

# INTELLIGENT PORTIONING SOLUTIONS

Food Service and Case Ready



- ▶ **High-performance portioning**
- ▶ **Precision and accuracy**
- ▶ **Continuous production flow**
- ▶ **Full yield control - reduced give-away**
- ▶ **Maximum utilization**

**NEW**  
PATENT PENDING  
360° VISION SYSTEM



**Marel**

## Precision

Suitable for use with beef, pork, lamb and almost any other meat, the Marel IPM III LaserEye Intelligent Portioning Machine is the ideal solution for high-value portioning of steaks into pre-defined weights and shapes.

Using the latest in 3D laser vision technology, the IPM III LaserEye automatically evaluates each piece before cutting, and then calculates the most economic cut configuration based on parameters pre-selected by the production manager, using only a few keystrokes on the unit's Marel M3000 graphical colour controller.

## Performance

Over two decades' experience at the cutting edge of food processing technology has made Marel not only one of the world's leading developers and manufacturers of intelligent processing equipment, but also an innovative producer of total production solutions specifically tailored to meet the needs of individual processors. Like all Marel equipment, the IPM III LaserEye is capable of operating as an independent unit, or as part of a complete Marel processing system. At the same time, experience has shown that using the IPM III LaserEye in a system incorporating Marel intelligent batching can enable processors to achieve up to 100% steak utilisation, with virtually no give-away.

## 360° vision system

**NEW**  
PATENT PENDING



## Multi-view vision system

The Marel multi-view vision system provides a full 3D image of products. Using 2 cameras and 2 mirrors the system performs a full 360° scan of each primal before cutting. Offering high resolution scanning the system is able to scan at a frequency of up to 200 Hz, delivering 1024x1024 pixel images. The high-density 3D grid has therefore no more than 1 mm between measurement points.

## High-precision cut

The multi-view vision system ensures a high precision cut, making the entire process - from measuring to cutting - efficient and productive. Using encoders, the position of each primal on the moving belt is known at a resolution of 0,2 mm. A servo driven hold-down mechanism holds the product still during cutting, preventing any movement on the belt. The high-speed servo cut then finalises the job.

### 1 ▶ Pre-trim

Raw material is pre-trimmed for steak portioning. At the trimming stations individual worker statistics are collected, including worker name, working time, quality, utilization and product types.

### 2 ▶ In-weighing

Exact weight of steak-ready primals is recorded and sent directly to the IPM machine for optimal portioning. The in-weigher is especially useful when dealing with variable density between individual primals, for instance because of different fat contain, injections or when processing meat of different origins.

### 3 ▶ Portioning

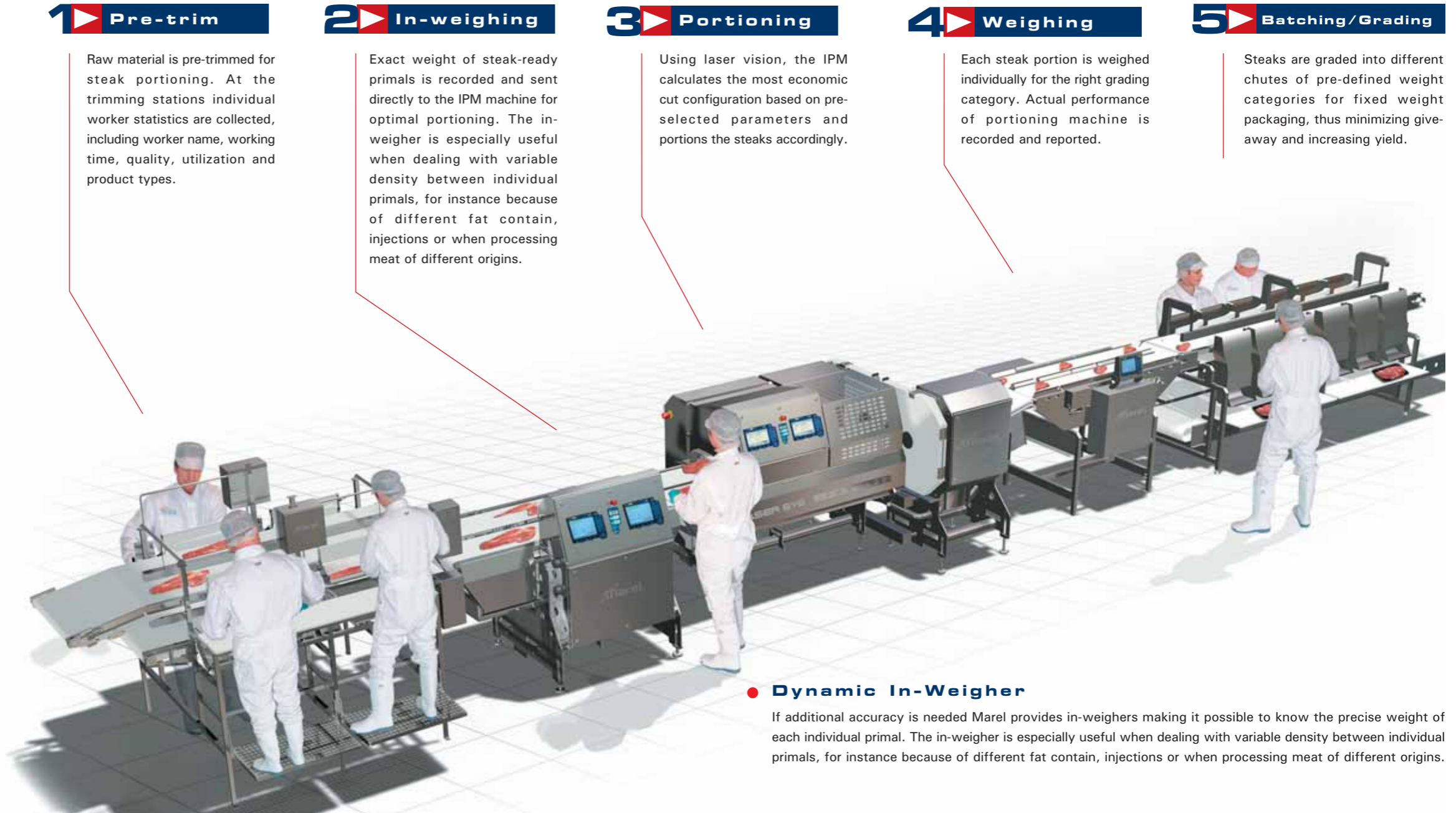
Using laser vision, the IPM calculates the most economic cut configuration based on pre-selected parameters and portions the steaks accordingly.

### 4 ▶ Weighing

Each steak portion is weighed individually for the right grading category. Actual performance of portioning machine is recorded and reported.

### 5 ▶ Batching/Grading

Steaks are graded into different chutes of pre-defined weight categories for fixed weight packaging, thus minimizing give-away and increasing yield.



#### ● Dynamic In-Weigher

If additional accuracy is needed Marel provides in-weighers making it possible to know the precise weight of each individual primal. The in-weigher is especially useful when dealing with variable density between individual primals, for instance because of different fat contain, injections or when processing meat of different origins.



### IPM III LaserEye X300

Capable of performing the work of 4-5 workers, the Marel IPM III LaserEye X300 is a single-lane unit operating at a cutting speed of up to 8 cuts per second, and is designed to meet the needs of small to medium-sized operations.

Single-lane



### IPM III LaserEye X600

Designed to meet the needs of larger operators, the Marel IPM III LaserEye X600 is a dual-lane unit operating at a cutting speed of up to 8 cuts per second on each of its twin blades and capable of performing the work of up to 8-10 workers.

Dual-lane



**NEW**

### IPM III LaserEye X400

Designed to portion large primals of meat the X400 is capable of performing the job of 4-5 workers at a capacity of up to 5 cuts per second. The machine has proven to increase yield significantly compared to non-intelligent slicers. In case of rump processing a system of X400 in line with X300 or X600 can increase tray pack yield and give-away significantly.

Single-lane



## Productivity

Operated at its rated capacity, the Marel IPM III LaserEye dual-lane machine can perform the work of up to 8-10 people. Robust and highly reliable, the IPM III LaserEye requires significantly less maintenance than conventional machines. Easily adaptable to new products, it cuts to a level of accuracy and consistency no human could ever hope to achieve, meaning higher yields, less trim, improved product quality, increased throughput, and a short payback time.

## Cut Variety

	Product	Portion size	Throughput*	Accuracy*
<b>Pork cut</b>	 Pork loin	85 - 150 g 3 - 5 oz 150 g and larger 5 oz and larger	750 - 1200 kg/hour 1700 - 2700 lb/hour 1200 - 1500 kg/hour 2700 - 3300 lb/hour	3 - 6 g 2,5 - 3,5%
	 Pork neck	100 - 150 g 3.5 - 5 oz 150 g and larger 5oz and larger	700 - 1000 kg/hour 1600 - 2200 lb/hour 1000 - 1400 kg/hour 2200 - 3000 lb/hour	4 - 6 g 3,5 - 4,5%
	 Pork shoulder	100 - 150 g 3.5 - 5oz 150 g and larger 5 oz and larger	700 - 1000 kg/hour 1600 - 2200 lb/hour 1000 - 1400 kg/hour 2200 - 3000 lb/hour	4 - 6 g 3,5 - 4,5%
	 Pork belly deboned	15 mm ½ in	800 - 1200 kg/hour 1800 - 2700 lb/hour	NA
	 Smoked bacon	35 - 50 mm 1½ - 2 in	800 - 1400 kg/hour 1800 - 3000 lb/hour	NA
	<b>Beef and veal cut</b>	 Strip loin	150 - 250 g 5 - 9 oz 250 g and larger 9 oz and larger	800 - 1200 kg/hour 1800 - 2700 lb/hour 1200 - 1500 kg/hour 2700 - 3300 lb/hour
 Ribeye		150 - 250 g 5 - 9 oz 250 g and larger 9 oz and larger	800 - 1200 kg/hour 1800 - 2700 lb/hour 1200 - 1500 kg/hour 2700 - 3300 lb/hour	7 - 9 g 2,5 - 4,5%
 Tenderloin (filet)		150 - 250 g 5 - 9 oz 250 g and larger 9 oz and larger	800 - 1200 kg/hour 1800 - 2700 lb/hour 1200-1500 kg/hour 2700 - 3300 lb/hour	4,5 - 6,5 g 2,0 - 3,5%
 Top butt		200 - 300 g 7 - 10 oz 300 g and larger 10 oz and larger	900 - 1400 kg/hour 2000 - 3000 lb/hour 1400 - 1600 kg/hour 3000 - 3500 lb/hour	5,5g - 6,5 g 2,0 - 4,5%

\* per lane

\* +/- 1 StDev

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INTELLIGENT PORTIONING SOLUTIONS

# MPS Portioning Software

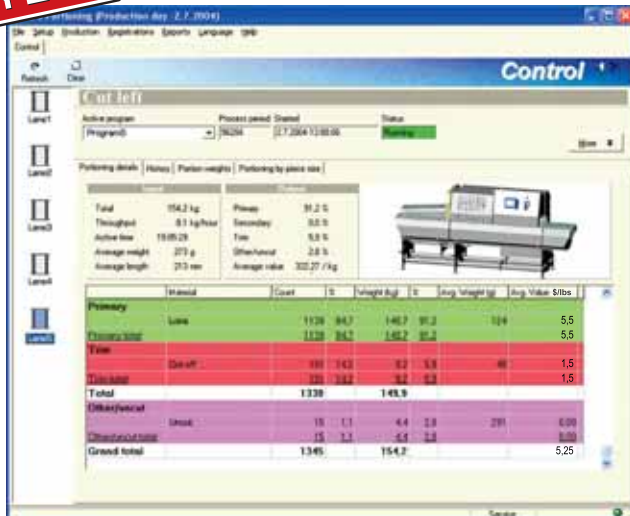


## MPS Portioning

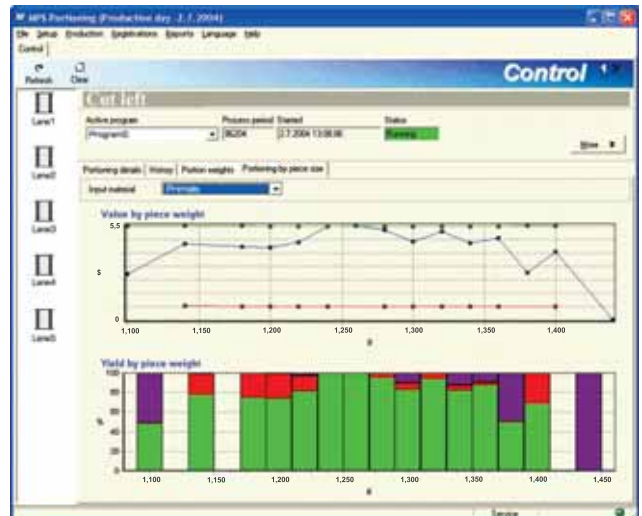
MPS Portioning is designed to configure and control portioning machines and to collect portioning data. The software can work with any number of machines and stores summarized long-term information about the weight, length and type of pieces and portions

The MPS portioning uses vision based data to calculate performance in portioning. The software provides time based production data as well as data broken down to individual portions or certain size group of primals. The software calculates key indicators of performance such as throughput, portioning yield, production value and other variables. Production managers can utilize the data to optimise the production process and therefore get as much value out of the machinery as possible.

**NEW**



Portioning details for selected key indicators



Information on yield and value by size of primals

## Payback

Marel develops high-tech processing equipment designed to increase the productivity of its customers. The Marel IPM III LaserEye is a good example of equipment with high profitability and a short payback period.

## Payback case study

### Before

A plant processing 30,000 lbs (14 tons) of boxed meat into steaks recently changed its processing layout. With the old plant layout, pre-trimming was done without any online yield measurements. Portioning was partly done by hand, and partly by older generation portioning machines. After portioning, the steaks were quality inspected but not graded.

### After

The new layout has a pre-trimming line with online information on all aspects of individual performance. A dynamic inweighing unit optimises accuracy and the new IPM III LaserEye portioning machine incorporates the latest in 3D laser vision and optimising software to perform with outstanding precision. After portioning, the layout contains an intelligent steak grader for minimized give-away.

**In the following study, the sales price of steaks is \$ 5.50 per lb and the value of cut-off in portioning is \$ 1.50 per lb. The plant operates 220 days per year.**

*The following calculation was done to compare the two processes:*



### ► Pre-trimming line

- Pre-trimming yield in the old system was 85%
- The new pre-trimming line improved the yield by 1.5 percentage points
- The yield on the new pre-trimming line is 86.5%

Increase in daily profit in the pre-trimming process:	\$ 1,800 per day
Increase in annual profit in the pre-trimming process:	\$ 396,000 per year

### ► Portioning process

- The primary product ratio in the old portioning process was 93%
- The in-weigher increased the yield by 1 percentage point
- The new IPM III portioner increased the yield by 2 percentage points
- The primary product ratio in the new portioning process is 96%

Increase in daily profit in the portioning process:	\$ 3,100 per day
Increase in annual profit in the portioning process:	\$ 682,000 per year

### ► Intelligent packing steak grader

- The give-away in the old system was 3%
- The new steak grader and more accurate portioning reduced give-away by 2 percentage points
- The give-away in the new process is 1%

Increase in daily profit in the grading and packing process:	\$ 1,950 per day
Increase in annual profit in the grading and packing process:	\$ 429,000 per year

### Total

► Increase in daily profit:	\$ 6,850 per day
Increase in annual profit:	\$ 1,507,000 per year

**The payback period of the system is less than a year.**