Breast filleting meets intelligence

Stork AMF-i

- **Top fillet quality and optimum fillet yield**
- **Intelligent breast cap measuring**
- **Automatic adjustment of module settings**
- **Easy menu control**

Embedded intelligence enables adaptive breast cap filleting

Markets around the world ask for the most efficient automated production of the highest quality breast fillets. Marel Poultry's modular breast filleting solution perfectly responds to this. Stork AMF, a worldwide success story, has constantly been improved since its origin in 1996. Now the latest AMF-i generation sets the ultimate milestone in breast cap filleting. This is the first intelligent breast filleting system using automatic adaptation to breast cap input to combine highest yield, highest capacity and highest product quality.

The AMF-i breast cap filleting system will debone a wide range of breast cap weights into a large variety of skin-on or skinless breast fillet products. The high yield fillet products are perfectly suitable for retail sale or for further processes.
High quality, consistently high yields and low manning levels are hallmarks of the system, which is compact and easy to operate and maintain.

Hundreds of AMF systems are currently in operation worldwide, proving their success on a daily basis.

Consistent performance
Skinning and deboning is done in modules installed along a transport conveyor equipped with special product holders. Each module is responsible for a single process step. Breaking the total process into steps, which can be continuously monitored and controlled by the advanced interface, is the

secret behind the high fillet quality and consistently high fillet yields achievable with AMF-i.
Total system yield is lifted still further by careful harvesting of valuable by-products such as skin, breast tendon meat and breast cartilage.

Wide range of end products
Stork AMF-i will produce a large variety of end products from whole butterflies with tenderloins attached to half fillets with tenderloins harvested separately. End products can be either skinless or skin-on. Recipes can be entered on the touchscreen, located on the machine itself.

Adaptive intelligence
The system can handle a wide variety of breast caps, even from different chicken breeds, having specific proportions. That's because AMF-i automatically detects changing dimensions

The influence of incoming breast cap fluctuations will be eliminated.

of the incoming products. Module settings will be adjusted accordingly and adaptive filleting can be achieved without human intervention needed.

Operational flexibility

The system's modular set-up makes it suitable for all processors regardless of fillet volumes handled. Processors can start by mechanizing some process steps and maintaining the manual operations for other steps. As volumes expand or if labor becomes more expensive, modules can be added.
Quite simply, any processor who industrially fillets breast caps can benefit from using an AMF-i system.

Modular construction helps in other ways, too. Modules can be switched on or off in an Instant, allowing different end products to be made. This gives processors optimum flexibility, allowing them to react nimbly to changing orders from their customers.

Latest, highest standards

A well-known characteristic of Stork AMF breast cap filleting is its upgrade capability; every existing system can be updated to the latest generation. By taking the AMF system to the latest,

highest standards and added value, processors will have the important advantage of increasing return of investment with limited upgrades.

Low manning levels

Loading of breast caps can be done manually or semi-automatically, saving labor. Subsequently, all filleting operations are done automatically, with the exception of, final fillet and tenderloin harvesting as well as any necessary trimming work.

Fillet and tenderloin are harvested easily by hand after having been cut and loosened from adjacent bone and tendons in preceding automatic modules. This technique allows meat to be checked for residual bone at the same time, a people-efficient process which also helps ensure top product quality.

AMF-i

A wide variety of modules

AMF-i is made up of processing modules installed along a transport mechanism equipped with turning product holders. Thanks to individual breast cap measuring, modules are automatically adjusted to their most profitable settings.

System layout

The system has a compact footprint. Its length will depend on hourly throughput and the number of manual and automatic filleting, inspection and trimming operations to be carried out along it.

Breast caps are typically supplied to the system on a SystemFlex belt or walking beam conveyor. A trough runs underneath the mechanism to catch debris that comes from filleting. This is kept clean by a scraper which circulates with each revolution of the transport mechanism. A clean working environment supports the quality of process and product.

The product holder

The AMF product holder is a key component. Meat quality and yield will depend on breast caps being positioned and presented correctly for each step in the process.

The product holder can rotate through 360 degrees. A shaped positioning finger, fixing clamp and a ball centering device ensure that caps are held straight and secure at all times. A special product holder with no positioning finger is available for those processors wanting to produce a whole butterfly

with either membrane or membrane and white breast bone remaining on the harvested meat. Breast caps are loaded onto the holders and conveyed through each of the system's modules by the transport mechanism. Turning stations position the holder correctly for each processing operation.

Individual breast cap measuring

Up to now, processors had to grade breast caps into different weight categories and apply the right settings themselves to achieve the highest yield. The AMF-i measurement unit, located up front in the AMF-i line, classifies breast caps in a way to set modules automatically to product size and specification. The classification of the breast cap will be "connected" to the respective product carrier. Based on breast cap size qualification and end product requirements, the AMF-i modules automatically optimally adjust their respective settings. Therefore, the measurement unit in the AMF-i system will eliminate the influence of incoming breast cap fluctuations. In addition, AMF-i is compatible with Marel Innova food processing software. Analysis is possible with Innova IMPAQT (Intelligent Monitoring of Performance, Availability and Quality Trends), giving plant management the opportunity to continuously improve process effectiveness.

Processing modules

End products and the degree of mechanization required will determine the number and type of modules in a system.

Breast Cap Loader

A single operator slides breast caps to the module's loading units, which position them accurately on the product holders. The module halves the labor needed to load the system at full capacity. The single loading operator remaining now has an easier and less critical job to do.

Breast Skinner-i

This module removes breast skin in a single piece without damaging the underlying fillet. This skinner also removes more crop fat, thereby optimizing performance of the wishbone removing module.
A vertically mounted roller and metal shoe, grip and pull skin from the breast cap. Skin is discharged via a chute for collection in a container or in the receiving bin of a vacuum transport system.
A lever at the side of the module engages and disengages it, allowing the production of both skin-on and skinless breast fillet products.

Breast Blister Remover-i

The Breast Blister Remover-i is often necessary if the system is to produce a high-quality skinless whole fillet (butterfly). Blisters are removed by rotating rollers in the unit and discharged into the trough under the transport mechanism. A lever at the side of the module engages and disengages it, allowing it be switched out of line when not needed.

Wishbone Remover-i

Removing the wishbone from the product is all about reducing meat loss to a minimum with virtually no risk of bone residues in the fillet. The Wishbone Remover-i features a weight-dependent setting for the optimum processing of breast caps. Instead of setting the module to a single average weight, the cam controlled knife can be set to cut in two different ways. Depending on the product's size, the right settings are automatically regulated by PLC control. This reliable way of cutting out the wishbone results in increased fillet yield for smaller products which can be as much as 3 grams per wishbone.

Halving Module-i

The Halving Module-i uses two knives, which operate at a certain distance from each other to cut along the breast bone. But of course every breast bone is different. If the distance between the two knives is too wide, you get loss of yield; if the distance is too narrow, the bone will be cut, which can result in bone content in the meat. The Halving Module-i, however, performs a very accurate halving job, which automatically adjusts to different sizes of breast caps, by cutting as close as possible on both sides of the breast bone. Fillet meat yield will be maximized and will no longer depend on manual settings.
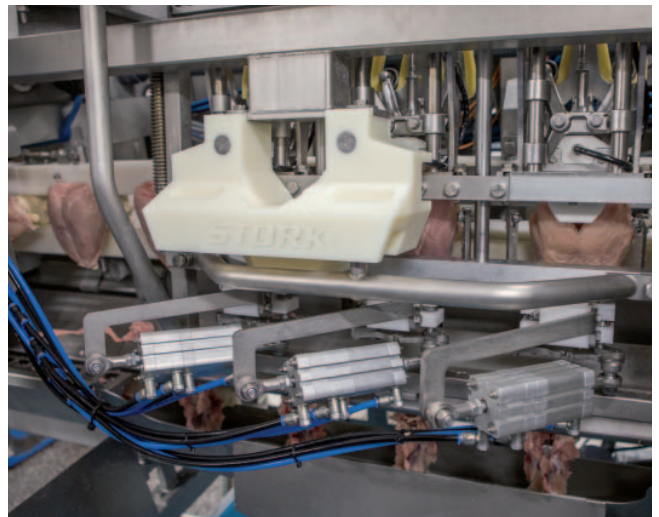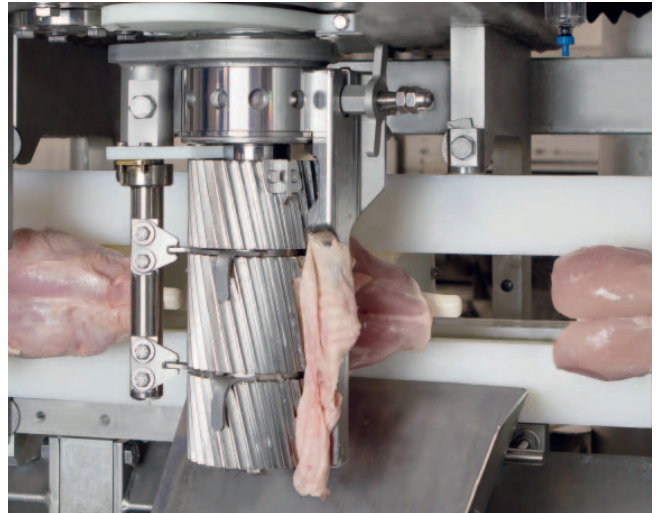
Fillet Separator-i

This Fillet Separator-i severs all connections between fillet, ribs and keel-bone allowing fillet – including the baby tender – to be harvested easily from the carcass by hand.
The module can be supplied with optional fat, eye meat and tendon separation units for trimming away abdominal fat and eye meat and for cutting through any tendon connections remaining between the fillet and the wing joints. The tendon separation unit is an invaluable aid when working with breast caps with inaccurately cut shoulder/wing joints.

A combination of blades and scrapers separates fillet from ribs and keel-bone. If abdominal fat and eye meat are to be trimmed away, this is done by blades which make all necessary incisions. Fat and eye meat will then remain on the carcass when the fillet is harvested.
If the tendon separation unit is specified, tendon pullers sever any remaining unwanted connection between fillet and shoulder/wing joint.
If the module is installed complete with optional fat, eye meat and tendon separation units, a control panel at the module itself allows these to be switched on and off as required.

Tendon Trimmer

This module and the tenderloin separating module which follows will be needed if tenderloins are to be harvested separately. Both are installed downstream of operators harvesting the main fillet and can be disengaged when fillet with tenderloin attached is being produced.
Meeting ever more specific end product requirements, the

Tendon Trimmer has a quick manual height adjustment for the rotating blades, which cut off the tendons of the tenderloin. This makes the module easier to adjust to the product range being processed, resulting in increased yield. Easy adjustments can be done during production, so stopping the line isn't necessary. Settings can be changed quickly and easily in line with the day's orders for specific tenderloins. The reliable Tendon Trimmer will get the most value out of the tenderloin.

Tenderloin Separator-i

The Tenderloin Separating Module scrapes tenderloins loose from the carcass leaving them partially attached to the end of the keel-bone from which they are peeled manually.

Keel Ribbon Harvester-i

This module is installed under the Halving Module.
Deboned carcasses pass through it on the transport mechanism's return run.
The module removes the keel ribbon left on top of the keelbone after halving and also scrapes any residual meat from the sides of the keelbone.
Tendons and residual meat are discharged via a chute for collection in a container or in the receiving bin of a vacuum transport system.

Cartilage Harvester-i

This module is installed on the transport mechanism's return run shortly before deboned carcasses are unloaded from the system. The module harvests cartilage from the keelbone, a valuable input material for the pharmaceutical industry.
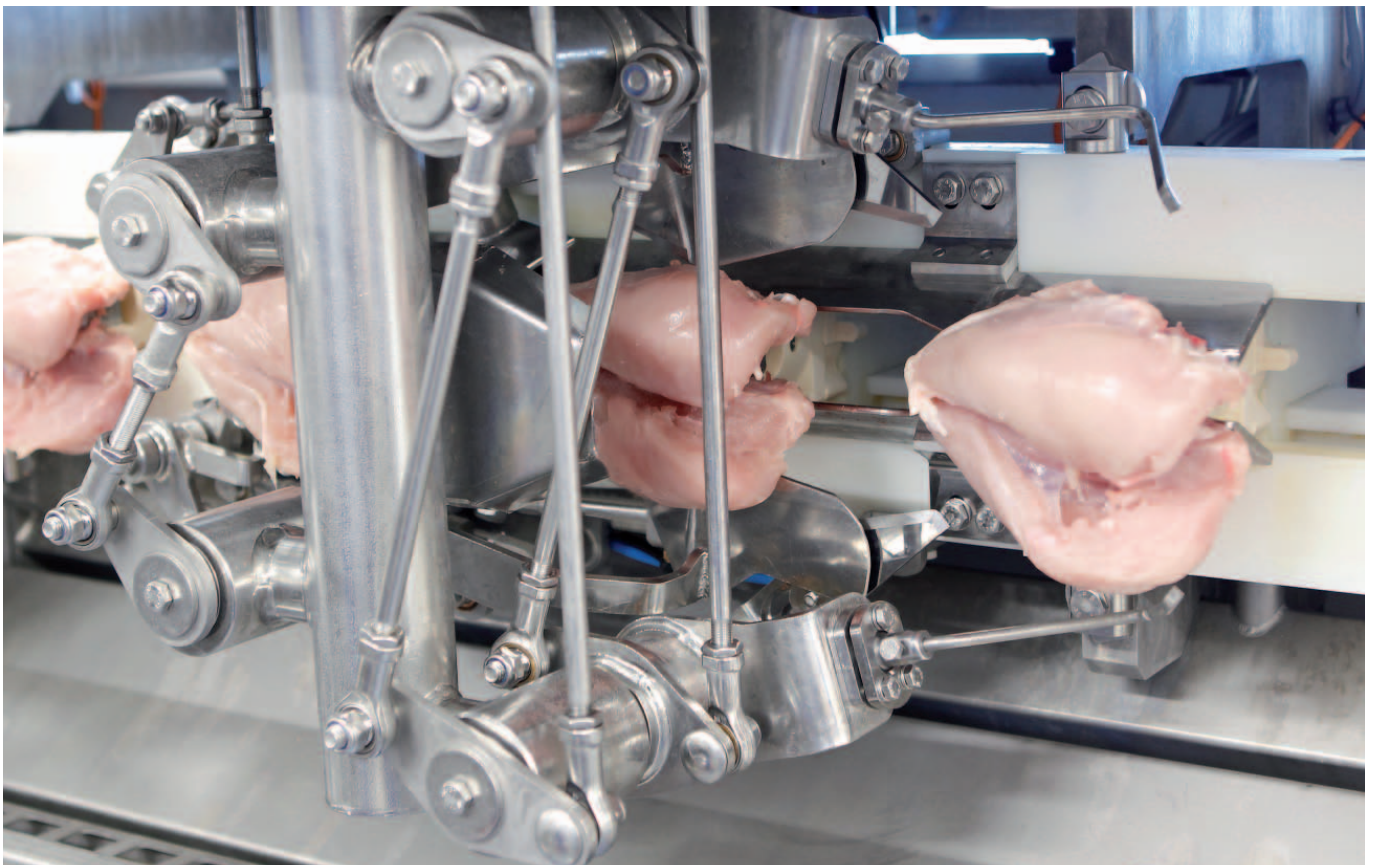
Additions to the system

Besides its modules, the AMF-i system can be enriched with various add-ons and ancillary equipment, which make the filleting operation even more effective.

System Flex logistics integration

To ensure a smooth, uninterrupted flow of products to and from the AMF-i system, a seamless integration with SystemFlex logistics is adding substantial value to your processes. Conveyor belts that take into consideration food safety and food integrity are of crucial importance for the deboning process. This all starts at the beginning when breast caps are loaded onto the SystemFlex buffer belt which takes them to the infeed of the AMF-i system. The buffer belt is controlled by the same operator who feeds the deboner system's semi-automatic breast cap loader. In this way, the flow of products is guaranteed, keeping production efficiency at the highest level.

Furthermore SystemFlex stands for well balanced logistics during the deboning process, facilitating automated or manual filleting operations. Auxiliary options such as work surfaces, trimming tables, crate rack supports and all kinds of conveyor belts make work much easier. All of these SystemFlex components can be supplied as integral parts of the AMF-i system.

By-products

Deboned carcasses are unloaded into an integral receiving bin at the front of the system. This bin is suitable for connection to a vacuum transport system.
Valuable by-products such as skin, wishbones, breast tendons and cartilage leave the system by dedicated chutes and can be collected in containers or in receiving bins connected to a vacuum transport system taking them to a central handling area.

Automatic bone detection

For additional bone-free confidence, fillets from one or more AMF-i lines can be fed to a Marel SensorX bone detection system, where any fillet still containing bone is rejected and can be reworked.

Controls

Processors and dedicated deboning operations handle a range of breast cap weights, often from different breeds of bird. For optimum yield and quality, it is essential that modules are set correctly for the weight of breast cap being processed.

AMF-i features a PLC control solution. Sensors along the system determine the timing of operations such as when a blade begins to cut or the length of cut to be made. Both will depend on breast cap weight. PLC control allows different settings to be stored for different weights. System users can now put together a menu for different breast cap weights, which is accessed via a touch screen located at the system itself. To set the system for a given weight or change to a new weight, the user enters the weight on the touch screen; the PLC system resets the system in an instant. Thanks to PLC control, fewer pneumatic components are needed. As a result, performance is even better and cost of ownership lower.

The touch screen also gives valuable information on system performance and output, on system function and the number of hours worked.

Capacity and weight range

- Up to 3,600 breast caps per hour (60 bpm)
- Breast caps in the range 350g/12.35 oz -900g/31.75 oz.

Advantages at a glance…

- High yield, flexible filleting system
- Handles a wide range of breast cap weights , even non-calibrated
- Intelligent measuring automatically sets modules to product size input and specification
- Optimum deskinning of both matured and non-matured breast caps
- Seamless integration with SystemFlex logistics
- Ensures optimum fillet quality
- Makes a wide range of skin-on and skinless fillet products
- Minimal residual bone
- Careful harvesting of valuable by-products
- Excellent system footprint to capacity ratio
- Low manning levels when fully automated
- Easy to use and maintain
- Low cost of ownership

Marel is the leading global provider of advanced equipment and systems for the fish, meat and poultry industries.

**Marel Stork
Poultry Processing B.V.**
P.O. Box 118,
5830 AC Boxmeer
The Netherlands
t   +31 485 586 111
f   +31 485 586 222
e   info.poultry@marel.com

Marel Inc.

P.O. Box 1258
Gainesville GA 30503
USA
t   +1 770 532 70 41
f   +1 770 532 57 06
e   usa.poultry@marel.com

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