EPS Packaging: Serving the Cold Chain

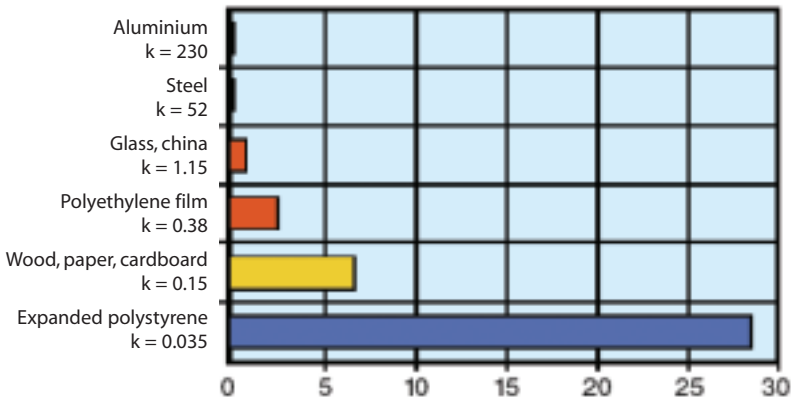
PACKAGING that provides reliable insulation is necessary for products where:

- An increase in temperature would be detrimental to their quality or safety — and there is no guarantee of maintaining a stable temperature because the product is being transported. This applies to fresh meat and fish and ice cream.

- A product must be protected from thermal shock (i.e. sudden changes in temperature) in transit or storage. This applies to some pharmaceutical products, fresh fruit and vegetables, some wines, some seafood and live crustaceans.

Figure 1

Insulating property expressed as thermal conductivity (k) in values of W/mK



Why is EPS packaging the No. 1 choice for food industry and health professionals?

EPS (expanded polystyrene) has a very low rate of thermal conductivity that can help producers to meet strict regulatory requirements, as well as their own quality and safety criteria.

Figure 1 (left) shows that the insulating performance of EPS is very high compared to conventional packaging materials. This illustrates that EPS is the ideal material to use for any packaging where thermal insulation is important.

The insulating properties of EPS can be used to ensure that a product is kept at an even temperature that is below that of its surroundings. It can also help to protect against sudden temperature changes, for example when products are removed from a cold room or a refrigerated truck.

The two graphs below show how an EPS box maintains a product at a low temperature over time compared to a non-insulating packaging material.

Figure 2a

Packaging with low insulating property

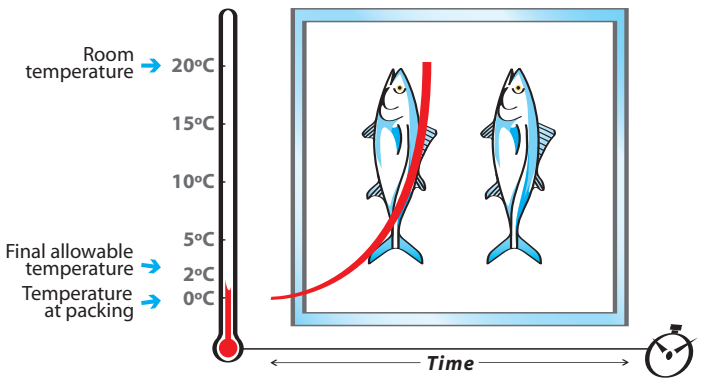
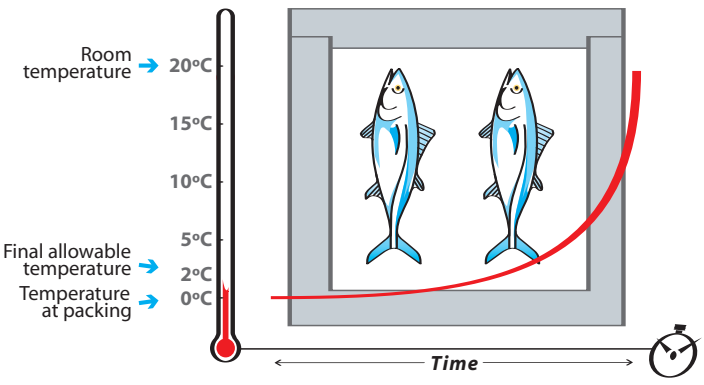


Figure 2b

Expanded polystyrene packaging



Temperature of the packaged product

Maintaining Temperature Stability

It is well known that, particularly during warm periods, food can be exposed to several unexpected rises in temperature — thus reducing the reliability of its use-by date.

Factors that impact on the temperature stability of fresh food include loading and unloading operations, transfer of product to storage facilities, from storage to the logistic centre and from there to the point of sale. Lastly, there is the time spent in the shopper's trolley and shopping bag before finally making it to a domestic refrigerator…

Other parameters of uncertainty that come into play are the reliability of the refrigeration equipment in the storage areas, in the transport vehicles and in the cabinets at the point of sale.

The essential properties of EPS that can counteract these uncertainties are:

- **insulating** packaging which ensures optimal temperature conditions
- **inert** packaging which does not contribute to bacterial development
- **protective** packaging which helps prevent mechanical deterioration of superficial tissues.

The Food Safety (Fisheries Products & Live Shellfish) (Hygiene) Regulations 1998

Some extracts from the regulations about fish transportation and handling where EPS can contribute to food safety are:

Packaging materials and products liable to enter into contact with fishery products must comply with all the rules of hygiene, and in particular:

- they must not be such as to impair the organoleptic characteristics of the fishery product
- they must not be capable of transmitting to the fishery products substances harmful to human health
- they must be strong enough to protect the fishery products adequately.

Fishery products must, during storage and transport, be kept at the temperatures laid down in these Regulations, and in particular:

- fresh or thawed fishery products and cooked and chilled crustacean and molluscan shellfish products must be kept at a temperature approaching that of melting ice
- frozen fishery products, with the exception of frozen fish in brine intended for the manufacture of canned foods, must be kept at an even temperature of -18°C or less in all parts of the product, after temperature stabilisation, and allowing for the possibility of brief upward fluctuations of not more than 3°C, during transport.

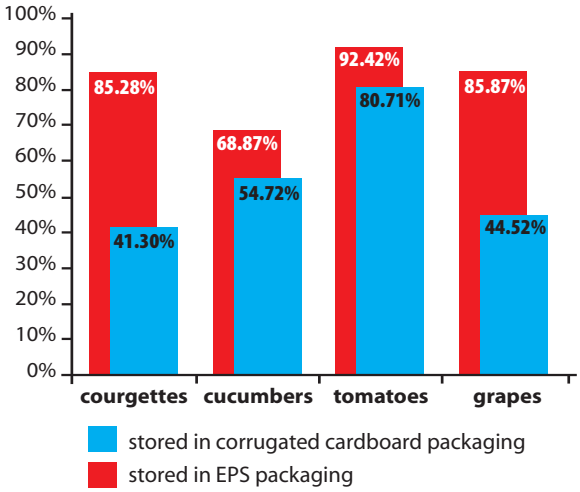
Conditions for fresh products

Containers used for the dispatch or storage of fresh fishery products must be designed in such a way as to ensure both their protection from contamination and their preservation under sufficiently hygienic conditions and, more particularly, they must provide adequate drainage of melt water.

Study Showing EPS helps retain nutrients

Work carried out in 1997 by Dr. Hyung Woo Park at the Korean Food Research Institute, shows that EPS packaging is the most efficient material for storing fruit and vegetables. The outcome of the study over one week shows that EPS protects against content weight loss and preserves nutrients.

Percentage of remaining vitamin C after one week of storage



Conclusion

EPS packaging, with its outstanding thermal and protective properties, offers a reliable and cost effective packaging option for fish producers. To guarantee the quality and safety of your products when they arrive at a customers' home — choose EPS.