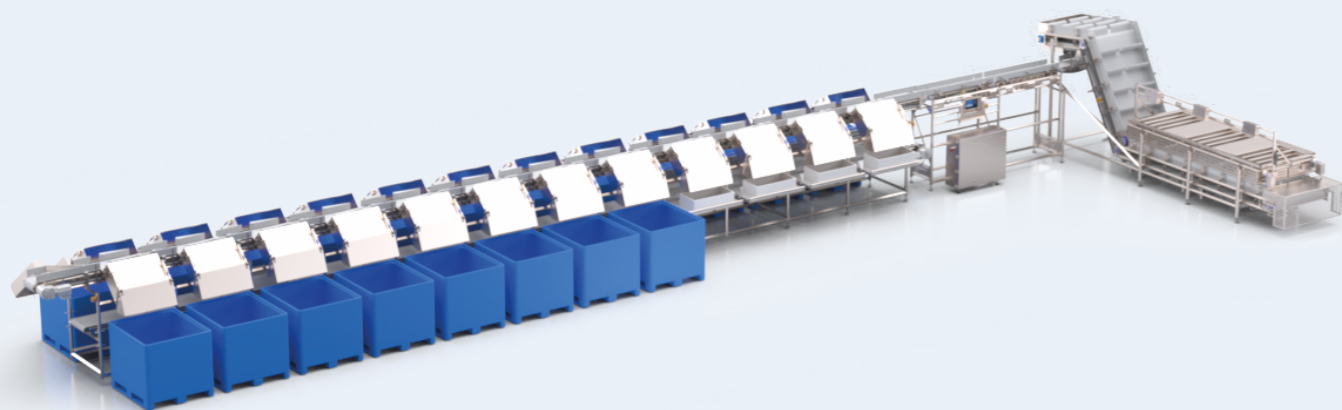
Each salmon is individually placed into a V-shaped pocket. This guarantees a constant speed and allows to separate species or to grade according to quality. The pockets can also be equipped with weighing cells, which will reduce the footprint significantly.

2// QUALITY SELECTION

When placing a salmon into a pocket, the operator has the possibility to allocate a certain quality rating to that pocket, by pressing the corresponding button on the control panel which is located right above the pockets. The grader will now sort by weight, yet keeping the same quality grades together.

3// LOW ANGLE BATCHING

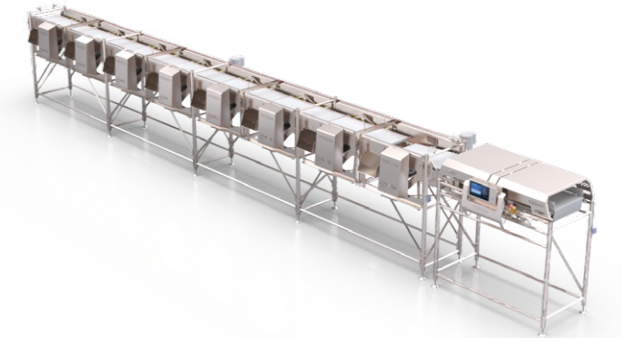
In order to keep the quality from the products the batching bins are designed to gently receive the products. The low angle batching can be customised according the product state (frozen, fresh, packed, ...).



Other applications

1// LANGOUSTINES

To make sure that fragile products do not get damaged during the fast grading process, MARELEC Grading Systems use retractable belts for gentle handling and to maintain the quality of the products such as langoustines. The gentle handling is one of the key-features that ensures a fast pay back on the equipment.



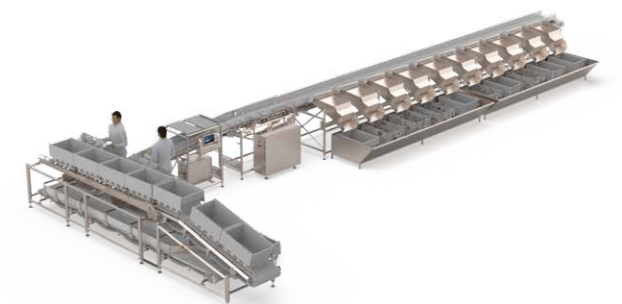
2// CRAB

Valuable crabs need to be graded at high speed. When cooked, batching bins with low angle guarantee a smooth handling. Special batching doors are designed to fill the boxes to target weight using the intelligent batching software.



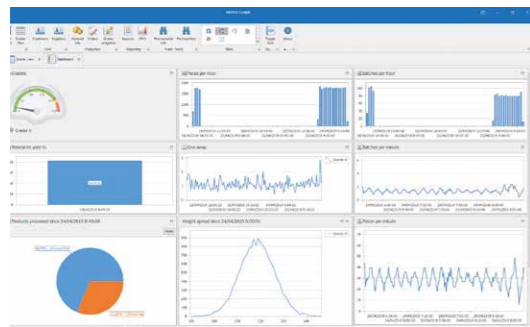
3// LOBSTER

Grading of live lobsters requires specially designed custom made solutions. Full crates, straight from the basins are automatically transported towards the operators. Coloured marked infeed belts help the operators to space the lobsters at the exact distance to run the grader at its full capacity. The lobsters slide gently over low angle exits into the crates which are placed into tanks filled with water.



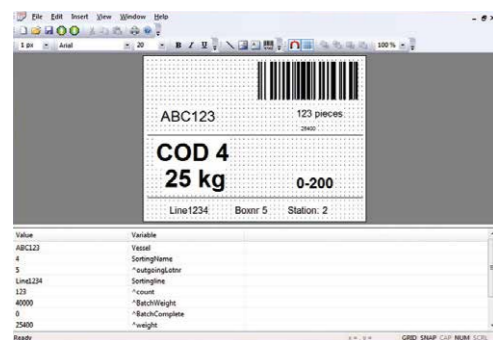
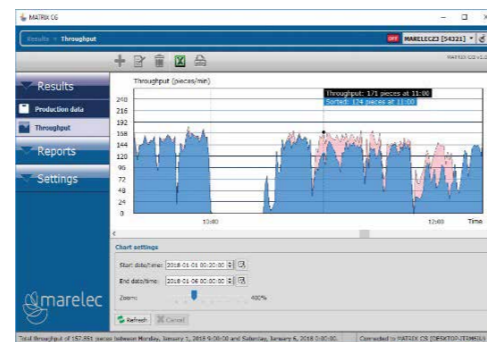
MATRIX

Food processors continuously search ways to stay competitive in a rapidly changing market. The food processing industry is driven by digital transformation. Processors rely on data analysing to define where to make improvements in their processes. MATRIX is a tool that not only gathers production data but also allows to remotely control devices on the work floor.



The all known KPI's such as yield, throughput, give-away, quality, ... have a huge effect on the competitiveness and profitability. The consequences of a process adjustment can go both ways so real-time feedback is very important. MATRIX enables users to visualize those KPI's in a real-time dashboard view. With this tool, crucial decisions can be made on the spot and be evaluated right after implementation.

MATRIX shows the Overall Equipment Effectiveness. Uptime or availability of a processing line is one of the key factors that can be improved with MATRIX. Changes in machine settings will be stored in an event log that will inform the user of any downtime so preventive maintenance can be planned accordingly. All production data collected by MATRIX is stored into production reports to help management to make strategic decisions.



Traceability is crucial when grading and packing. When the raw material information is entered at the front of the line and is tracked and traced through production, the appropriate label can be applied on the customer package. MATRIX includes a user friendly label design program to customise labels. MATRIX allows to trace products from finished packages back to their origin of the incoming raw material.

MATRIX can monitor a single device by the use of MATRIX CG program or control a whole processing facility containing both MARELEC and third party machines by the use of the MATRIX. MATRIX is a modular system that is customized according to your needs.

Demo

// SEEING IS BELIEVING

MARELEC Food Technologies has a state of the art demonstration room where customers are welcome to test the Grading Solutions with their own products. We strongly believe this is the best way to convince our dear customers of the accuracy, capacity and the obtained yields, gains and fast return on investment.

Please contact the MARELEC sales team to make an appointment. We will make sure to have the correct machine for your application available for a successful demonstration.





MARELEC Food Technologies

Redanweg 15 - 8620 Nieuwpoort - Belgium - T +32 58 222 111 - sales@marelec.com