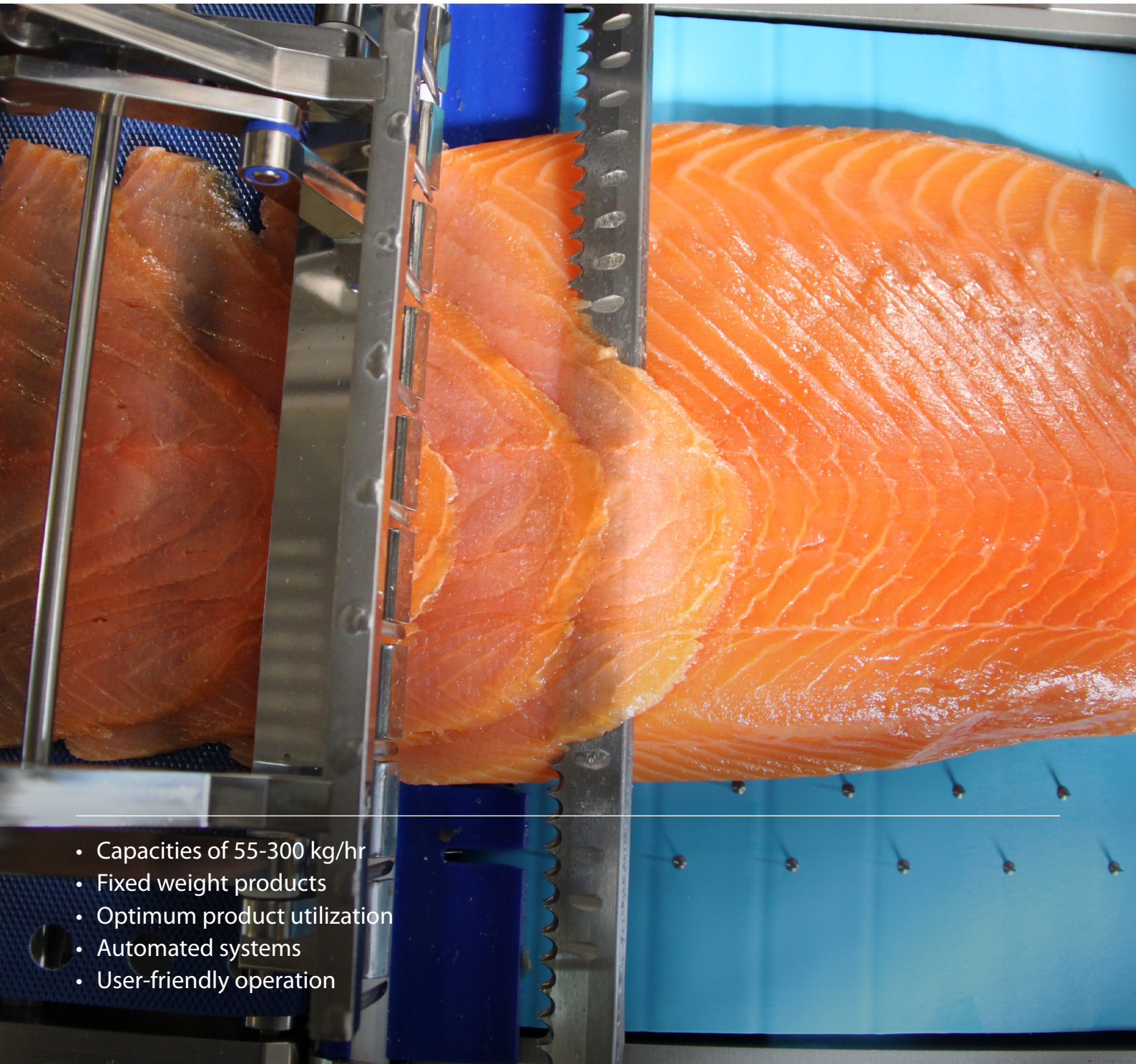


Equipment, systems, and software for the salmon industry

Salmon slicing



- Capacities of 55-300 kg/hr
- Fixed weight products
- Optimum product utilization
- Automated systems
- User-friendly operation



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The range and technology of Marel salmon slicing equipment is second to none. Marel have been operating successfully throughout the world for three decades. During this time, our slicers have undergone constant development to meet our customers' increasing demands for better quality, yield, and capacity, and we have moved from basic electric and pneumatic machines to advanced models with servo drives, computers, touchscreens, weighing units, and vision systems.

All Marel slicing equipment meets modern salmon processing facility requirements in terms of reliability, safety, ergonomics, maintenance, hygiene, and cleaning. Key features and benefits of our slicing range include:

- High capacity
- High yield – with yield monitoring software
- Wide cutting range interval
- Flexibility – with many product options
- Quality end products – with superb presentation
- Easy to operate & easy to clean
- Foreign language support
- Remote support

Our exceptional variety of fresh slicing equipment is designed to match all requirements, high or low capacity, ranging from standard single units to large-scale production systems.

Furthermore, our salmon slicers can slice other fish such as trout, halibut, and tuna, that share a similar structure.

Let us put our expertise to work for you

Marel slicing equipment is designed to give you the best results, but we also recognize that slicing quality, yield, and efficiency can be greatly affected by other processes such as filleting and skinning, as well as storage and refrigeration. Our salmon slicing experts are happy to sit down and discuss your specific needs; to find the most suitable slicer for your purposes, and to ensure you will get the most out of your equipment.



Silk Cut slicers

Third generation



Marel Silk Cut slicers are the most successful electric salmon slicers on the market. The slicers are available in three configurations:

MSC 50

A compact, single-lane machine based on the same slicing and cleaning principles as the larger machines, and with the same corresponding benefits. Its slicing capacity is 50 slices/min, or around 50 kg/hr. Slice thickness and slicing angles are set manually and are infinitely variable. The MSC 50 is our entrance level machine for small businesses with limited slicing.

MSC 90

A single-lane machine with a capacity of up to 90 slices/min, or around 100 kg/hr. The MSC 90 is the ideal choice for a small business that needs extra slicing capacity.

MSC 180

A dual-lane machine with a slicing capacity of up to 200 kg/hr for maximum throughput. The MSC 90 and MSC 180 are equipped with a user interface that makes operation very safe and easy for employees at all levels. All operations are accessed by a color touchscreen, including multiple language selection. The unique design of the cutting table and the infeed/outfeed conveyors ensure a very high slicing quality.

Optional software app

Additional software can be installed in the MSC 90 and MSC 180 for advanced variable slicing. The app enables you to make and store slicing programs where the fillet is divided into three sections. The app can be retrofitted and includes a fish sensor setup.

Cutting options

The slicing angle is 8°-20° on the D-cut models. The slice thickness can be varied from 2-10 mm on the MSC 50 and from 2-20 mm on the MSC 90 and MSC 180. The maximum cutting width is 205 mm on all three models.

Features

- Capacity up to 200 kg/hr
- Easy-to-clean design
- Safe & easy operation
- Gentle handling of fillets
- Software app for advanced variable slicing
- Online support



Wide slicing angle Range 8° to 70°



Multi angle

Marel Silk Cut slicers are available in a multi-angle edition as a single-lane MSC 90 MA with up to 90 cuts/min, or a dual-lane MSC 180 MA with up to 180 cuts/min. They are designed using high quality components to ensure easy operation, optimum slicing, and fast and efficient cleaning.

Maximum flexibility

The multi-angle machines are the most versatile slicers on the market with a slice angle interval of 8°-70° and can be used for:

- Standard D-cut slicing
- Bacon cut slicing
- Sushi product slicing
- Portion cutting of hot smoked, cold smoked & raw fish

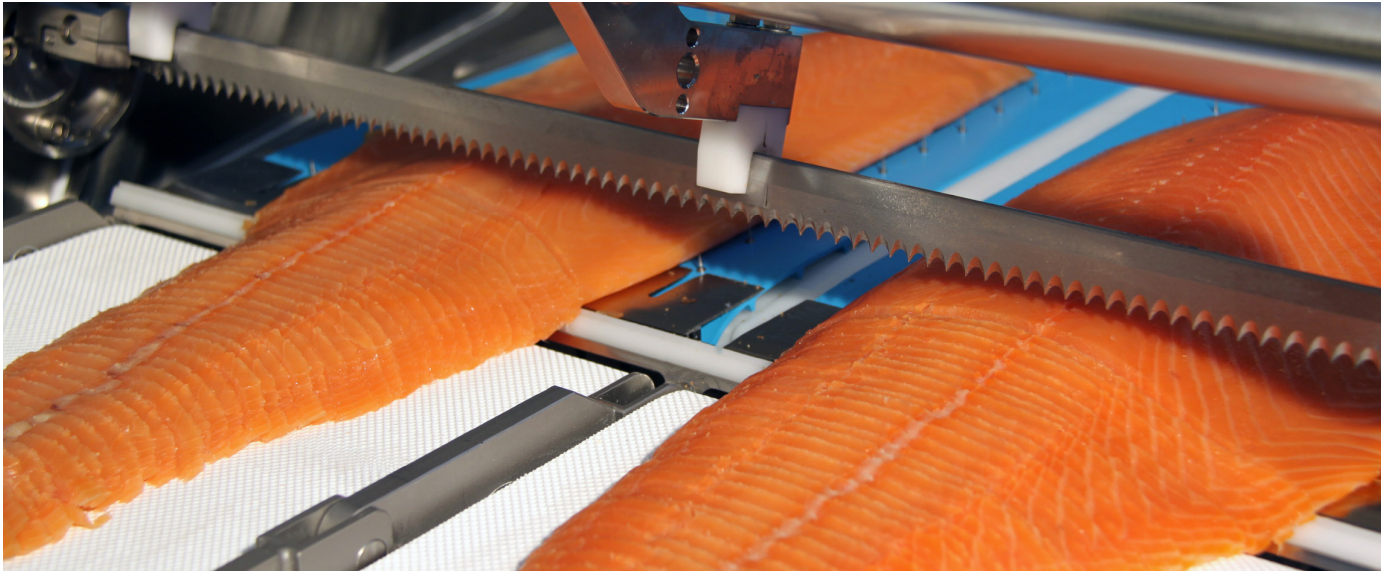
Thickness is adjustable from 2-250 mm, making the slicers suitable for most applications in existing productions.

The produced weight will depend on fillet size and slice/portion weight.



Features

- Capacity of 90 or 180 cuts/min
- Wide slicing angle interval 8°-70°
- Easy-to-clean design
- Safe & easy operation
- Gentle handling of fillets
- Software app for advanced variable slicing
- Online support



High-speed slicers SC 250 series

The SC 250 high-speed slicer is the fastest on the market for fresh salmon slicing.

This slicer performs with an impressive capacity of up to 250 slices/min, or about 300 kg/hr. This exceptionally high throughput is achieved without compromising the slice quality, making it an ideal solution for high-volume slicing.

User-friendly operation

The SC 250 user interface has set new standards for user-friendliness and employee safety. The operator uses a color touchscreen to enter different slicing programs for angle intervals and slice thickness. When a command is selected, an explanation on the screen tells the operator exactly which operation will be carried out. The operator only sees the information needed for operating the machine, which makes it easy to understand.

Unique cutting concept

The SC 250 slicer's synchronized cutting action ensures the slicing angle and cutting edge are always perfectly aligned. Fillet profiles are measured at the infeed conveyor so that the slicing program and knife movement can both be optimized. A pre-weighing scale can be added as a valuable optional equipment to register the weight of the fillets, for exact yield calculation and monitoring of the raw material being processed. Furthermore the pre-weighing scale offers a buffer function making it easier for the operator to line up the filets correctly and maintain full capacity.

Standard or multi angle

There are two editions of the SC 250: one with a cutting angle interval of 8-45°, providing greater flexibility than any standard slicing machine; and the other a multi-angle version with a cutting angle interval of 10°-68°, enabling the production of many different end products such as standard D-cut slices, sushi slices,



sashimi cut, bacon cut, and raw or hot smoked salmon portions or escalopes.

Improved product yield

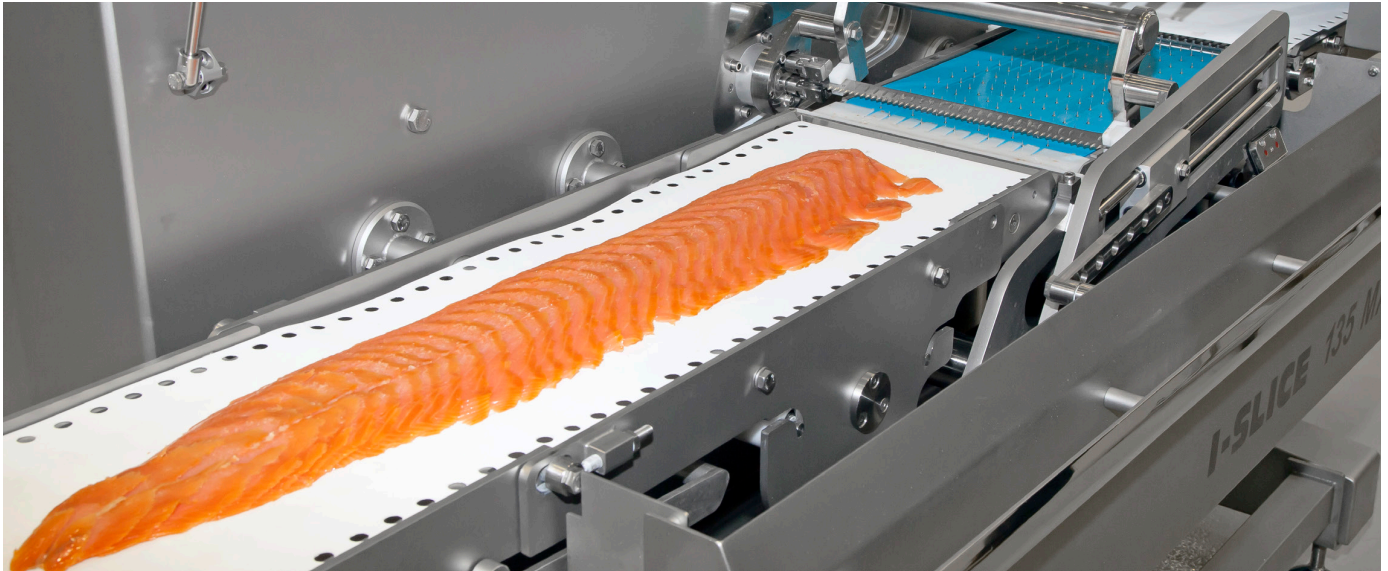
Using the easy set-up procedures for programming slicing profiles improves yield by ensuring there are more usable slices. Slice thickness and slicing angle can both be varied throughout the fillet, normally resulting in 10-20% higher yield. This also minimizes any problems with small slices at the tail and head of the fillet.



The user interface is easy to operate

Features

- High capacity of up to 250 slices/min
- High-quality slices or portions
- Several software apps
- User-friendly touchscreen
- Easy-to-clean design
- Two-way line control
- Flexible cutting: 8°-45° or 10°-68°
- Online support



Fixed-weight slicers

I-Slice 135

The I-Slice 135 makes fixed-weight slices or portions, and features outstanding accuracy and stability.

Measuring for the best cutting profile

At the infeed, the fillet is weighed and then its volume is measured using a camera with the latest vision technology. This data is used to determine a cutting profile that meets the specifications of the final product and ensures maximum utilization of the raw material. The result is high-quality products within the target weight.

The cutting table's specially designed cutting belts keep the product stable to ensure precise cutting. For extra support, a product holder fixes the end of the fillet on the spike belt to keep it stable during the final cuts.

Great software features

The I-Slice is easy and safe to use, and all settings are easy to control using the multilingual color touchscreen. Programs for specific product types can be stored, making it fast and easy to switch from one product to another.

The software package enables the machine to create space between each slice/portion, making it easier to handle slices when building boards of e.g. 100 g. It is also possible to run the machine with automatic product length, to ensure end products with uniform length.

Maximum flexibility

The increased height of the I-Slice 135 product inlet facilitates cutting of special products. There are two versions of the slicer: a standard slicer with a slicing angle interval of 8°-45°; and a multi-angle edition with a slicing range of 8°-68°.



Marel can offer a complete system with one, two, or more slicing units, packing stations, and check weighing set-ups, customized to meeting your exact requirements.



For extra support, a product holder fixes the end of the fillet on the spike belt to keep it stable during the final cuts.

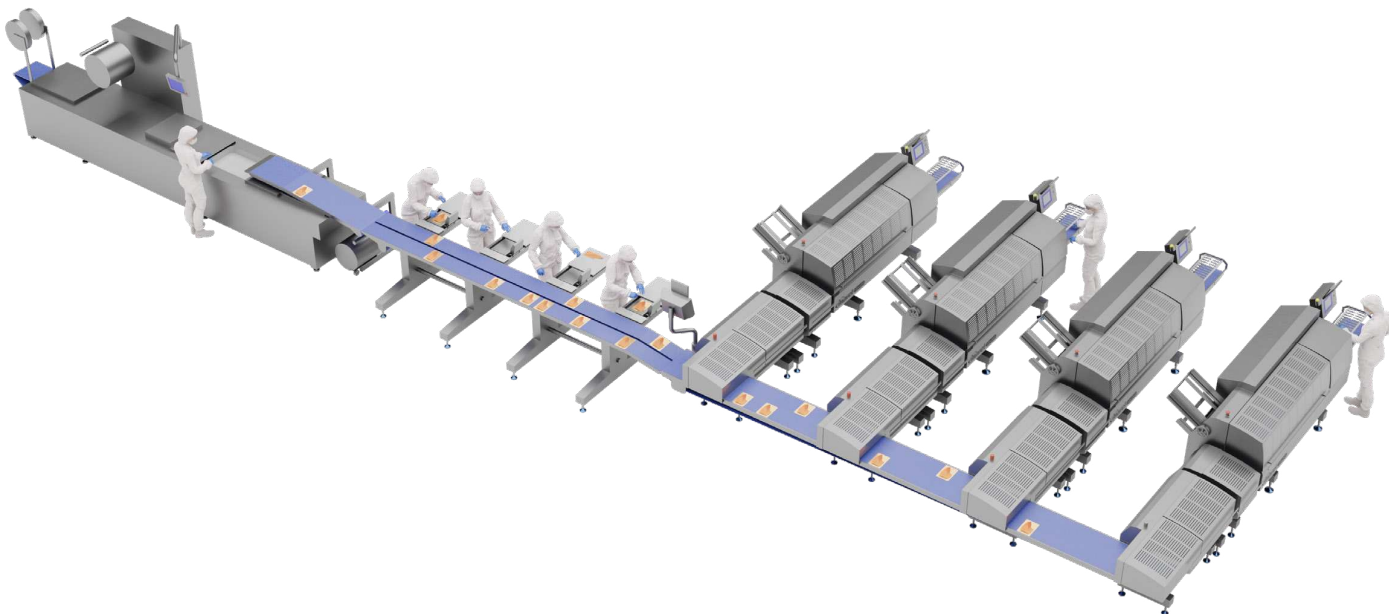
Features

- Fixed weight slices
- Minimum handling
- Maximum stability product holder
- Extreme accuracy with vision camera
- Flexible cutting: 8°-45° or 8°-68°
- High product infeed for special products
- Easy & safe to operate by touchscreen
- Spacing between products
- Two-way line control
- Online support

Retail Pack systems



Slicing line with 1 Retail Pack Slicer for manual bagging.

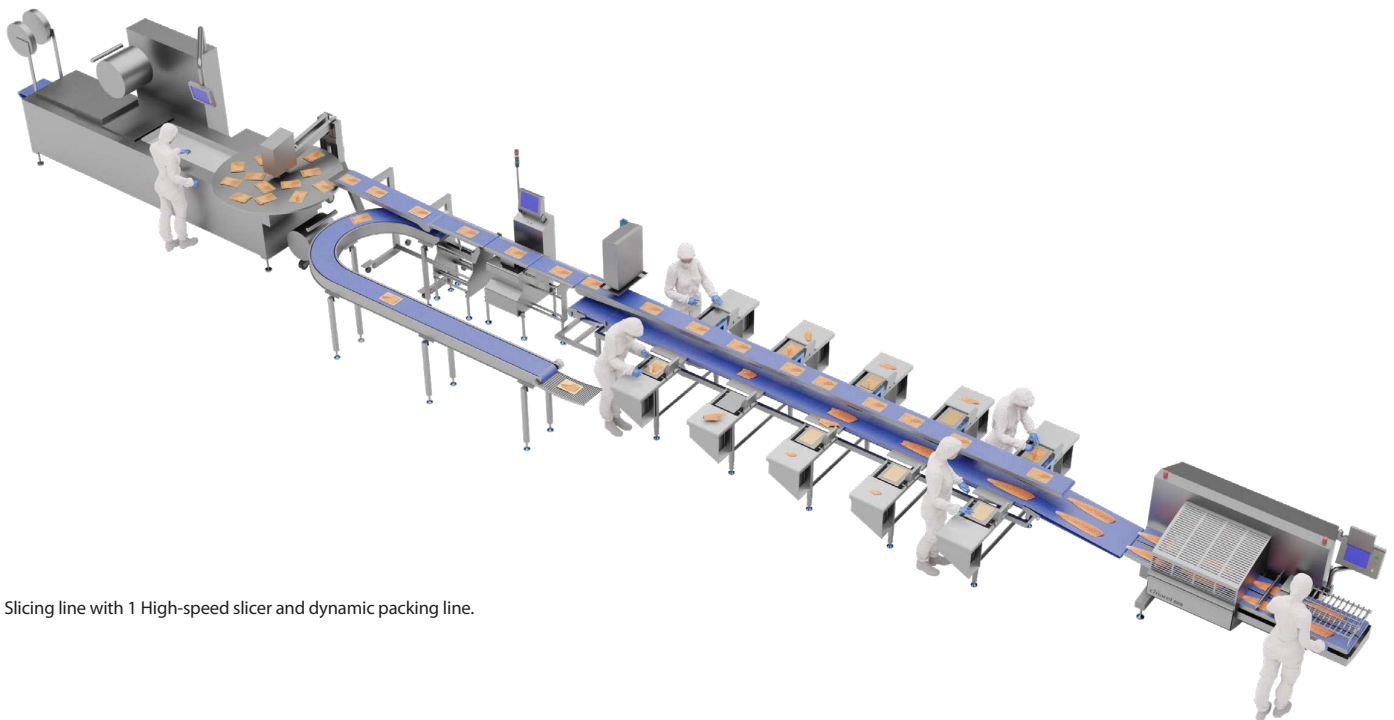


Slicing line with 4 Retail Pack Slicers with packing line for thermoforming.

Marel has extensive experience in designing slicing line systems adapted to fit your individual needs and facilities. We offer integrated systems with slicing units, along with packing stations and checkweighing equipment. Our consultants are ready to assist with advice and guidance to find the best solution for your factory.

For the Retail Pack Slicer we have solutions with automatic checkweighing of each batch before distribution to the packing area. Batches that need re-working are automatically separated for manual handling, while batches within the target weight proceed to the packing machine at the end of the line. We offer solutions with 2-4 height-adjustable workstations with integrated packing scales.

Dynamic packing lines



Slicing line with 1 High-speed slicer and dynamic packing line.



Slicing line with 1 single-lane slicer and a packing line for 4 operators.

The DPL concept is based on Dynamic Packing Lines, where operators pick the sliced salmon directly from the moving feed belt and build the packs on the scales, fully integrated with the slicers and designed for producing retail packs. The speed sync system ensures the speed of the line infeed conveyor matches the slicer outfeed speed and optimizes the

slice spacing feature. Slices are spread out on the line to make it easy and quick for operators to count and grab the slices in bundles fitting the packing format. To achieve the most ergonomic work position, operators are placed next to the feed belt at height-adjustable workstations with integrated packing scales.



Retail pack slicer

I-Slice 3400

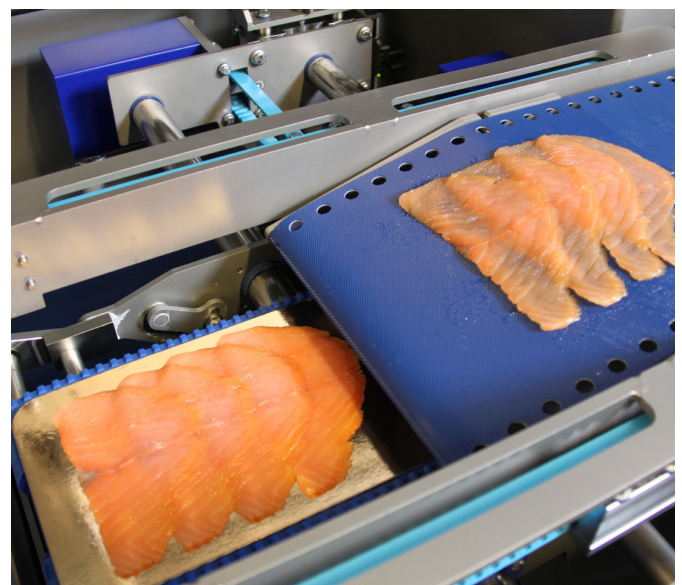
The I-Slice 3400 enables efficient and flexible production of salmon retail packs with automated delivery of batches of sliced salmon down to 50 g ready for packing.

The slicer both scans and pre-weighs the fillets to produce packs (batches) of slices with optimal utilization, reducing waste to a minimum and a very high level of accuracy.

The slicer can produce fixed weight packs with fixed numbers of slices e.g. 4 x 25 g, or fixed weight packs with a variable number of slices. The slices in each batch are perfectly aligned for exceptional pack presentation. It comes with a standard cutting angle interval of 8°-40° and an upgraded edition for maximum flexibility with a range of 8°-70° enabling cutting of portions and short slices.

The slicer is easy and safe to operate, with all settings easily made via the multilingual color touch screen. The process is entirely automated, resulting in the utmost efficiency and superior product presentation on a board, tray, or conveyor for skin packing.

Marel can offer a complete system with up to 4 slicing units, checkweighing, and customized to your needs.



Features

- Fixed weight or fixed count of slices
- Automatic sorting of head & tail pieces
- Batch delivery; on boards, trays, or directly onto belt
- Very accurate product placement
- Minimum handling of slices
- Flexible cutting 8°-40°. Upgraded edition 8°-72°
- Easy and safe to operate
- Online support



Horizontal slicers

A horizontal slicing machine is perfect for making long slices of fresh, cold smoked salmon and similar fish species.

The machine produces long slices that are ideal for customers in the food service industry; making value-added products like canapes, creating new dishes for menus, or creating retail packs with a different appearance.

The two models available for horizontal slicing – the MSC 650-45 and MSC 240 – basically make the same end product, but differ in terms of operation, features, capacity, and investment.

The MSC 650-45 features automatic infeed and tail clamping and can slice up to 120 kg/hr (for 1 kg fillets with a slice thickness of 2.4 mm), while the MSC 240 is loaded manually and can produce 60 kg/hr.

The slicing process

The operator feeds the machine with fillets (skin on) and the tail is clamped. The fillet is sliced horizontally from the top and down to the skin. After slicing, the fillet is ready for vacuum- packing or further handling.

For best slicing results, we recommend the fillet be between -2° and $+4^{\circ}$ C, depending on texture.



Features

- High-quality slicing
- Automatic in-feed and out-feed on MSC 650-45
- Minimum waste
- User-friendly operation
- Easy-to-clean design
- Online support



Sushi slicing: 68° – short slices



D-cut slicing: 18° – standard slices



D-cut slicing: 10° – longer slices

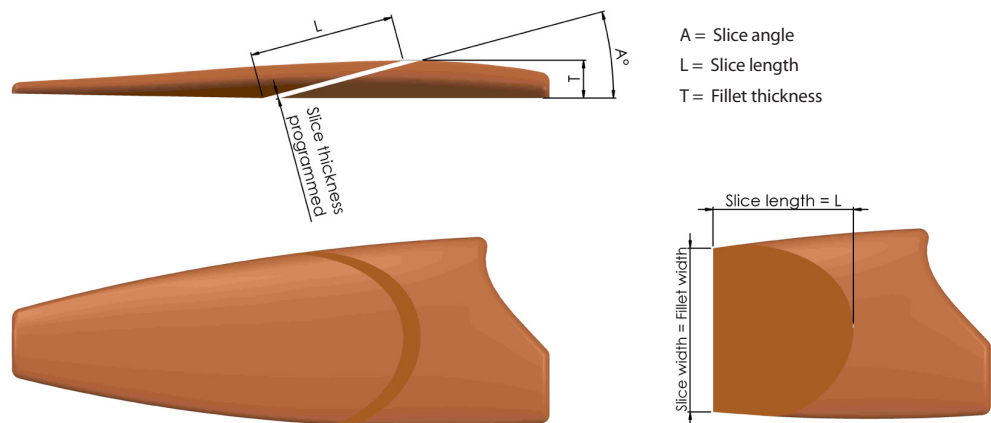
Slice angle & thickness

The slice angle and thickness are key factors when producing slices or portions of salmon. The settings of the machine decide how the end-product will turn out. Marel salmon slicers operate in various angle intervals and the slice thickness can be defined to meet your end-product specifications to achieve

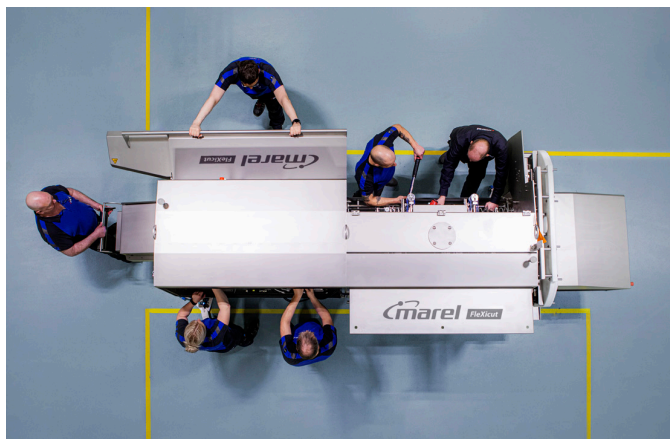
the best quality, while also ensuring optimum yield. For most of our machines, software is available that enables you to store programs with different settings and easily change your production from one product to another.

SLICE LENGTH TABLE															
Fillet thickness	Slicing angle														
	8°	10°	13°	20°	25°	28°	30°	40°	45°	60°	66°	68°	70°	72°	
50 mm	n/a	n/a	222	146	118	107	100	78	71	58	55	54	53	53	
45 mm	n/a	n/a	200	132	106	96	90	70	64	52	49	49	48	47	
40 mm	n/a	230	178	117	95	85	80	62	57	46	44	43	43	42	
35 mm	n/a	202	156	102	83	75	70	54	49	40	38	38	37	37	
30 mm	216	173	133	88	71	64	60	47	42	35	33	32	32	32	
25 mm	180	144	111	73	59	53	50	39	35	29	27	27	27	26	
20 mm	144	115	89	58	47	43	40	31	28	23	22	22	21	21	
15 mm	108	86	67	44	35	32	30	23	21	17	16	16	16	16	
10 mm	72	58	44	29	24	21	20	16	14	12	11	11	11	11	

Slice lengths in mm, calculation based on fillet thickness and slicing angle.



Slice thickness is measured at the bottom of the slice.



Service and support

The Marel service organization operates under the principle of a global reach with a local focus. With offices and subsidiaries in some 30 countries and a network of more than 100 agents and distributors, Marel is in a unique position to serve its customers wherever they may be located. Regional teams take the company closer to its customers, facilitating faster on-site response times while the international online support team offers remote technical support directly to the site or even the equipment where possible.

Maintain maximum uptime

Customers can have peace of mind with Marel's wide range of customizable service solutions depending on the priorities and preferences of any given operation. Marel's service solutions are tailor-made into a unique and robust service agreement that can easily be adapted as operations change or grow. The comprehensive preventive maintenance program offers a structured way to reduce the risk of unexpected breakdowns and help maintain maximum performance. As a result, maintenance costs become more predictable and routine tune-ups are scheduled to fit into the production cycle, minimizing downtime and extending equipment lifetime.

Spare parts services

Marel offers flexible spare parts packages tailored to different needs. Customers can choose to maintain a full range of common use replacements tailored to on-site equipment, keep spare parts kits for planned maintenance of individual items, or get individual parts as and when required. All Marel's parts are manufactured from high-quality materials and provide optimal performance for the equipment. For more information, see: marel.com/en/service/spare-parts

Improve your output with proactive services.



Monitor & optimize

The slicing process with Innova

Total overview & reporting

It is vital for salmon processors to track operational performance and optimize the production flow of their slicing process. Innova provides reliable data collection for statistical analysis and real-time monitoring of key performance indicators. These valuable insights enable salmon processors to monitor and optimize the performance of every slicer and the efficiency of the whole production line.

Key features

- Data collection:
 - Registration of fillets – pieces, total & average weight from pre-weighing scales on the slicers
 - Registration of all data from checkweighers
 - Yield – primary product, trim & waste
 - Giveaway – product, pieces, total & average weight
 - Registration of individual work station performance
- Detailed production reporting with static reports
- Production optimization reports
- Real-time monitoring via live dashboards
- Device status alarms & notifications
- Traceability by logging historical data
- Easy, central control of the whole line
- Overall Equipment Effectiveness (OEE) module available as an add-on

Key benefits

- Gain a complete overview of KPIs
- Use reports to undertake historical analysis of performance results
- Monitor in real time to intervene immediately in the event of performance deviation

Product specification

	MSC 50	MSC 90	MSC 90 MA	MSC 180	MSC 180 MA
Number of Lanes	1	1	1	2	2
Capacity – max slices/min *	50	90	90	180	180
Capacity – kg/hr at 1.2 kg fillets **	50	100	100	200	200
Cutting Angle Interval	8-20°	8-20°	8-70°	8-20°	8-70°
Slice Thickness mm	2-10	2-20	2-600	2-20	2-600
Max Slice Length mm**	200	200	200	200	200
Max Product Height mm	40	45	45	45	45
Max Product Length mm	700	700	700	700	700
Max Cutting Width mm	205	205	205	2x205	2x205
Fixed Weight Products					
Type of slicing	D-Cut	D-Cut	D-Cut Multi Angle	D-Cut	D-Cut Multi Angle
Recommended Temperature Interval	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)
Site Manager System		•	•	•	•
Packing Line Systems Available		•	•	•	•
Electricity – Standard	1x230V +N+PE 50HZ 3x220V+PE 60HZ	3x400V +N+PE 50HZ 3x220V+PE 60HZ	3x400V +N+PE 50HZ 3x220V+PE 60HZ	3x400V +N+PE 50HZ 3x220V+PE 60HZ	3x400V +N+PE 50HZ 3x220V+PE 60HZ
Electricity – Optional		3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ
Power Consumption kW	0.9	1.6	1.6	1.6	1.6
Compressed Air					
Dimensions mm (L x W x H)	2090x780x1530	2090x780x1530	2090x780x1440	2090x1030x1540	2090x1030x1440
Weight kg	270	270	305	295	330
Software Packages Available***					
Variable Slicing	n/a	Optional	n/a	Optional	n/a
Variable Slicing & Portion Length Control	n/a	n/a	Optional	n/a	Optional
Spacing of Slices & Portions	n/a	n/a	n/a	n/a	n/a
Portion Length Control	n/a	n/a	n/a	n/a	n/a
Slice Length Control	n/a	n/a	n/a	n/a	n/a
Batching	n/a	n/a	n/a	n/a	n/a
Innova Standard Solution	n/a	n/a	n/a	n/a	n/a

SC 250	SC 250 MA	I-Slice 135	I-Slice 135 MA	I-Slice 3400	MSC 240	MSC 650-45
2	2	1	1	1	1	1
250	250	125	125			
300	300	130 f. w. slices	130 f. w. slices	90	60	120
8-45°	10-68°	8-45°	8-68°	8-40° / 8-72° ^{***}	0	0
2-99	2-600	2-300	2-300	2-20	1.8-5	Std. 1.8 - 10, (Adv. 1.8 - 45)
250	250	250	250	250	600	650
50	50	80	80	50	48	45
750	750	750	750	750	600	650
2x220	2x220	250	250	250	240	230
		•	•	•		
D-Cut	D-Cut Multi Angle	D-Cut	D-Cut Multi Angle	D-Cut Multi Angle only retail packs	Horizontal	Horizontal
0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)	0° (+ - 4 °C)
•	•	•	•	•		•
•	•	•	•	•		•
3x400V +N+PE 50HZ 3x208-240V+PE 60HZ	3x400V +N+PE 3x208-240V+PE 60HZ	3x400V +N+PE 50HZ 3X220V+PE 60HZ	3x400V +N+PE 50HZ 3X220V+PE 60HZ	3x400V +N+PE 50HZ 3X220V+PE 60HZ	1x230V +N+PE 50HZ 3X220V+PE 60HZ	3x400V +N+PE 50HZ 3X220V+PE 60HZ
3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ	3x380V+N+PE 3x320V +PE 50HZ	3x380V+N+PE 3x230V +PE 50HZ		3x380V+N+PE 3x230V +PE 50HZ
1.7	1.7	1.8	1.8	3.1 Incl. MSP +0.2 Incl. outfeed conv. +0.15	0.9	1.3
		10 l/min., 8 bar	10 l/min., 8 bar	50 l/min., 8 bar	400 l/min., 8 bar	
2950x1180x1500	2950x1180x1500	3650x1000x1610	3650x1000x1610	3330x1380x1610	1570x770x1230	2680x880x1230
750	750	775	775	1050	250	340
Standard	Standard	Standard	Standard	Standard	n/a	Optional
n/a	n/a	n/a	n/a	n/a	n/a	n/a
Standard	Standard	Standard	Standard	Standard ****	n/a	n/a
Standard	Standard	n/a	n/a	n/a	n/a	n/a
Standard	Standard	Standard	Standard	n/a	n/a	n/a
n/a	n/a	n/a	n/a	Standard	n/a	n/a
Optional	Optional	Optional	Optional	Optional	n/a	n/a

* Depends on slice angle and fillet thickness. Fish quality, texture, and tempering can also be limiting factors

** Conversion of slices/min to kg depends on fillet size, slice angle, and slice thickness (= slice weight)

*** All software packages – standard and optional – can save and store programs

**** Up to 60°

TRANSFORMING FOOD PROCESSING

