Honest Quality

Chicken Block Manual

Beck

Contents

Introduction to making frozen food blocks with Beck Block Liners®

Welcome to the world of frozen food blocks. Beck Pack Systems developed the process of producing food blocks over 50 years ago. It uses Beck products to help make perfectly uniform and solid blocks of food that can resist dehydration and freezer burn for several years. Read on and let our knowledge assist you in developing the best process to ensure freshness and food safety for your product.

Frozen food blocks are rectangles of fillets, bits and pieces, offcuts, roe, mince, or pulp protected by a Beck Liner®. Fish, chicken, beef, pork, and various foodstuffs are frozen in Beck Liners®. Freshly packed Beck Liners® are placed in horizontal plate freezers for a quick freeze, ensuring the highest product freshness. Frozen foods processed in Beck Liners® are the premier primary product form to be further processed within hours of production or years after being pulled from frozen storage.

The Beck Liner® design protects food blocks better than any other method from packing until the liners are removed, assuring the processors of the highest yields. Frozen blocks' vulnerability to dehydration and oxidation during storage and transport to their next destination is why the Beck Liner® is the most utilized liner in the world. Beck delivers protection throughout the supply chain. Beck's design also ensures food safety and traceability for the customer. The Beck Liners® is the only liner in the world to be FSSC 22000 certified. Your product is safe, as is your investment.

Beck Liners® offers their customers the best-performing liner, which adheres to the food product to protect it yet releases quickly enough to avoid any sticking. This will enable you to experience the highest profits available for your products.

Beck Liners® are part of a system including:

- Beck Liners®.
- Beck Freezer Frames will give shape to the product to be formed.
- Beck Trolley for intermediate storage before freezing.
- Horizontal plate freezers for freezing.
- Beck block ejectors to remove food blocks from the frames after freezing.
- Frame washer for cleaning the frames.
- Further packing system for long-term storage.
- Beck Block Packing Training Seminar.

Secondary processors (i.e., fast food restaurants, wholesalers, and retailers) of food blocks require a nearly perfect rectangle of food with straight edges and sharp corners. Frozen food blocks are stripped of their Beck Liners® and sent through accurate portioning systems. When the block passes through the portioning machine perfectly and produces flawlessly sized burgers, fingers (sticks), portions, nuggets, cubes, or other items, secondary and primary processors are on their way to financial success. Beck Liners® gives you the security of knowing that your blocks will meet and exceed your Version 1.1, 2022 www.beck-liner.com customers' expectations, creating a profitable future for both of you.

Beck guarantees precise liner dimensions and pre-folds the liners for ease and accurate insertion into a Beck Freezer Frame. This is a constant promise from Beck: consistency every time you make a sale.

At the end of the day, Beck Liners® gives you the confidence to know you have the highest-quality product possible, returning to you the highest possible profits.

[1] Please contact Beck Pack Systems A/S to ensure that the Beck Liner® is suitable for your specific foodstuff.

Beck Liners® and frames

There is no better protection for frozen food products than using a Beck Liner®. Beck's Liners® protect your product until the liner is removed for secondary processing.

Beck Liners® are of vital importance in producing top-quality blocks. Beck Liners' role is multi-purpose:

- To prevent the formation of voids (air pockets).
- To protect against freezer burn during plate freezing and cold storage.
- To make a block with sharp edges and corners.
- To adhere just enough to the block surface to protect against freezer burn yet allow easy removal.

No liner or freezing method is better than Beck's at maintaining the delicate balance between two factors. Each Beck Liner® is thick enough to withstand handling during the packing process and will protect the food blocks against damage during storage and transportation. The Beck Liner® is also thin enough to optimize the insulation property and yield the shortest freezing period.

The outside of a Beck Liner®, a proprietary food-grade coating, is impermeable (oxygen barrier), preventing the product's dehydration. During the block ejection process, Beck's coating allows easy separation between the liners and the frames without damaging the liners.

The inner surface of a Beck Liner® gives food blocks an incomparable, completely smooth surface, with an absolute minimum of air pockets. Beck's coating eases the removal of the liners from the food block. Conversely, Beck Liners® adhere to the food blocks to prevent dehydration and freezing burn. The adhesion and release of a Beck Liner® is a delicate balance. You will find your customers extremely satisfied and see them become dependent on your future supplies.

Customers often choose to custom print their Beck Liners® for product differentiation. For example, in the fish sector, multiple products can be packed simultaneously with varying values (i.e., deep skin fillets, skin-on fillets, bits and pieces, mince and roe). Processor logos are also applied to promote brand recognition. Beck Liners can be pre-printed before delivery to the block packer or laser-printed during block production. With our years of printing experience, we look forward to assisting in developing your printing solution and artwork.

Beck certifications

Beck Liners is FSSC 22000 and ISO 9001 certified, among other certifications. Please visit our website, www.beck-liner.com, to view all of Beck's certifications. These certifications enforce our commitment to food safety and traceability.


BUREAU VERITAS
Certification

Beck Pack Systems A/S

Sandemandsvej 6, 3700 Roenne, Denmark

Bureau Veritas Certification Holding SAS, UK Branch certifies that the food safety management system of the above organization has been assessed and complies with the requirements of:

Standard

FOOD SAFETY SYSTEM CERTIFICATION (FSSC) 22000

Certification scheme for food safety management systems, consisting of the following elements:
ISO 22000:2005, ISO/TS 22002-4:2013
and Additional FSSC 22000 requirements V4.1

This certificate is applicable for the scope of

Production of printed and waxed paper for freezing of foodstuff for the food industry.

Product category: I

Certification cycle start date: Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on:	24-05-2018 23-05-2021
Original certification date:	05-10-1999
Certificate No./Version:	DK008290-1
Contract No.	10421214
Issue date:	01-06-2018

FSSC 22000

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Beck Frames

Beck Freezer Frames are approved to package and handle foodstuffs for freezing food blocks. The frames are made of aluminum, are seawater resistant, and have approved material quality for food contact use.

Profiles can vary between U, E, and XU profiles in a single or double frame configuration, with loose or fixed bottoms. U frames are lighter and used more typically in manual operations. Beck XU frames are the most robust freezer frames on the market, offering a heavy-duty alternative typically seen on board fishing vessels. Beck XU frames are designed not to lock into one another and are ideal for conveyors. Beck Freezer Frames are guaranteed to be structurally solid and capable of withstanding the expansion pressure of the freezing block. We guarantee that the final block dimensions will be completely accurate.
Perfectly shaped food blocks are further processed into fingers, burgers, nuggets, cubes, and cutouts. The exact portioning of these items is in stringent demand by the block producers' customers. The strength of the Beck Freezer Frame ensures that food blocks are strong, precisely sized, and have sharp edges. The inside length and width of the new Beck Freezer Frames are within +/- 0.5 mm to guarantee the correct frozen block size and maintain the sharp-edged shape. Double and single frames are available, but most frames used today are the single type. The importance of using Beck liners and frames to ensure the correct size and shape of the final food block will also ensure the highest profits for you and the most excellent yields for your customers.

Regardless of whether Beck U-, E-or XU-profile frames are used, they must be maintained in good condition and cleaned between each freezing cycle. Templates/ frame measurement boards are available to check the proper shape and condition of the frames.

Beck Freezer Frame bottoms

A snug-fitting bottom plate is used below the frame to assist in moving the frame and block from the worktable to the plate freezer. With Beck's years of experience, we can guarantee the best bottom fit and best performance in the block ejector, saving time and money.

Beck Freezer Frame bottoms are made of:

- Stainless Steel AISI304: 0.8 mm, 1.0 mm, 1.25 mm and 1.5 mm
- Aluminum: 2.0 - 3.0 mm

For sanitary reasons, stainless steel bottom plates are recommended.

Do not use bottom trays as lids on top of the block, as it will impair the contact between the block and the plate freezer.

Loose freezer frame bottom
Beck loose Freezer Frame bottoms are removable, making cleaning the frames and bottoms easier with each use.

Attached/fixed freezer frame bottom
Holes are punched in the Beck Freezer Frame Bottoms to allow the Beck Block Ejector pistons to press out the frozen block from the frames. Holes are made to fit Beck ejector loading directions and piston type or per customer requirements.

Please get in touch with Beck for advice about which type of frame and bottom is suitable for your application.

Block forming process for chicken blocks

The process of producing Chicken blocks with Beck Liners® is very similar to producing blocks made from other foods, such as fish. However, some differences require special attention from the block packer. These are the preparation of the raw material and packing weight.

Preparing raw materials

The raw material must be suitable for block making and as dry as possible, as any free chicken juice will lead to ice pockets.

Tumbling the raw material is advisable.

Injection and marinating

Each company has its recipes and methods for injecting and marinating the raw material. The primary purpose of the marination and injection is to add flavor and brine to the chicken and affect the product's final texture, tenderness, mouth feel, and shelf life.

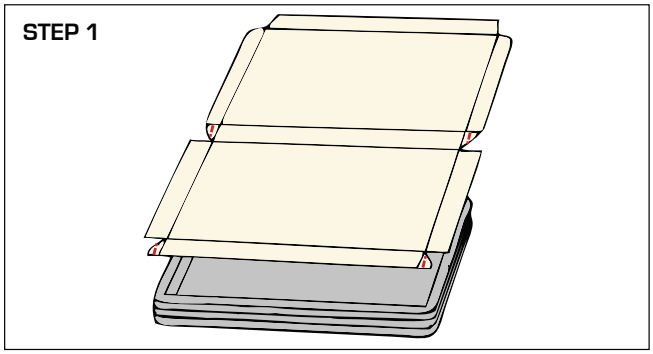
The injection has the advantage of reducing the wetness of the product, which is essential for successful block-making.

Tumbling

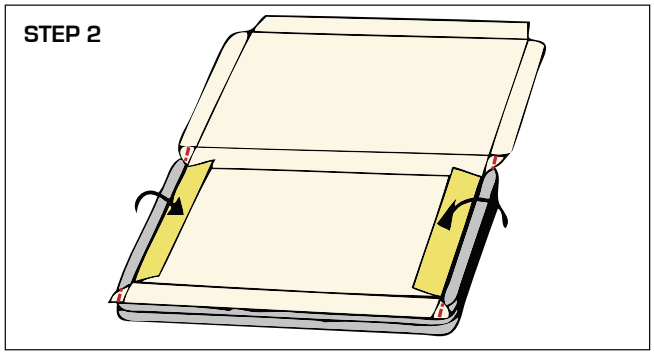
Tumbling stretches the meat's fibers. The brine and marinade are soaked deeper into the meat in a shorter amount of time, increasing yield due to a higher pick-up ratio of brine when tumbling.

Placing a Beck Liner® in a Beck freezing frame

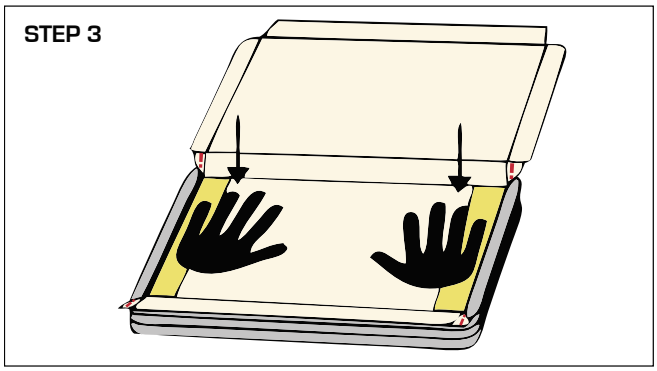
Food products to be frozen into blocks are packed in a Beck Liner®, which rests in the Beck Freezer Frame. A Beck Liner® is inserted into a freezer frame using the following steps. These steps guarantee the correct placement of the flaps, which, in turn, guarantees that your customer will be processing the highest-quality blocks.



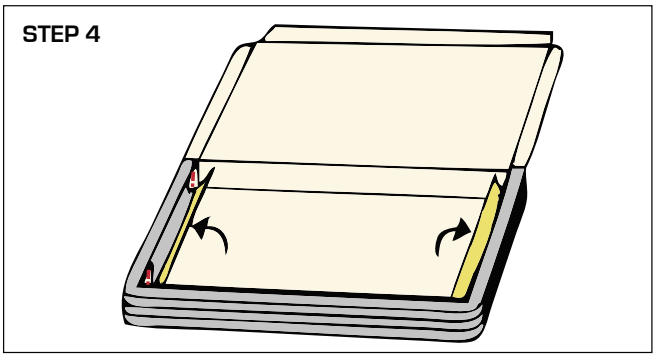
- Set the Beck Liner® above the frame. The lid of the liner is the furthest away from the frame.
- The bottom of the liner should be directly over the frame body. Side flaps will overhang the frame in this position.



- The Beck Liner® will fit inside the frame, and the side flaps will fold into the frame.



- Push the Beck Liner® down and into the frame with both hands.



- Side flaps are folded up to be along the side of the frame.
- The Beck Liner® is ready to have the product (fish, chicken, fruit, etc.) placed inside the liner.
- When complete, the lid can be folded back over the frame.
- Ensure you establish contact between the Beck Liner® and the product to remove air by gently stroking the liner with your hands.
- The three lid flaps (sides and front) are tucked in between the bottom flaps and the frame.
- The packed frame is now ready to go to the plate freezer.

Packing weight

Chicken is denser than fish, which in practice means that the target weight of an industrial-standard chicken block is around 8.0kg +/—2%. The actual target weight depends on the chicken's specific density, whether it's fresh or defrosted, and the amount of marinade and brine added.

The initial infill weight of the chicken meat is to be established by trial-and-error weight tests.

It is important not to overpack or underfill the Beck Liner. Overfilling can cause the liner to burst, and underfilling will lead to craters and air pockets in the block. A block's initial infill (fresh) weight should be slightly higher than the target weight. The extra weight will compensate for water loss during the freezing process.

Packing styles

Chicken fillets
Fillet blocks can be packed randomly or structured by placing the fillets lengthwise in the Beck Liner®. End-user requirements and process speed will determine the chosen packing style.

Chicken mince and offcuts
These blocks may comprise smaller pieces (offcuts) of chicken fillets and partially ground portions.

Freezing the blocks

Once the liners have been filled with product and marked, they are either conveyed or hand-delivered to a plate freezer. It's important not to stack the packed frames on top of each other before plate freezing, as stacking results in excessive pressure on the product, which leads to drip loss and underweight blocks.

Always use a Beck trolley for intermediate storage of packed frames before plate freeing. Beck trolleys are available for single and double frames, and they are easy to transport both packed and empty frames.

It is recommended that intermediate storage (the time between packing and starting freezing) be no more than 30 minutes—this is to reduce drip loss and stress the Beck Liner. However, there should also be sufficient time for the porous inner surface of the liners to absorb the humidity necessary to protect the blocks against dehydration during storage and for the flaps to adhere to the block.

Beck Freezer Frames are made of aluminum, which is an extraordinary cold conveyor. Aluminum is soft enough to be damaged on conveyor belts lined with stainless steel. Aluminum can also be damaged when hit with metal bars that remove the frame and block from the freezer. Any metal (or metal covered with plastic) hit against the frame will cause it to chip and flake minute pieces of aluminum. These tiny fragments WILL find their way into the finished product. This process will result in blocks being rejected by secondary processors at great expense to the block manufacturer.

As a rule, do not allow frames to be damaged during the processing steps. Constant vigilance and checks must be made to ensure the frames are not being damaged.

Horizontal contact plate freezers

Horizontal contact plate freezers offer the best way to freeze and preserve portioned food products while providing ease in handling, transportation, and storage. Beck Liners® packed with product in freezer frames are slid into the plate freezers, in between plates. When the freezer is fully loaded, the operator activates the plates to push them down onto the filled Beck Freezer Frames. The applied pressure pushes the product out into all the air space in the Beck Liner® (in the frame). After freezing, the plates are released, and the frozen product in the frames is removed.

Pressure during freezing must be exerted evenly across the entire block to provide a cohesive block with just the right amount of water retention and maintain smooth, uniform surfaces around the block.

The plate freezers are generally for manual loading and unloading. However, freezers for Automatic operations are available but need more room in the processing plant.

The freezing plant must have ample capacity to operate at an evaporating temperature of -38°C to -40°C to ensure a surface temperature of the freezing plates of approx. -34°C.

The handling time for unloading and loading a plate freezer depends on the size of the plate freezer, the number of Beck Freezer Frames in the freezer, the availability of a total number of packed frames for a freezer, and the quickness of the handling. Generally, the handling time can be estimated to be 15 - 25 minutes. Blocks waiting in the freezer should only be allowed to sit for 30 minutes at maximum. The longer times allow water in the block to drain out, causing ice pocket formation and possible degradation of the liner.

The effective freezing time of freezing blocks to a core temperature of approximately -18°C will typically be 1.5 to 2 hours, provided the freezing plates are free from ice and the bottom plates of the frames are smooth so that good contact is obtained. Note that in a properly functioning plate freezer, the core temperatures of the blocks after freezing can range anywhere from –30 to –10°F (-34 to -23°C).

For most products, a plate pressure of about 0.2 - 0.25 bar for the plate freezers is sufficient.

Crowning: If blocks are taken out of a plate freezer too early, and the core temperature of approx. -18°C (0°F) was not obtained in the plate freezer, a problem will occur. The product will continue to freeze while in the storage freezer without a frame to maintain the proper dimension. Due to the continuous freezing in storage the blocks will expand further, and a curved surface will result.

Rigor: It is vital that all fillets packed into a block have passed through rigor. When pre-rigor or in-rigor fillets are packed in a Beck Liner®, the continuing movement of the fillets will result in breakage of the portions cut from the block in the post freezing manufacturing plant. Product packed in rigor can also cause voids and ice pockets. For example, as fish in rigor release intracellular fluids, even while in the plate freezer, ice pockets can form. When the fillets eventually go through rigor (even during the frozen state), the previously fused fillets will separate.

Ejection of the block from frame

The most common and least damaging method of removing the frozen block from the Beck Freezer Frames is with a pneumatic/hydraulic Beck Block Ejector. A Beck Block Ejector uses metal pistons to push the block of food packed in a Beck Liner® out of the Beck Freezer Frame (through holes in the bottom plate if one is attached).

The colder the block during storage, the more brittle and easily damaged it will be. At –20F (-30°C), the block will maintain its protein quality but can be easily damaged if mishandling occurs. This is why hammers cannot be used to remove the blocks from the frame; they will also crack the frame.

Beck block ejectors come in different versions, from manually operated to fully automatic or custom-made.

The Beck Block Ejector shown below is for single Beck Freezer Frames, hydraulic or pneumatic, and can be equipped with a bucket for a master carton 3 X 16½ lbs. (3 x 7,5 kg).

The Beck Block Ejector shown below is a fully automatic version for single Beck Freezer Frames, hydraulic or pneumatic. The ejector is designed for in-line automatic ejection of frozen blocks.

Storage of frozen products

Blocks to be stored for a long period must be protected against dehydration by being packed into a master carton with a poly bag or stacked on a pallet and wrapped in plastic wrap. It's important to pack the blocks according to end-user requirements.

It is essential to store frozen products in rooms with a stable and even temperature. Fluctuations in the storage temperature will result in dehydration of the product. Long-term cold storage is –2 to –25°F (-19 to -32°C). In reality, 0F (-18°C) is the typical cut-off point for frozen block storage.

When stacking frozen products in a cold store, free space must be left between them and the bulkhead/wall to allow cold air to circulate. If the product is stacked entirely against the bulkhead/wall, it might easily be spoiled by heat penetration from the outside.

Cleaning of equipment and maintenance

Time must be set aside for cleaning and maintaining freezing equipment. A rule of thumb is to set aside 1 hour per day for cleaning and defrosting each plate freezer.

During that hour, the freezer can be defrosted, as ice formation on the freezing plates (insulation) extends freezing time and causes deformations (dents) to the bottom plates of the frames.

Frame washer

A frame washer cleans the frames after the blocks have been ejected. Cleaned frames are typically conveyed back to the parking area.

Secondary processing requirements

The most commonly used liner for secondary seafood processors is a Beck Liner®. Many require Beck Liners® because they can confidently know they have purchased the highest-quality product available. A block of frozen food has an average dimension of 482 x 254 x 62.7 mm.

Tolerances for the block dimensions are typically as follows:

Length: 482 mm +/- 1.0 mm
Width: 254 mm +/- 1.0 mm
Height: 62.7 mm +/- 0.9 mm

Secondary processors portion frozen blocks into burgers, fingers (sticks), portions, nuggets, cubes, and other forms.

Quality considerations

Even with the use of first-class raw materials, the right frames, and high-quality liners, the final block products can be disappointing and, in the worst case, rejected by the buyers.

The following items have resulted in low prices or rejected blocks:

- Unacceptable quality of the product.
- Inaccurate weighing of the product into the liners.
- Careless work when filling the product mass into the liners. Care has to be taken to fill all corners.
- Wrong insertion of the liner into the frame, leading to embedded flaps.
- Inaccurate freezing frames result in block dimensions that are out of specifications. Liners lower than 1 mm above the frame will not encounter sufficient pressure on the block.
- If the freezing takes place immediately after packing, there might not be sufficient time for the porous inner surface of the liners to absorb the humidity necessary to protect the blocks against dehydration during storage. Having a standing time of a minimum of 10 minutes is recommended. Note that the minimu
- Stand time may vary depending on the food type and free moisture content.
- If the freezing occurs too long after packing, the liners might turn soft, giving the risk of residual liner sticking to the blocks during unpacking, and the drip loss may lead to underweight blocks. The processing area where the packed frames are waiting should be kept as low as possible but not at freezing temperatures.
- If packed frames have been placed into an operating plate freezer gradually after being packed (using the freezer as a rack), it may result in a shell-freezing of the blocks, which cannot be pressed homogeneously during the freezing period. Due to this, the fish blocks might develop air
- pockets and curved surfaces and craters.

Block packing training workshops

Beck conducts block-packing training workshops for both new and existing customers. The workshops are targeted to personnel working directly or indirectly with block packing, such as operators, floor managers, packing buyers, and quality managers. They consist of presentations, e-learning, and practical training and teach you how to identify and solve typical block-quality problems.

Please get in touch with us for more information and to book a block packing training seminar.

Conclution

With over 50 years of experience behind every Beck Liner® and Freezer Frame, the highest possible quality of your food blocks can be assured.

If you are considering a block production, please get in touch with our salespeople or agents to assist you in your project.

Beck

If you need further information about block production, block products, machinery, and developments, please do not hesitate to contact us.

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