

Fresh Fish Wholesale Packaging

Data Sheet No: 1996/03/FT

Introduction

This information sheet describes the main types of fresh fish wholesale packaging and discusses the advantages and disadvantages of each type.

This packaging is used to transport fresh fish (and ice) or smoked fish in single or multi-stage journeys from the processor directly to the retailer or via a wholesale market.

The boxes are required to carry fish and ice in typical unit fish weights of 0.5 kg to 40 kg. The most popular size is the traditional one stone box.

Various packaging materials are employed to suit the needs and preferences of processors, distributors and retailers.

Non-returnable boxes, with drain holes for melt water, have been traditionally employed.

To date, Seafish has recommended the use of expanded polystyrene boxes as they provide the best thermal protection in adverse distribution environments.

Estimated usage of wholesale fresh fish boxes in the UK

Box material	Millions of boxes per year
Expanded polystyrene	14
Corrugated plastic	0.6
Solid fibreboard	5
Corrugated fibre board	0.5

However, developments in integrated transport and distribution systems, with improved temperature control, are resulting in alternative systems of fresh fish packaging replacing the traditional types of boxes.

Prevention of leakage of ice melt water and fish drip has become important in some distribution systems, as contamination of other products being carried in the same system would be disastrous.

New packaging waste legislation will require packaging that can be readily recovered from the waste stream, and sets various targets to recover and recycle waste.

New food safety legislation requires all packages to be correctly labelled.

Packaging Requirements

The choice of fresh fish transport packaging is no longer simple.

The functions of fresh fish packaging are to carry, protect and maintain the quality of the contents from the merchant or processor to the retailer. This requires the packaging to:

- hold adequate ice (if it is used) to cool the fish, and to have sufficient insulation to maintain chill temperatures during transit
- be durable enough to last the journey intact
- be adequately designed and strapped to prevent pilferage
- be capable of accepting indelible marking and labelling
- be cheap enough to be commercially viable
- be easily and cost effectively disposed of or recycled to meet the packaging waste legislation
- and integrate with the handling systems of the processor, merchant, distributor and retailer.

Packaging Types

Expanded Polystyrene Boxes

These boxes are produced from moulded polystyrene beads and they comprise 98% air by volume which makes them light and contributes to their insulation but makes them bulky to store when empty. The lid and box are manufactured in the same manner and are designed to interlock, creating a firm seal. They have very good insulation properties, but relatively poor impact strength. A fold flat polystyrene box is being developed which brings together insulation and volume reduction for storage and transport of the empty boxes.

Solid Fibreboard boxes

These boxes are made from a water resistant board, lined with a low density polyethylene film. They are usually corner glued with water resistant glue. A typical grade of material will contain 85% recycled fibre. Fibre-board boxes have good impact strength but poor insulation. They are available fully erected or as a fold flat box for volume reduction during storage and transport of the empty boxes.

Corrugated Fibreboard Boxes

These boxes are manufactured in a similar manner to the solid fibreboard boxes but are made of a corrugated fibreboard sheet sandwiched between thin layers of coated solid fibreboard. They have very good impact strength but poor insulation.

A new version comprising a coated corrugated box without drainholes but with a pad in the base of the box to absorb melt water is available. These can be delivered flat pack to reduce storage and distribution costs and are manually erected to produce a sealed box.

Corrugated Plastic Boxes

These boxes are made from extruded corrugated plastic (polypropylene) sheet comprising thin skins over a central corrugate to give a total thickness of about 3 mm. The sheets are cut to the desired shapes and the fold lines are made. Boxes are available erected or flat pack for manual erection. The original boxes have poor insulation and strength but an improved type is now available. Produced by a new process the new type has walls of about 7 mm total thickness and has sealed edges to the corrugate.

Returnable Plastic Boxes

These are re-usable plastic (high density polyethylene) containers which can be folded flat for volume reduction during storage or transportation but when assembled make a rigid container. They are available in sizes to carry 5, 10 and 25 kg of fish with ice and they can be re-used 50 times or more. Returnable box systems are already operating on the Continent. The initial box cost is high and a collection and cleaning system is required.

Bulk Modified Atmosphere Packs

Thermoformed plastic pouches are packed with fish, injected with a mixture of gases (usually Nitrogen, Oxygen and Carbon Dioxide) and are heat sealed. The fish are usually placed on an absorbent pad to soak up drip. The bulk MAP envelopes may be placed onto returnable trays which are perforated to allow the free circulation of cool air to the packs, packed onto pallets and are held in refrigerated conditions. A number of fish processors now supply fresh fish to multiple retailers using this system. The retailers break down the packs for display and only have to dispose of the film envelopes.

There is no drip from this type of package and so it integrates with modern handling and distribution systems but the pack has poor insulation properties and so there is need for precisely controlled refrigerated distribution. A combined MAP/ice system can reduce dependence on refrigeration but the melt water must be contained or absorbed.

Other Dry Packaging Systems

These have been developed to cope with the demands of the integrated distribution systems of the multiple retailers. No drip is permitted but effective refrigeration systems are in place. Usually the fish and ice are either placed directly onto an absorbent pad in a sealed non-returnable box, or are placed on a corrugated plastic platform over an absorbent pad which is then all sealed in a polythene bag which is in turn placed in a sealed non-returnable box. A sealed returnable plastic box is also available. These systems are more expensive than the traditional methods.

Disposal and Recycling Considerations

It is technically, although not necessarily financially, viable for all packaging materials used in the fish industry to be recycled. The collection, sorting and transport to a recycling depot for all this packaging waste is likely to be expensive unless there is a large concentration of one material type in one location. Efficient compaction is important in order to reduce transport costs and waste disposal charges as they are often based on volume rather than weight of material. Fibreboard and corrugated plastic can be easily compacted in standard waste compaction equipment and are readily recycled, whereas expanded polystyrene requires specialist compaction equipment and the contaminated polystyrene material is difficult to recycle.

Conclusions

There is no box that is ideally suited to all possible circumstances of fish distribution. The different characteristics of each box make them suitable for a particular usage, user and market. In choosing a suitable box, the factors such as box insulation, strength, cost and whether fluid loss in the distribution system is allowed have to be considered. However, the cost of disposal, whether simply collection for landfill or for recycling, is likely to play a major role in this decision.

Where environmental temperature control in distribution cannot be depended upon, the use of expanded polystyrene boxes and ice must remain the recommendation in order to achieve the best fish quality. However, this will lead to waste disposal problems and costs.

Where refrigerated distribution is introduced and there is less dependence on the insulation of the boxes, then the more readily stored and disposed of fibreboard and corrugated plastic boxes can be recommended.

For the modern 'dry' integrated distribution systems the choices are more complex depending on market requirements. The collection or absorption of ice melt water and drip adds complexity and

cost. 'Ice free' modified atmosphere packaging is highly dependent on precise refrigerated temperature control in order to maintain fish quality.

In environmentally sensitive countries such as Germany and Denmark, returnable box systems have been introduced.

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