Block Packers Guide
# Table of Contents

- **INTRODUCTION TO THE BLOCK MAKING PROCESS** ........................................... 5
- **DEFINITION OF A BLOCK** .................................................................................. 6
- **BECK LINERS AND FRAMES** ............................................................................ 7
- **BECK LINERS** ..................................................................................................... 7
- **BECK FRAMES** ................................................................................................... 8
  - **DIMENSIONS OF SINGLE FRAMES** ............................................................... 9
  - **DIMENSIONS OF DOUBLE FRAMES** .............................................................. 9
- **FREEZER FRAME BOTTOMS** .......................................................................... 10
  - **LOOSE FREEZER FRAME BOTTOM** ................................................................. 10
  - **ATTACHED FREEZER FRAME BOTTOM** ....................................................... 10
- **BLOCK FORMING PROCESS** ........................................................................... 11
- **PACKING A BECK LINER** ................................................................................ 12
- **HORIZONTAL CONTACT PLATE FREEZERS** ................................................... 15
- **EJECTION OF THE BLOCK FROM FRAME** .................................................... 17
- **STORAGE OF FROZEN PRODUCTS** ................................................................ 17
- **CLEANING OF EQUIPMENT & MAINTENENCE** ............................................ 18
- **QUALITY CONSIDERATIONS** .......................................................................... 20
- **EUROPEAN STANDARD FOR QUICK FROZEN BLOCKS** ................................. 21
- **UNITED STATES STANDARDS FOR GRADES FISH BLOCKS** .......................... 29
- **US FDA - GOOD MANUFACTURING PRACTICES (GMP)** ............................... 34
- **CONTACT INFORMATION WORLDWIDE** ...................................................... 39
INTRODUCTION TO THE BLOCK MAKING PROCESS

A frozen food block is a rectangle of fillets, bits and pieces, mince, or pulp protected by a carton (Beck Liner). Types of food packed in liners are fish, chicken, beef, pork, and various types of fruit and vegetables. Once packed, the blocks are placed in horizontal plate freezers for a quick freeze ensuring product freshness. The frozen blocks typically serve as a primary product form to be further processed within hours of production or years later after being pulled from frozen storage.

The purpose of a Beck Liner is to protect food blocks from the time of packing until the cartons are removed. Frozen blocks are vulnerable to dehydration and oxidation during storage and transport to their next destination. Quality of the finished food blocks strongly depends on the liners used during the freezing process. Beck Liners are designed to protect their products and also to be removed easily at the end of that process.

Beck Liners are part of a system including the liners (cartons), a freezing frame to give shape to the product to be formed, horizontal plate freezers for freezing, ejectors to remove the blocks of food from the frames after freezing, a frame washer for cleaning and a further packing system for long term storage.

Secondary processors of food blocks require a nearly perfect rectangle of food with straight edges and sharp corners as the blocks are sent through very accurate portioning systems. It is imperative to have the correct liner dimensions and all the folding lines pre-folded. A good quality plate freezer ensures a uniform block surface with the correct amount of water retention in the block due to even plate pressure.

The finished frozen blocks are portioned by secondary processors into burgers, fingers (sticks), portions, nuggets, cubes and other forms.
DEFINITION OF A BLOCK

A food block is a uniform, compact and cohesive mass of fish, chicken, beef, pork, fruit pulp, vegetable or other food frozen together under high pressure in a horizontal plate freezer.

A typical block is 7.48 kg (16.5 lbs.). This size was decided on over the course of many years determined by optimal freezing times, ease in handling by laborers and by requirements of the secondary processors.

Typical block sizes can range from small retail portions to larger wholesale units, customized to industry needs.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.48 kg</td>
<td>48.25 cm x 25.40 cm x 6.35 cm</td>
</tr>
<tr>
<td>(16.5 lbs)</td>
<td>( 19 inches x 10 inches x 2.5 inches)</td>
</tr>
</tbody>
</table>
BECK LINERS AND FRAMES

Beck Liners

A Beck Liner is a paperboard coated in wax. The liner protects frozen food products until the carton is removed for secondary processing. Top quality food blocks depend highly on liners with the right fiber structure, board strength, coating, and water absorption of the inner surface.

The liner is of vital importance in producing acceptable quality blocks. Its role is multi-purpose:
1) To prevent formation of voids (air pockets)
2) To protect against freezer burn during plate freezing and during cold storage
3) To make a block with sharp edges and corners
4) To adhere just enough to the block surface to protect against freezer burn yet allow easy removal without the liner sticking to the block surface.

Board thickness of a liner is a compromise between two factors. Each liner must be thick enough to withstand handling during the packing process and must protect the fish blocks against damage during storage and transportation. The liner must also be thin enough to optimize the insulation property as well as yield the shortest freezing period.

The coating on the outside of the cartons, paraffin wax, has to be impermeable to prevent dehydration of the product. During the block ejection process the coating has to allow easy separation between the liners and the frames without any damage to the liners and in such a way that no residual board remains on the frames. Further, the liners and their coating must not be damaged by heat if plastic shrinkage packing is used instead of corrugated cardboard master cartons.

The coating of the inner surface of the liners must give the food blocks a completely smooth surface, with an absolute minimum of air pockets. Further, the coating must ease the removal of the liners from the food blocks and assure that no paperboard pieces remain on the blocks. However, the liners must also stick to the food blocks to prevent dehydration and freezing burns. And more importantly, the inner surface must have a sufficient porosity to absorb moisture necessary to protect the fish blocks against dehydration during storage.

Customers often choose to custom print their Beck Liners. This aids them in product differentiation. For example, in the fish sector, there can be multiple products packed at one time with varying values (i.e. deep skin fillets, fillets, skin-on fillets, bits and pieces, mince and roe). Processor logos are also applied to promote brand recognition.
**Beck Frames**

Frames for freezing food blocks are made of sea water resistant aluminum. Profiles can vary between U and XU profiles, in a single or double frame configuration. U Frames are lighter and used more typically in manual operations. XU Frames are the strongest freezer frame on the market offering a heavy duty alternative typically seen on board fishing vessels.

Perfectly shaped food blocks are further processed into fingers, burgers, cubes, and cutouts. Exact portioning of these items is a stringent demand by the block producers’ customers. It is important that frames are strong, precisely sized and have sharp edges. The inside length and width of new frames should be within +/- 0.5 mm to guarantee 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.

Regardless of whether U-profile or XU-profile frames are used, the frames must be maintained in good condition and be correctly aligned if they are damaged or bent. Dial gauges and templates are available to check on the proper shape and condition of the frames.
**Dimensions of Single Frames**

<table>
<thead>
<tr>
<th>Inside Dimension</th>
<th>Outside Dimension</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>485 x 255 mm</td>
<td>525 x 295 mm</td>
<td>59 mm</td>
</tr>
</tbody>
</table>

**Dimensions of Double Frames**

<table>
<thead>
<tr>
<th>Inside Dimension of Individual Block Area.</th>
<th>Outside Dimension of Entire Frame(2 Block Areas.)</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>485 x 255 mm</td>
<td>1018 x 295 mm</td>
<td>59 mm</td>
</tr>
</tbody>
</table>
FREEZER FRAME BOTTOMS

A snug fitting bottom plate is used below the frame to assist moving the frame and block from the worktable to the plate freezer.

Freezer frame bottoms are made of:

<table>
<thead>
<tr>
<th>Material</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel</td>
<td>0.8, 1.0, 1.25 and 1.5 mm</td>
</tr>
<tr>
<td></td>
<td>20 gauge (U.S.)</td>
</tr>
<tr>
<td>Galvanized Steel</td>
<td>1.0, 1.25 and 1.5 mm</td>
</tr>
<tr>
<td>Aluminum</td>
<td>2.0 – 3.0 mm</td>
</tr>
</tbody>
</table>

Loose Freezer Frame Bottom

At a land plant, frame bottoms are often removable so that with each use, cleaning of the frames and bottoms is easier. Also, removable bottoms do not get damaged as often as those fixed to the frames.

Land plants primarily use loose bottoms while at-sea processors typically use those that are attached. For sanitary reasons, stainless steel bottom plates are recommended for both applications.

Attached Freezer Frame Bottom

Holes must be in the fixed frame bottoms to allow pistons on the block ejector to press out the frozen block from the frames. These ejector pistons may leave small marks on the fish blocks.
BLOCK FORMING PROCESS

Packing a Liner in a Frame

Food products to be frozen into blocks are packed in a Beck Liner which rests in an aluminum freezer frame. A Beck Liner is inserted into a freezer frame using the following steps:

Set the liner above the frame. The top section of the liner is the furthest away from the frame.

The bottom of the liner should be directly over the frame body. Tab section will overhang the liner in this position.

Placing Liner

The liner will fit inside of the frame and the Tabs will fold into the frame.

Initial Alignment

Push the liner down and into the frame with both hands.

Final Placement

Side flaps are folded up to be along the side of the frame.

The Beck Liner is now ready to have the product (fish, chicken, fruit, etc.) placed inside of the liner.

When full, the top flap can be folded back over the frame. The three top flaps (sides and front) are tucked in between the bottom flaps and the frame body.

Flaps up & Liner Ready to Fill

The Frame is now ready to go to the plate freezer.
There are several types of frame profiles mentioned above. It is important that this profile is structurally strong and capable of withstanding the expansion pressure of the freezing block. A strong frame insures that final block dimensions will be completely accurate.

Most frames are made of aluminum. Aluminum is soft enough that it will be damaged on conveyor belts lined with stainless steel or from metal bars used to remove the frame and block from the freezer. Any metal 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 customers at great expense to the manufacturer of the block. As a rule: DO NOT ALLOW FRAMES TO BE DAMAGED IN THE PROCESSING STEPS. Constant vigilance and checks must be made to assure the frames are not being damaged.

It is very important that the frame and the liner (into which the fish fillets are packed) be matched. The most utilized liner is 1 mm higher than the frame wall. This insures that as the block freezes the expanding mass will fill out the liner evenly and have square corners. This configuration also allows for continuous contact with the plate freezer at all times during the process.

**PACKING A BECK LINER**

After the fresh or thawed food products have been processed into fillets, bits and pieces, mince or pulp, they are portioned into the Beck Liner which has been placed into a freezer frame.

**Fillet**

Fillet blocks are normally packed with the fillets placed lengthwise in the Beck Liner. The butt ends of the fillets are placed flush against the liner with the tails towards the center with none of the fillets folded over. It is important to keep the fillets straight and flat to avoid areas where water is able to build up. Fillets must be laid in the liner in a staggered or shingled manner to even out the pack height. Large fillets must be cut to avoid the formation of internal voids and ice pockets.

**Fish Fillets**

1) Long Pack. The flesh sides of the fillets (the side from the center of the fishs body) are all oriented in one direction, facing towards the top and bottom of the block. This keeps the skin or fattier sides of the fillets more protected and reduces oxidation and early rancidity of that area of the fillet. The initial infill (fresh) weight of a desired 16.5 lb block should be packed at 17.0 lbs (7.7 kg). The extra weight will allow for water loss during the freezing process. Note: the over pack
is dependent upon free moisture content of the fillets, possible storage time and temperature and customer desires. As a rule, overfilling reduces surface pockets and voids but also depends on the elasticity of the fillets. Sometimes a 1% phosphate solution must be added to the fillet block during packing to aid in the best finished block conformation.

2) Sandwich pack. Both the top and bottom layers of the block are packed as in the typical long pack block. The difference is that the center of the block is filled with a jumble of fillets without any specific orientation. Folding and twisting of the fillets in the center of this style is acceptable. Fillets on the top and bottom of the block serve as anchors for the interior and give the block strength to withstand cutting/portioning. Care must be taken to insure that no internal ice pockets and/or voids are created in this procedure. To minimize this risk, it is imperative that the fillets be somewhat dry and folded over rather than a 100% random jumble. A Sandwich block is usually faster to pack than the more carefully packed longpack block.

3) Strip Block. This is when fillets are sliced lengthwise by rotation knives set at ¾ to 1 inch (19-25 mm) apart. The sliced fillets are dumped into the block liner and frozen. No layering on the top and bottom surface is needed as in the Sandwich style. The fillets should be dryer than a typical Long pack. This style of block is very rapid to produce and the lines that make it can be semi-mechanized to reduce labor costs.

4) Scramble Block. This is a form of Sandwich Block without the necessary alignment at the top and bottom of the block. Whole fillets are used. To avoid internal ice/void problems, it is extremely important that the fillets be out of rigor and dry. Input weight may have to be increased from the normal ½ lb(.23 kg) by trial and error weight tests.

**BITS AND PIECES AND MINCE**
These are the easiest and most tolerant of the packing styles. These blocks may be composed of trimmings, pieces of fillets and partially ground portions. The major difference between minced blocks and fillet blocks is that the raw input weight must be increased to approximately 6 oz.(170 grams) over the desired frozen net weight. This is due to the increased moisture content in the minced flesh. As in fillet blocks, trial and error will determine the exact input weight. To avoid drip losses, it will be necessary to keep the raw material to be minced as free of excess moisture as is possible. Another key advantage to minced block is that with the proper piping and pumps, the mince can be moved anywhere in the factory to a packing location. In addition, the process can be mechanized with automated weigh portioners.
Baader mincing machines are the most common for mincing fillets. A 3mm or 5 mm screen is typically used for fish. The 3mm screen prevents any bones and fins and larger parasites from passing into the finished product without harming the texture. The larger the screen size the tougher the finished texture and the more bone and parasite defects allowed into the product. Care must be taken to use proper pumping equipment. Aggressive pumps can damage the protein of the small pieces and result in a tough finished texture. Pulping machines also damage the final texture.

When factories are packing multiple products (i.e. fillets and mince) care must be taken not to mix the various styles in finished packaging. The easiest way to do this is through custom printing the Beck Liners. Below are samples of Beck’s standard red and blue striped liners.
FREEZING THE BLOCKS

Once the liners have been filled with product they are either conveyed or hand delivered to a plate freezer.

HORIZONTAL CONTACT PLATE FREEZERS

Horizontal contact plate freezers offer the best way to freeze and preserve portioned food products while providing ease in handling, ease in transportation and ease during storage. 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 down onto the filled frames. The applied pressure pushes product out into all the air space in the 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, 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 operation 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 of a plate freezer depends on the size of the plate freezer, the number of frames in the freezer, availability of a full number of packed frames for a freezer and the quickness of the handling. Generally, the handling time can be
estimated to 15 - 25 minutes. Blocks waiting in the freezer should never be allowed to sit for longer than 45 minutes. The longer times allow water in the block to drain out of the block, causes ice pocket formation and possible degradation of the liner.

The effective freezing time of freezing blocks to a core temperature of approx. -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, core temperatures of the blocks after freezing can range anywhere from –30 to –10 F(-34 to -23C).

For most products a plate pressure of the plate freezers of about 0.2 - 0.25 bar is sufficient. However, for blocks, which are to be cut up into "fingers"/ portions, a plate pressure of 0.5 - 0.7 bar is often required to make sure that the blocks are homogeneous and without air pockets.

The freezing process causes the high moisture fillets to expand by as much as 7%. This expansion is in all directions but is most pronounced at the top surface. Freezers designed for this operation have pressure relief valves, which allow the plates to move and thus allow most of the expansion to raise the top edge of the block. The pressure also causes the fillets to press against each other and literally fuse together into a single block of flesh. Note that voids can be caused by a lack of sufficient plate freezer pressure on the block or by lack of sufficient flesh in the liner.

Crowning: If blocks are taken out of a plate freezer too early, and the core temperature of approx. -18C 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 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 frames is with a pneumatic/electric ejector. Hydraulic/electric ejectors are also available by custom order. Small operations can use hand-operated presses but larger factories usually rely on automatically fed and operated ejectors. This type of device uses a metal piston to push the block out of the frame (through holes in the bottom plate if one is attached).

The colder the block during storage results in very brittle and easily damaged block. At –20F(-30C) 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. It will also crack the frame.

The ejector shown on this page is for single frames, hydraulic and equipped with a bucket for a master carton 3 X 16½ lbs. (3 x 7.5 kg).

STORAGE OF FROZEN PRODUCTS

A. Blocks to be stored for a long period must be protected against dehydration by being packed into a master carton with poly bag or stacked on a pallet and wrapped in plastic wrap.
B. It is important to store frozen products in rooms with a stable and even temperature. Fluctuations of the storage temperature will result in dehydration of the product. Long-term cold storage is –2 to –25F (-19 to -32C). In reality, 0F (-18C) is the typical cut off point for frozen block storage.
C. When stacking the frozen product in a hold/room it is necessary to leave a free space between the product and the bulkhead/wall to allow the cold air to be circulated. If product is stacked entirely against the bulkhead/wall it might easily be spoiled by heat penetrating from the outside.
CLEANING OF EQUIPMENT & MAINTENENCE

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

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

FRAME WASHER

A frame washer is used to clean the frames after the blocks have gone through the ejection process. Cleaned frames are typically conveyed back to the pack area.
SECONDARY PROCESSING REQUIREMENTS

For secondary seafood processors, the commonly used 16.5 lb (7.5 kg) block of frozen fish have averages in dimensions of 482 x 254 x 62.7 mm. Tolerances for the block dimensions are as follows:

- Length: 482 mm +/- 1.0 mm
- Width: 254 mm +/- 1.0 mm
- Height: 62.7 mm +/- .9 mm

98% of all blocks must be longer than 480 mm, wider than 252 mm and higher than 60.9 mm. Blocks shorter than 479 mm, narrower than 251 mm or lower than 60 mm are not acceptable.

The average weight of all the blocks must be within 7,484 grams +/- 55 grams. 98% of all blocks must contain more than 7,400 grams while none of the blocks must contain less than 7,300 grams.

Frozen blocks are portioned by secondary processors into burgers, fingers (sticks), portions, nuggets, cubes and other forms. Below is an example of how a 16.5 lb block is cut into fingers.
QUALITY CONSIDERATIONS

Even with the use of first class raw materials, the right frames and high-quality cartons 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:

A. Unacceptable quality of the product.
B. Inaccurate weighing of the product into the cartons.
C. Careless work when filling the product mass into the cartons. Care has to be taken to fill all corners.
D. Inaccurate freezing frames.
E. Poor quality of the liners.
F. The cartons not being at least 1 mm higher than the frames gives insufficient or no pressure on the blocks.
G. The period between packing of frames and freezing varies from 1/2 to 1 hour. If the freezing takes place relatively quickly after the packing, it is advantageous to place the packed frames on top of each other so that the resulting pressure can force the product out to all edges and corners. If freezing of the packed frames is delayed for a longer period, they should be placed in the shelved racks to avoid risk of liquid loss resulting in loss of weight and also in reduced quality. When delayed freezing is the case, the temperature of the processing area where the packed frames are waiting should be kept at a temperature as low as possible, but not a freezing temperature.
H. 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.
I. 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.
J. If packed frames have been placed into an operating plate freezer gradually after they are being packed (using the freezer as a rack), it may result in a shell-freezing of the blocks, which cannot afterwards be pressed homogeneously during the freezing period. Due to this, the fish blocks might develop air pockets and/or curved surfaces.
EUROPEAN STANDARD FOR QUICK FROZEN BLOCKS

CODEX STAN 165-1989 (REV. 1 - 1995)

1. SCOPE
This standard applies to quick frozen blocks of cohering fish flesh, prepared from fillets or minced fish flesh or a mixture of fillets and minced fish flesh, which are intended for further processing.

2. DESCRIPTION
2.1 PRODUCT DEFINITION
Quick frozen blocks are rectangular or other uniformly shaped masses of cohering fish fillets, minced fish or a mixture thereof, which are suitable for human consumption, comprising: (i) a single species; or (ii) a mixture of species with similar sensory characteristics.
2.1.1 Fillets are slices of fish of irregular size and shape which are removed from the carcass by cuts made parallel to the back bone and pieces of such fillets, with or without the skin.
2.1.2 Minced fish flesh used in the manufacture of blocks are particles of skeletal muscle which have been separated from and are essentially free from bones, viscera and skin.
2.2 PROCESS DEFINITION
The product after any suitable preparation shall be subjected to a freezing process and shall comply with the conditions laid down hereafter. The freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C or colder at the thermal centre after thermal stabilization. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution. Industrial repacking or further processing of intermediate quick frozen material under controlled conditions which maintain the quality of the product followed by the reapplication of the quick freezing process is permitted. These products shall be processed and packaged so as to minimize dehydration and oxidation.
2.3 PRESENTATION
Any presentation of the product shall be permitted provided that it:
2.3.1 meets all requirements of this standard, and
2.3.2 is adequately described on the label to avoid confusing or misleading the consumer.
2.3.3 Blocks may be presented as boneless, provided that boning has been completed including the removal of pin-bones.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS
3.1 FISH
Quick frozen blocks shall be prepared from fillets or minced flesh of sound fish which are of a quality fit to be sold fresh for human consumption. 1 Including pieces of fillets.
3.2 GLAZING
If glazed, the water used for glazing or preparing glazing solutions shall be of potable quality or shall be clean sea-water. Potable water is fresh-water fit for human consumption. Standards of potability shall not be less than those contained in the latest edition of the WHO "International Guidelines for Drinking Water Quality". Clean sea-water is sea-water which meets the same microbiological standards as potable water and is free from objectionable substances.

3.3 OTHER INGREDIENTS
All other ingredients used shall be of food grade quality and conform to all applicable Codex standards.

3.4 DECOMPOSITION
The products shall not contain more than 10 mg/100 g of histamine based on the average of the sample unit tested. This shall apply only to species of Clupeidae, Scombridae, Scombresocidae, Pomatomidae and Coryphaenidae families.

3.5 FINAL PRODUCT
Products shall meet the requirements of this standard when lots examined in accordance with Section 9 comply with the provisions set out in Section 8. Products shall be examined by the methods given in Section 7.

4. FOOD ADDITIVES
Only the use of the following additives is permitted.

Additive Moisture/Water Retention Agents Maximum Level in the Final Product

339(i) Monosodium orthophosphate
340(i) Monopotassium orthophosphate
450(iii) Tetrasodium diphosphate
450(v) Tetrapotassium diphosphate
451(i) Pentasodium triphosphate
451(ii) Pentapotassium triphosphate
452(i) Sodium polyphosphate
452(v) Calcium, polyphosphates 10 g/kg expressed as P2O5, singly or in combination (includes natural phosphate)
401 Sodium alginate GMP

Antioxidants
300 Ascorbic acid
301 Sodium ascorbate
303 Potassium ascorbate GMP
304 Ascorbyl palmitate 1 g/kg

In Minced Fish Flesh Only
Acidity Regulator
330 Citric acid
331 Sodium citrate
332 Potassium citrate
GMP

CODEX STAN 165-1989

3

Thickeners

412 Guar gum

410 Carob bean (Locust bean) gum

440 Pectins

466 Sodium carboxymethyl cellulose

415 Xanthan gum

407 Carrageenan and its Na, K, NH4 salts (including Furcelleran)

407a Processed *Eucheuma* Seaweed (PES)

461 Methyl cellulose GMP

5. HYGIENE AND HANDLING

5.1 The final product shall be free from any foreign material that poses a threat to human health.

5.2 When tested by appropriate methods of sampling and examination prescribed by the Codex Alimentarius Commission, the product:

(i) shall be free from microorganisms or substances originating from microorganisms in amounts which may represent a hazard to health in accordance with standards established by the Codex Alimentarius Commission;

(ii) shall not contain histamine that exceeds 20 mg/100 g in any sample unit. This applies only to species of Clupeidae, Scombridae, Scombresocidae, Pomatomidae and Coryphaenedae families;

(iii) shall not contain any other substances in amounts which may represent a hazard to health in accordance with standards established by the Codex Alimentarius Commission.

5.3 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice - General Principles of Food Hygiene (CAC/RCP 1-1969) and the following relevant Codes:

(i) The Recommended International Code of Practice for Frozen Fish (CAC/RCP 16-1978);

(ii) The Recommended International Code of Practice for Frozen Battered and/or Breaded Fishery Products (CAC/RCP 35-1985);


(v) The sections on the Products of Aquaculture in the Proposed Draft International Code of Practice for Fish and Fishery Products (under elaboration). The Proposed Draft Code of Practice, when finalized, will replace all current Codes of Practice for Fish and Fishery Products.

6. LABELLING
In addition to the provisions of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985) the following specific provisions apply;

6.1 THE NAME OF THE FOOD
6.1.1 The name of the food shall be declared as "x y blocks" in accordance with the law, custom or practice of the country in which the product is distributed, where "x" shall represent the common name(s) of the species packed and "y" shall represent the form of presentation of the block (see Section 2.3).
6.1.2 If the product has been glazed with sea-water, at statement to this effect shall be made
6.1.3 The name "quick frozen", shall also appear on the label, except that the term "frozen" may be applied in countries where this term is customarily used for describing the product processed in accordance with subsection 2.2 of this standard.
6.1.4 The proportion of mince in excess of 10% of net fish content shall be declared stating the percentage ranges: 10-25, >25-35, etc. Blocks with more than 90% mince are regarded as mince blocks.
6.1.5 The label shall state that the product should be maintained under conditions that will maintain the quality during transportation, storage and distribution.

6.2 NET CONTENTS (GLAZED BLOCKS)
Where the food has been glazed, the declaration of net contents of the food shall be exclusive of the glaze.

6.3 STORAGE INSTRUCTIONS
The label shall include terms to indicate that the product shall be stored at a temperature of -18°C or colder.

6.4 LABELLING OF NON-RETAIL CONTAINERS
Information specified above shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer as well as storage instructions, shall appear on the container. However, lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark provided that such mark is clearly identifiable with the accompanying documents.

7. SAMPLING, EXAMINATION AND ANALYSES
7.1 SAMPLING PLAN FOR FISH BLOCKS
Sampling of lots for examination of the product shall be in accordance with the sampling plan defined below. The sample unit is the entire block.

CODEX STAN 165-1989 5

<table>
<thead>
<tr>
<th>Lot Size</th>
<th>Sample Size</th>
<th>Acceptance number</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&lt; 15)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>(16 - 50)</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

24
If the number of defective blocks in the sample is less than or equal to c, accept the lot; otherwise, reject the lot.

(ii) Sampling of lots for examination of net weight shall be carried out in accordance with an appropriate sampling plan meeting the established criteria established by the CAC.

7.2 SENSORY AND PHYSICAL EXAMINATION
Samples taken for sensory and physical examination shall be assessed by persons trained in such examination and in accordance with procedures elaborated in Sections 7.3 through 7.7 and Annex A and in accordance with the Code of Practice for the Sensory Evaluation of Fish and Shellfish (under development).

7.3 DETERMINATION OF NET WEIGHT
7.3.1 Determination of Net Weight of Product Not Covered by Glaze
The net weight (exclusive of packaging material) of each sample unit representing a lot shall be determined in the frozen state.

7.3.2 DETERMINATION OF NET WEIGHT PRODUCTS COVERED BY GLAZE
As soon as the package is removed from frozen temperature storage, open immediately and place the contents under a gentle spray of cold water until all ice glaze that can be seen or felt is removed. Remove adhering water by the use of paper towel and weigh the product. An alternate method is outlined in Annex B.

7.4 PROCEDURE FOR THE DETECTION OF PARASITES FOR SKINLESS BLOCKS OF FISH (TYPE 1 METHOD)
The entire sample unit is examined non-destructively by placing appropriate portions of the thawed sample unit on a 5 mm thick acryl sheet with 45% translucency and candled with a light source giving 1500 lux 30 cm above the sheet.

CODEX STAN 165-1989 6

7.5 DETERMINATION OF PROPORTIONS OF FILLET AND MINCED FISH IN QUICK FROZEN BLOCKS PREPARED FROM MIXTURES OF FILLETS AND MINCED FISH 3 4
According to the AOAC Method - "Physical Separation of Fillets and Minced Fish", AOAC 1988, 71, 206 (Type II).

7.6 DETERMINATION OF GELATINOUS CONDITION

7.7 COOKING METHODS
The following procedures are based on heating the product to an internal temperature of 65 -70°C. The product must not be overcooked. Cooking times vary according to the size of the product and the temperatures used. The exact times and conditions of cooking for the products should be determined by prior experimentation.
Baking Procedure: Wrap the product in aluminum foil and place it evenly on a flat cookie sheet or shallow flat pan.
Steaming Procedure: Wrap the product in aluminum foil and place it on a wire rack suspended over boiling water in a covered container.
Boil-In-Bag Procedure: Place the product into a boilable film-type pouch and seal. Immerse the pouch into boiling water and cook.
Microwave Procedure: Enclose the product in a container suitable for microwave cooking. If plastic bags are used, check to ensure that no odor is imparted from the plastic bags. Cook according to equipment instructions.

7.8. THAWING PROCEDURE FOR QUICK FROZEN BLOCKS

Air Thaw Method:
Frozen fish blocks are removed from the packaging. The frozen fish blocks are individually placed into snug fitting impermeable plastic bags or a humidity controlled environment with a relative humidity of at least 80%. Remove as much air as possible from the bags and seal. The frozen fish blocks sealed in plastic bags are placed on individual trays and thawed at air temperature of 25°C (77°F) or lower. Thawing is completed when the product can be readily separated without tearing. Internal block temperature should not exceed 7°C (44.6°F).

Water Immersion Method:
Frozen fish blocks are removed from the packaging. The frozen fish blocks are sealed in plastic bags. Remove as much air as possible from the bags and seal. The frozen fish blocks are placed into a circulating water bath with temperatures maintained at 21°C + 1.5°C (70°F + 3°F). Thawing is completed when the product can be easily separated without tearing. Internal block temperature should not exceed 7°C (44.6°F).

7.9 DETERMINATION OF HISTAMINE


8. DEFINITION OF DEFECTIVES

The sample unit shall be considered defective when it exhibit any of the properties defined below. 3 This method has been evaluated for cod only but, in principle, should be appropriate to other fish species or mixed species. 4 This method is accurate for levels of mince greater than 10%.

CODEX STAN 165-1989 7

8.1 DEEP DEHYDRATION

Greater than 10% of the surface area of the sample unit exhibits excessive loss of moisture clearly shown as white or yellow abnormality on the surface which masks the colour of the flesh and penetrates below the surface, and cannot be easily removed by scraping with a knife or other sharp instrument without unduly affecting the appearance of the block.

8.2 FOREIGN MATTER

The presence in the sample unit of any matter which has not been derived from fish (excluding packing material), does not pose a threat to human health, and is readily recognized without magnification or is present at a level determined by any method.
including magnification that indicates non-compliance with good manufacturing and sanitation practices.

8.3 PARASITES
The presence of two or more parasites per kg of the sample unit detected by a method described in 7.4 with a capsular diameter greater than 3 mm or a parasite not encapsulated and greater than 10 mm in length.

8.4 BONES (IN PACKS DESIGNATED BONELESS)
More than one bone per kg of product greater or equal to 10 mm in length, or greater or equal to 1 mm in diameter; a bone less than or equal to 5 mm in length, is not considered a defect if its diameter is not more than 2 mm. The foot of a bone (where it has been attached to the vertebra) shall be disregarded if its width is less than or equal to 2 mm, or if it can easily be stripped off with a fingernail.

8.5 ODOUR AND FLAVOUR
A sample unit affected by persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity or of feed.

8.6 FLESH ABNORMALITIES
A sample unit affected by excessive gelatinous condition of the flesh together with greater than 86% moisture found in any individual fillet, or a sample unit with pasty texture resulting from parasitic infestation affecting more than 5% of the sample unit by weight.

9. LOT ACCEPTANCE
A lot shall be considered as meeting the requirements of this standard when: (i) the total number of defective sample units as classified according to Section 8 does not exceed the acceptance number (c) of the sampling plan in Section 7; and (ii) the average net weight of all sample units is not less than the declared weight, provided there is no unreasonable shortage in any container; and (iii) the Food Additives, Hygiene and Labelling requirements of Sections 3.4, 4, 5.1, 5.2 and 6 are met.

CODEX STAN 165-1989 8

ANNEX A: SENSORY AND PHYSICAL EXAMINATION
1. Complete net weight determination, according to defined procedures in Section 7.3 (de-glaze as required).
2. Examine the frozen block for the presence of dehydration by measuring those areas which can only be removed with a knife or other sharp instrument. Measure the total surface area of the sample unit, and calculate the percentage affected.
3. Thaw and individually examine each block in the sample unit for the presence of foreign matter, bone where applicable, odour, and textural defects.
4. In cases where a final decision on odour cannot be made in the thawed uncooked state, a small portion of the disputed material (approximately 200 g) is sectioned from the block and the odour and flavour confirmed without delay by using one of the cooking methods defined in Section 7.8. 5. In cases where a final decision on gelatinous condition cannot be made in the thawed uncooked state, the disputed material is sectioned from the block and the gelatinous condition confirmed by cooking as defined in Section 7.7. or by using
procedure in Section 7.6. to determine if greater than 86% moisture is present in any fillet. If cooking evaluation is inconclusive, then procedure in 7.6 would be used to make the exact determination of moisture content.

CODEX STAN 165-1989

ANNEX B: METHOD FOR THE DETERMINATION OF NET CONTENT OF FROZEN FISH BLOCKS COVERED BY GLAZE

Glazing is not used for Q.F. blocks of white fish. Only Q.F. blocks of herring, mackerel and other brown (fat) fish are glazed, which are destined for further processing (canning, smoking). For such blocks the following procedure may be applicable (tested with block frozen shrimps).

1. PRINCIPLE:
The pre-weighed glazed sample is immersed into a water bath by hand till all glaze is removed (as felt by fingers). As soon as the surface becomes rough, the still frozen sample is removed from the water bath and dried by use of a paper towel before estimating the net product content by repeated weighing. By this procedure thaw drip losses and/or re-freezing of adhering moisture can be avoided.

2. EQUIPMENT:
• Balance - sensitive to 1 g
• Water bath, preferably with adjustable temperature
• Circular sieve with a diameter of 20 cm and 1-3 mm mesh apertures (ISO R 565)
• Paper or cloth towels with smooth surface
• A freezed box should be available at the working place

3. PREPARATION OF SAMPLES AND WATER BATH:
• The product temperature should be adjusted to -18/-20°C to achieve standard deglazing conditions (especially necessary if a standard deglazing period shall be defined in case of regular shaped products).
• After sampling from the low temperature store remove, if present, external ice crystals or snow from the package with the frozen product.
• The water bath shall contain an amount of fresh potable water equal to about 10 times of the declared weight of the product; the temperature should be adjusted on about 15°C to 35°C.

4. DETERMINATION OF GROSS-WEIGHT "A":
After removal of the package, the weight of the glazed product is determined: In case of single fish fillets, single weights are recorded (A 1-A n). The weighed samples are placed intermediately into the freezer box.

5. REMOVAL OF GLAZE:
The pre-weighed samples/sub-samples are transferred into the water bath and kept immersed by hand. The product may be carefully agitated, till no more glaze can be felt by the finger-tips on the surface of the product: change from slippery to rough. Needed time, depending on size/shape and glaze content of the product, 10 to 60 sec. (and more in case of higher glaze contents or if frozen together). For block-frozen products in consumer packs (also for single glaze products, which are frozen together during storage) the following (preliminary) procedure may be applicable: The pre-weighed block or portion is transferred onto a suitable sized sieve and immersed into the water bath. By
slight pressure of the fingers separating deglazed portions are removed fractionally. Short immersing is repeated, if glaze residues are still present.

6. DETERMINATION OF NET WEIGHT "B"
The deglazed sample/sub-sample, after removal of adhering water by use of a towel (without pressure) is immediately weighed. Single net-weights of sub-samples are summed up: B1-n.

CODEX STAN 165-1989 10

1. DETERMINATION OF GLAZE-WEIGHT "C"
C" “weight Glaze " B “weight Net A" " weight Gross = -
2. CALCULATION OF PERCENTAGE PROPORTIONS:
100 x A" " B" " F" " product the of content net % = 100 x A" " C" " G" " product the of weight gross the to related glaze % = - 100 x B" " C" " H" " product the of weight net the to related glaze % = -

UNITED STATES STANDARDS FOR GRADES FISH BLOCKS

264.101 Scope and product description.
a. These U.S. Standards for Grades apply to frozen fish blocks that are rectangular shaped masses made from a single species of fish flesh. They are made from fillets or fillet pieces that are either skin-on and scaled or skinless. Blocks processed from skin-on fish flesh shall be so labeled. The blocks shall not contain minced or comminuted fish flesh. The blocks shall not be made by restructuring (reworking) pieces of fish blocks into the shape of a fish block.
b. These Standards for Grades are implemented in accordance with guidance set forth in part II of NOAA Handbook 25, "Inspector's Instructions for Grading Frozen Fish Blocks."

264.103 Grades.
a. U.S. Grade A fish blocks shall:
   (1) Possess good flavor and odor in accordance with ’ 264.104; and
   (2) Comply with the limits for physical defects for U.S. Grade A quality in accordance with ’ 284.104.
b. U.S. Grade B fish blocks shall
   (1) Possess reasonably good flavor and odor in accordance with ’ 264.104; and
   (2) Comply with the limits for physical defects for U.S. Grade B quality in accordance with ’ 264.104.
c. U.S. Grade C fish blocks shall:
   (1) Possess reasonably good flavor and odor in accordance with ’ 264.104; and
   (2) Comply with the limits for physical defects for U.S. Grade C quality in accordance with ’ 264.104.
(d) Substandard fish blocks shall fail to meet one or more of the requirements given in paragraphs (a), (b), and (c) of this section for U.S. Grades A, B, and C.

264.104 Grade determination.
(a) Procedures for grade determination.
The grade shall be determined by evaluating a product in the frozen, thawed and cooked states according to paragraphs of this section-namely, sampling; flavor and odor; physical defects; listing defect points; and grade assignment.
(b) Evaluation of flavor and odor.
(1) **Good** flavor and odor (essential quality requirements for a U.S. Grade A product) mean that the raw product has the odor and the cooked product has the flavor and odor characteristics of the indicated species of fish and are free from off-flavors and off-odors of any kind.
(2) **Reasonably good** flavor and odor (minimum requirements of a U.S. Grade B and a U.S. Grade C product) mean that the raw product or the cooked product is lacking in good odor (for the raw product) or good flavor and odor (for the cooked product) which is characteristic of the indicated species. Both the raw and the cooked products are free from objectionable off-flavors and off-odors of any kind.
(c) Examination for physical defects.
Each sample unit shall be examined for physical defects using the list of definitions of defects given in paragraph (e) of this section.
(d) Definitions of physical defects
(1) **Dehydration.** This defect refers to loss of moisture from the surface of a fish block during frozen storage. Affected areas have a whitish appearance.
   (i) **Moderate dehydration** masks the surface color of the product and affects more than 5 percent up to and including 15 percent of the surface area. If more than 15 percent of the surface area is affected, each additional 15 percent of surface area affected is another instance. Moderate dehydration can be readily removed by scraping with a blunt instrument.
   (ii) **Excessive dehydration** masks the normal flesh color and penetrates the product. It affects more than 5 percent up to and including 10 percent of the surface area. If more than 10 percent of the surface area is affected, each additional 10 percent of surface area affected is another instance. Excessive dehydration requires a knife or other sharp instrument to remove.
(2) **Uniformity of block size.** This defect refers to the degree of conformity to the declared size. It includes deviations from the standard length, width or thickness. Only one deviation for each dimension shall be counted.
   (i) **Moderate.** A deviation of length and width of 1/8-inch (0.32 cm) or more, up to and including 1/4-inch (0.64 cm). A deviation of thickness of 1/16-inch (0.16 cm) or more, up to and including 1/8- inch (0.32 cm). (ii) **Excessive.** If over 1/4-inch (0.64 cm), each additional 1/8-inch (0.32 cm) of length and width is another...
instance. If over 1/8-inch (0.32 cm), each additional 1/16-inch (0.16 cm) of thickness is another instance. (3) Underweight refers to underweight deviations from the stated weight.

(i) Slight. From 0.1 ounce (2.84 g) up to and including 1.0 ounce (28.35 g).
(ii) Moderate. Over 1.0 ounce (28.35 g) up to and including 4.0 ounces (113.4 g).
(iii) Excessive. If over 4.0 ounces (113.4 g), each additional 1.0 ounce (28.35 g) is another instance.

(4) Angles. An acceptable edge angle is an angle formed by two adjoining surfaces whose apex (deviation from 90 degrees) is within 3/8-inch (0.95 cm) of a carpenter's square placed along its surfaces. An acceptable corner angle is an angle formed by three adjoining surfaces whose apex is within 3/8-inch (0.95 cm) of a carpenter's square.

(5) Improper fill. This defect refers to voids, air packets, ice pockets, ragged edges, bumps, depressions, damage, and embedded packaging material, each of which is greater than inch (0.32 cm) in depth, and which would result in product loss after cutting. It is estimated by determining the minimum number of 1-ounce (28.35 g) model units that could be affected adversely. For the purpose of estimating product loss, the 1-ounce (28.35 g) model unit shall have the dimensions 4 X 1 X 5/8 inch (10.16 X 2.54 X 1.59 cm). The total number of model units that would be affected adversely is the number of instances.

(6) Belly flaps (Napes) may be either loose or attached to a fillet or part of a fillet. The maximum amount of belly flaps should not exceed 15 percent by declared weight of the block if this amount does exceed 15 percent; each additional 5 percent by declared weight is another instance.

(7) Blood spots. Each lump or mass of clotted blood greater than 3/16-inch (0.48 cm) up to and including 3/8-inch (0.95 cm) in any dimension is an instance. If a blood spot is larger than 3/8-inch (0.95 cm), each additional 3/16-inch (0.48 cm) is another instance.

(8) Bruises include distinct, unnatural, dark, reddish, grayish, or brownish off-colors due to diffused blood. Each instance is each bruise larger than 0.5 square inch (3.32 cm²) and less than 1.5 square inch (9.68 cm²). For each bruise 1.5 square inch (9.68 cm²) or larger, each additional complete 1.0 square inch (6.45 cm²) is another instance.

(9) Discoloration refers to deviations from reasonably uniform color characteristics of the species used, such as melanin deposits, yellowing, rusting or other kinds of discoloration of the fish flesh.

(i) Moderate. A noticeable but moderate degree that is greater than 0.5 square inch (3.23 cm²) up to and including 1.5 square inch (9.68 cm²) is one instance. If the discoloration is greater than 1.5 square inch (9.68 cm²), each additional complete 1.0 square inch (6.45 cm²) is another instance.

(ii) Excessive. An excessive degree of discoloration that is greater than 0.5 square inch (3.23 cm²) up to and including 1.5 square inch (9.68 cm²) is one instance.
the discoloration is greater than 1.5 square inch (9.68 cm²) each additional complete 1.0 square inch (6.45 cm²) is another instance.

(10) *Viscera, roe and lace.* Viscera and roe refer to any portion of the internal organs. Each occurrence of viscera and roe is an instance. Lace (frill) is a piece of tissue adhering to the edge of a flatfish (Order *Pleuronectidomnes*) fillet. For each lace, each 1/2-inch (1.27 cm) is each instance.

(11) *Skin.* In skinless fish blocks, each piece of skin larger than 0.5 square inch (3.23 cm²) up to and including 1.0 square inch (6.45 cm²) is an instance. For each piece of skin that is larger than 1.0 square inch (6.45 cm²), each additional complete 0.5 square inch (3.23 cm²) in area is another instance. For pieces of skin smaller than 0.5 square inch (3.23 cm²), the number of 0.5 square-inch (3.23 cm²) squares fully or partially occupied after collecting these pieces on a grid is the number of instances.

(12) *Membrane (black belly lining).* Each piece of membrane (black belly lining) larger than 0.5 square inch (3.23 cm²) up to and including 1.5 square inch (9.68 cm²) is an instance. For pieces of membrane (black belly lining) that are larger than 1.5 square inch (9.68 cm²), each additional complete 0.5 square inch (3.23 cm²) in area is another instance.

(13) *Scales.*

(i) *For skin-on fillets that have been scaled,* an instance is an area of scales over 0.5 square inch (3.23 cm²) up to and including 1.5 square inch (9.68 cm²). If the area is greater than 1.5 square inch (9.68 cm²), each additional complete 1.0 square inch (8.45 cm²) is another instance. Loose scales are counted and instances are deducted in the same manner as for skinless fillets.

(ii) *For skinless fillets,* the first five to ten loose scales is an instance. If there are more than ten loose scales, each additional complete count of five loose scales is another instance.

(14) *Foreign material.* Any harmless material not derived from fish, such as packaging material. Each occurrence is an instance.

(15) *Bones* (including pin bone and fin bone).

(i) Each bone defect to a bone or part of a bone whose maximum profile is 3/16-inch (0.48 cm) or more in length, or at least 1/32-inch (0.08 cm) in shaft diameter or width, or, for bone chips, a longest dimension of at least 3/16-inch (0.48 cm).

(ii) An excessive degree of bone defect is each bone whose maximum profile cannot be fitted into a rectangle, drawn on a flat, solid surface that has a length of 1 3/16-inch (3.02 cm) and a width of 3/8-inch (0.95 cm).

(16) *Fins or part fins.* This defect refers to two or more bones connected by membrane, including internal or external bones, or both, in a cluster.

(i) *Moderate.* Connected by membrane in a cluster, no internal bone.

(ii) *Excessive.* Connected by membrane in a cluster with internal bone.

(17) *Parasites.*

(i) *Metazoan parasites.* Each such parasite or fragment of such a parasite that is detected is an instance.

(ii) *Parasitic copepods.* Each such parasite or a fragment of such a parasite that is detected is an instance.
(18) *Texture* means that the cooked product has the textural characteristics of the indicated species of fish. It does not include any abnormal textural characteristics such as mushy, soft, gelatinous, tough, dry or rubbery.

(i) *Moderate.* Moderately abnormal textural characteristics.

(ii) *Excessive.* Excessively abnormal textural characteristics.

(f) **Listing defect points.** When a sample unit is examined for physical defects using the list of defect definitions given in paragraph (e) of this section, defects are noted and numerical values are assigned in accordance with Table 1. The numbers assigned to defects in Table I are points. For examination in the frozen state and for belly flaps and texture, the defect points are added together. For examination of defects number 7 through 17 in the thawed state, the defect points are added together and this sum is divided by the declared weight of the sample unit in pounds. Express the result to the nearest whole number. Then add the sum of defects points for the frozen state and for belly flaps and texture to the sum of defect points for the thawed state expressed on a per pound basis. This result is used to determine the sample unit grade. The scoring system is based on a perfect score of zero (no physical defects).

(g) **Grade assignment.** Each sample unit will be assigned its grade in accordance with the limits for defects summarized as follows: If a sample unit has been assigned a grade for flavor and odor that is different from the grade indicated by the number of defect points, the sample unit grade will be the lower grade.

264.105 **Tolerances for lot certification.**

(a) The grade assigned to a lot is the grade indicated by the average of the total scores, provided that the number of sample units in the next lower grade for both physical defects and flavor and odor does exceed the acceptance number as indicated in the sampling plans contained in ’264.108 and the provisions of 50 CFR 260.21. In 50 CFR 260.21, the four score points are additive, not subtractive.

(b) The grade assigned to a lot is one grade below the majority of all the sample unit grades if either:

(1) The number of sample units in the next lower grade does exceed the acceptance number as given in the sampling plans contained in ’264.108; or

(2) The grade of any one of the sample units is more than one grade below the majority of all the sample unit grades.

264.106 **Hygiene.** All lots to be assigned a grade shall be processed and maintained in accordance with ’’260.98 through 260.104 of this subchapter and of the good manufacturing practice regulations contained in 21 CFR part 110.

264.107 **Methods of Analysis.** Product samples will be analyzed in accordance with the "Official Methods of Analysis of AOAC International" of the Association of Official Analytical Chemists (AOAC), Sixteenth Edition (1999): Method 976.16 Cooking
US FDA - GOOD MANUFACTURING PRACTICES (GMP)

GMP refers to the Good Manufacturing Practice Regulations promulgated by the US Food and Drug Administration under the authority of the Federal Food, Drug, and Cosmetic Act. These regulations, which have the force of law, require that manufacturer, processors, and package food take proactive steps to ensure that their products are safe, pure, and effective. GMP regulations require a quality approach to manufacturing, enabling companies to minimize or eliminate instances of contamination, mixups, and errors. This in turn, protects the consumer from purchasing a product which is not effective or even dangerous. Failure of firms to comply with GMP regulations can result in very serious consequences including recall, seizure, fines, and jail time.

GMP regulations address issues including recordkeeping, personnel qualifications, sanitation, cleanliness, equipment verification, process validation, and complaint handling. Most GMP requirements are very general and open-ended, allowing each manufacturer to decide individually how to best implement the necessary controls. This provides much flexibility, but also requires that the manufacturer interpret the requirements in a manner which makes sense for each individual business.

GMP is also sometimes referred to as "cGMP". The "c" stands for "current," reminding manufacturers that they must employ technologies and systems which are up-to-date in order to comply with the regulation. Systems and equipment used to prevent contamination, mix-ups, and error.
The 8 Sanitation Points of FDA HACCP

(1) Safety of the water that comes into contact with food or food contact surfaces, or is used in the manufacture of ice;

(2) Condition and cleanliness of food contact surfaces, including utensils, gloves, and outer garments;

(3) Prevention of cross-contamination from insanitary objects to food, food packaging material, and other food contact surfaces, including utensils, gloves, and outer garments, and from raw product to cooked product;

(4) Maintenance of hand washing, hand sanitizing, and toilet facilities;

(5) Protection of food, food packaging material, and food contact surfaces from adulteration with lubricants, fuel, pesticides, cleaning compounds, sanitizing agents, condensate, and other chemical, physical, and biological contaminants;

(6) Proper labeling, storage, and use of toxic compounds;

(7) Control of employee health conditions that could result in the microbiological contamination of food, food packaging materials, and food contact surfaces; and

(8) Exclusion of pests from the food plant.

Source: FDA's Seafood HACCP Rule (in "Fish and Fisheries Products Hazards and Controls Guidance, 3rd Ed.")

Additionally, GMP requires that all manufacturing and testing equipment has been qualified as suitable for use, and that all operational methodologies and procedures (such as manufacturing, cleaning, and analytical testing) utilized in the drug manufacturing process have been validated (according to predetermined specifications), to demonstrate that they can perform their purported function(s).

In the US, the phrase "current good manufacturing practice" appears in 501(B) of the 1938 Food, Drug, and Cosmetic Act (21USC351). US courts may theoretically hold that a drug product is adulterated even if there is no specific regulatory requirement that was violated as long as the process was not performed according to industry standards.

International Agencies Involved with Food Standards
Within the European Union, GMP inspections are performed by National Regulatory Agencies (e.g., GMP inspections are performed in the United Kingdom by the Medicines
and Healthcare products Regulatory Agency (MHRA); in Australia by the Therapeutical Goods Administration (TGA); in South Africa by the Medicines Control Council (MCC); in Brazil by the Agência Nacional de Vigilância Sanitária (National Health Surveillance Agency Brazil) (ANVISA); in Iran, India and Pakistan by the Ministry of Health and by similar national organisations worldwide). Each of the inspectorates carry out routine GMP inspections to ensure that drug products are produced safely and correctly; additionally, many countries perform Pre-Approval Inspections (PAI) for GMP compliance prior to the approval of a new drug for marketing.

Regulatory agencies (including the FDA in the US and regulatory agencies in many European nations) are authorized to conduct unannounced inspections, though some are scheduled. FDA routine domestic inspections are usually unannounced, but must be conducted according to 704(A) of the FD&C Act (21USC374), which requires that they are performed at a "reasonable time." Courts have held that any time the firm is open for business is a reasonable time for an inspection.

**EU Code of Practice**

The Code of Practice for Fish and Fishery Products has been developed by the Codex Committee on Fish and Fishery Products from the merging of the individual codes listed in Appendix XII* plus a section on aquaculture. These codes were primarily of a technological nature offering general advice on the production, storage and handling of fish and fishery products on board fishing vessels and on shore. It also deals with the distribution and retail display of fish and fishery products.

The combined Code of practice has been further modified to incorporate the Hazard Analysis Critical Control Point (HACCP) approach described in the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), Annex: *Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application*. A pre-requisite program is described in the Code covering technological guidelines and the essential requirements of hygiene in the production of fish, shellfish and their products, which are safe for human consumption, and otherwise meets the requirements of the appropriate Codex product standards. The Code also contains guidance on the use of HACCP, which is recommended to ensure the hygienic production of fish and fishery products to meet health and safety requirements.

Within the Code a similar systematic approach has been applied to essential quality, composition and labeling provisions of the appropriate Codex product standards. This is referred to as “Defect Action Point (DAP) Analysis”. However DAP analysis is optional. The Codex Committee on Fish and Fishery Products recommended at its Twentieth Session that defects of a commercial nature, i.e. workmanship defects, which had been removed from Codex fish product standards, be transferred to the appropriate Codex code of practice for optional use between buyers and sellers during commercial transactions. The Committee further recommended that this detail should be described in a section on Final Product Specifications, which now appear as Appendices II - XI. A similar approach to HACCP has been incorporated into the Code as guidelines for the control of defects (DAP Analysis).
The Code will assist all those who are engaged in the handling and production of fish and fishery products, or are concerned with their storage, distribution, export, import and sale in attaining safe and wholesome products which can be sold on national or international markets and meet the requirements of the Codex Standards.

The Code is divided into separate, though interrelated, Sections. It is intended that in order to set up a HACCP or DAP program these should be consulted as appropriate:

(a) Section 2 - Definitions
(b) Section 3 - Pre-requisite Program
(c) Section 4 – General Considerations for the Handling of Fresh Fish, Shellfish and Other Aquatic Invertebrates
(d) Section 5 – Hazard Analysis Critical Control Point (HACCP) and Defect Action Point (DAP) Analysis
(e) Sections 6 and 7 – Aquaculture Production and Live and Raw Bivalve Mollusc Production
(f) Section 8 - Processing of Fresh, Frozen and Minced Fish
(g) Sections 9 to 16 – Processing of Specific Fish and Shellfish Products
(h) Sections 17 to 18 - Transportation and Retail
(i) Appendices
Contact Information Worldwide

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

Iceland
Samhentir Kassagerd
Sudurhraun 4, 210 Gardabær
Phone: 354 5556700
Email: samkassa@mmedia.is

Faroe Islands
P/F Vest Pack
Box 109, FO-350 Vestmanna
Phone: 298 424107
Email: vestpack@post.olivant.fo

Norway
AA&R Cartons AS
Leenvej 1, 1745 Skjeberg
Phone: 40 691 61 500
Email: kjell.hammerstad@ar-carton.com

Thailand
Pressman (Thailand) Co., Ltd
47/9 Moo 9, Soi Nameesathien
Chaengwattana Road, Pakkred, Nonthaburi
11120
Phone: 66 29621151
Email: soren@pressman.co.th

New Zealand
Fishing Industry Services Ltd.
413 Taum Street, Christchurch 1
Phone: 64 33890647
Email: mark@fishindserv.co.nz

China
Qingdao Tianze New Economy
Room 8B, Haijing Building, Binhai Garden
Phone: 86 532-85028986
Email: tianze@qdtianze.com

Vietnam
Van Trading Co., Ltd.
C/O 39 Hai Ba Trung, Dist. 1 Ho Chi Minh City
Phone: 8488246544
Email: vantradingco@hcm.fpt.vn

Peru
M. P. Pack S. A.
Carlos Tenaud 459, Miraflores, Lima
Phone: 51 5 4222706
Email: mppack@amauta.rcp.net.pe

Chile
Pibamour Ltda
Sta. Elena de Huechuraba, Huechuraba
Phone: 56 27400440
Email: carlos.pastene@pibamour.cl

Argentina
Christensen S. R. L.
Chacabuco 314, Buenos Aires 1069
Phone: 54 11 43451531
Email: consultas@christensen.com.ar

Denmark
Beck Pack Systems A/S
Sandemandsvej 6
P.O.Box 135
DK-3700 Rønne
Phone:+45 56 95 25 22 Fax +45 56 95 25 23
Email: Info@Beck-Liner.com

Korea
Korwell Corporation
391-1 Gamchun-dong
Saha-Gu, Pusan
Phone: 82 512001100
Email: kwtrade@Korwell.co.kr

United States
Beck Pack Systems, Inc.
P.O.Box 709
Preston, Washington, USA 98050
Phone: 206 222 9515
Email: Sales@BeckPackSystems.com