

## Glazing

During frozen or cold storage, frozen seafood products can develop surface drying or dehydration. Excessive drying leads to 'freezer burn'. To prevent this happening seafood products are typically glazed during frozen storage.

Glazing is the term used to describe applying a protective coating of ice (ice glaze) to frozen seafood products. The ice layer excludes air from the surface of the product, reducing the rate of oxidation.

### Glazing methods

Glazing is usually carried out by dipping or spraying frozen seafood products with potable water. Regardless of the method used, the amount of glaze picked up by the product depends on the product temperature, the temperature of the water, the size and shape of the product, its surface area and the glazing time.

The application of glaze can be difficult to control. If it is applied in an uncontrolled way the amount of glaze added will not be constant and the thickness will not be uniform. This will affect the amount of protection offered by the glaze.

	Method	Advantages	Disadvantages
Dipping	Placing the frozen product in a tank of water for a period of time.	Cost-effective. Low capital costs. Relatively simple.	Inconsistent glaze coverage. Uncontrolled. Seafood can be left too long or 'soaking'. May need repeat applications.
Spraying	Typically involves purpose designed equipment to spray water over a product.	Controlled. Consistent glaze coverage.	Capital costs.
Packaging only	Involves packing the seafood in plastic packaging (e.g. film or bags) or vacuum packing.	Can be simple. Semi-controlled.	Can be difficult to exclude oxygen from non vacuum packs. May only suitable for short storage periods. Packaging costs.

## Glaze levels

In industry, glaze is typically applied from 4-10% depending on the product. In extreme cases it has been known to have up to 25% glaze for some products. Some companies prefer only to rely on packaging itself to protect product during storage. This is usually only for product that is held for short periods in frozen storage.

## Some problems associated with glazing

Problem	Cause
Glaze is brittle and easily dislodged during handling.	If the product surface temperature is at $-70^{\circ}\text{C}$ or less, the glaze is fractured and broken due to the thermal stress during formation of the ice. Product temperature is thus too low.
Glaze is soft and easily dislodged during handling.	If the product is immersed in glaze water for too long, a thick glaze is formed but the temperature difference between the fish and ice is high and only slightly below $0^{\circ}\text{C}$ . This prevents the glaze from forming properly.
Despite being glazed, product surface dehydrates during frozen storage.	The glaze has been applied unevenly or incorrectly. Review glazing method used and improve. Consider whether glazed product requires additional protection i.e. packaging during storage. Check the temperature of the cold store to eliminate fluctuations.

## Labelling requirements (pre-packs)

There is no maximum of glaze allowed. The weight of product should be given gross and net of glaze. Care should be taken when deciding the amount of glaze to use (i.e. is it reasonable for preserving quality) so as not to mislead the customer or consumer.

## Determination of weight of glaze

There is no official method for the determination of glaze weight but Codex provides the following:

Weigh the frozen seafood products (excluding packaging) to determine gross weight (GW).

Allow the product temperature to reach  $-18$  to  $-20^{\circ}\text{C}$ . As soon as the seafood is removed from frozen storage, remove from any packaging and place under a gentle spray of water or in a water bath (water temperature  $15^{\circ}\text{C}$  to  $35^{\circ}\text{C}$ ) until all the ice glaze that can be seen or felt is removed. This may take up to a minute depending on size/shape. Remove adhering water by the use of paper towel and weigh the product to determine net weight (NW).

To determine the weight of glaze (G), use the following:

GW – NW = glaze weight (G)

To calculate this in percentage terms:

- % net content of the product =  $(NW / GW) \times 100$
- % glaze related to the gross weight of the product =  $(G / GW) \times 100$
- % glaze related to the net weight of the product =  $(G / NW) \times 100$

### References

KJ Whittle & P Howgate, Glossary of Fish Technology Terms, FAO, February 2002

Sea Fish Industry Authority, Seafood Labelling Guidance, March 2008

Codex Alimentarius, Standard for quick frozen blocks of fish fillet, minced fish flesh and mixtures of fillets and minced fish flesh, Standard 165-198 (rev.1 1995)

### Further information from Seafish

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