

OPTIM  ICE

**Super  
chilling  
fish since  
1999**

**OptimIce  
your  
catch!**

Liquid  
ice  
machines



**KAPP** ehf  
THE OPTIM  ICE COMPANY

# Super chilling fish since 1999



## THIS IS WHAT WE DO!

### Manufacturing, sales and service of:

- Optim-Ice Liquid Ice Systems
- Liquid Ice Storage Tanks
- Horizontal and Vertical Plate Freezers
- RSW Systems
- Industrial Refrigeration Equipment
- Vacuum Pumps
- Other Processing Equipment
- Installation and Service

**The Optim-Ice® can be up to 40% thick!**



**Ólafur Rögnvaldsson**  
CEO Hraðfrystihúss Hellissands

*"The Optim-Ice equipment has proved to be Excellent for our fishing vessels and our production factory on land. I recommend Optim-Ice for anyone handling fish".*



**Pétur H. Pálsson**  
Director of Vísir fishing company

*"We have used the Optim-Ice equipment in our fishing vessels for many years. Our experience has been outstanding. It gives us without a doubt better quality, longer shelf life, reduced labor hours and better price for our products".*



## Onboard handling

# WHERE THE COOL CHAIN NEVER BREAKS



## In the plant



## In Transit

### FACTS

- The liquid ice completely enwraps the product.
- Increased shelf life by 5-7 days.
- Decreases micro bacteria formation.
- Significantly faster down time.
- Rapid and efficient cooling.

### AFTER 14 DAYS IN ICE

Two fish are shown side-by-side. The top fish is labeled 'OPTIM ICE' and the bottom fish is labeled 'FLAKE ICE'. Both fish appear fresh and similar in appearance.





Örvar SH 777



Swell Rider

# Over 300 vessels use



Gollenes M-31-HO



Guðmundur í Nesi RE 13



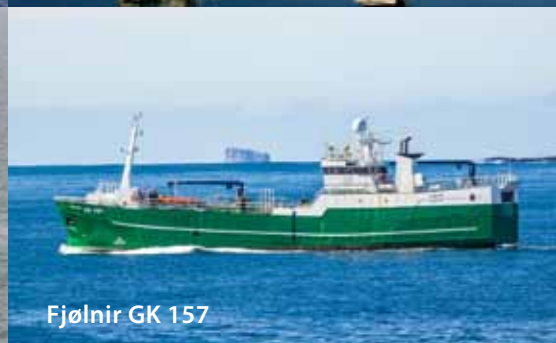
Markus GR 6-373



Mette Helene RI 427



Quo Valdis R-50-K



Fjølñir GK 157



Rífsnes SH 44



Bolga N-10-ME



Vestmannaey VE 444



Skálaberg RE 7



Brimnes RE 27



Óli Gísla GK-112

# OPTIM ICE

## Optimice your catch!

### HELP US TO HELP YOU

#### What we need to know about your process;

- Off or onshore application.
- Volume of product per hour.
- Highest temperature of the product.
- What is your target product temperature.
- Highest water temperature (used for ice production).
- A brief description of your manufacturing process will help.
- Electrical information.

#### Please email your information to;

**North America:** sales@kappusa.com

**All other countries:** kapp@kapp.is

### OPTIM-ICE SYSTEM ACRONYMS DETAILS:

- BP** = Standard version with Intergraded pre-cooler  
**P** = Intergraded pre-cooler  
**T** = For warmer weather climates  
**R** = Using existing pump circulation system  
**S** = Air cooled  
**H** = Hydraulic driven  
**B** = Standard version without Intergraded pre-cooler

### BP - 120

#### Variable production range:

Output can be varied from 243 Gallon/h with 40% ice concentration to 584 Gallon/h with 10% ice concentration.

#### Refrigeration capacity:

65.0 kW/14.095 Btu's/h or 338.124 Btu's/h per 24 hours.



### BP - 130

#### Variable production range:

Output can be varied from 365 Gallon/h with 40% ice concentration to 811 Gallon/h with 10% ice concentration.

#### Refrigeration capacity:

90.0 kW/19.516 Btu's/h or 468.230 Btu's/h per 24 hours.



### BP - 140

#### Variable production range:

Output can be varied from 470 Gallon/h with 40% ice concentration to 964 Gallon/h with 10% ice concentration.

#### Refrigeration capacity:

107.0 kW/23.197 Btu's/h or 556.732 Btu's/h per 24 hours.



### Storage Tank

Tanks are dual shell manufactured from plastic with air insulation. All tanks are manufactured to meet the most stringent requirements for food production.

#### Available sizes:

264, 528, 793 and 1.057 Gallon.



### BP - 105

#### Variable production range:

Output can be varied from 61 Gallon/h with 40% ice concentration to 129 Gallon/h with 10% ice concentration.

#### Refrigeration capacity:

14.5 kW/3.144 Btu's/h or 75.391 Btu's/h per 24 hours.



### BP - 110

#### Variable production range:

Output can be varied from 122 Gallon/h with 40% ice concentration to 282 Gallon/h with 10% ice concentration.

#### Refrigeration capacity:

33.0 kW/7.161 Btu's/h or 171.710 Btu's/h per 24 hours







## Storage Tanks

### Technical Specification:

Tanks are dual shell manufactured from plastic with air insulation.

All tanks are manufactured to meet the most stringent requirements for food production.

The Tanks are designed to maintain a homogenous ice mixture.

This is achieved by continually stirring the mixture. The use of storage tanks makes it possible to deliver large quantities of

Optim-Ice® when needed and in a short period of time.

Each tank is fitted with a pump capable of delivering up to 1.057 Gallon of Optim-Ice® per hour. A pressure switch automatically starts and stops the pumping operation by sensing the pressure at the outlet nozzle.

Each tank is fitted with a sensor that senses the quantity of Optim-Ice® in the tank.

The sensing mechanism automatically starts and stops the liquid ice system according to the customer requirements.

### Power Consumption:

Total 2.6 kW (Pump 1.5 kW and Stirring Mechanism 1.1 kW).

### Storage Tanks are available in four standard sizes:

Dimensions in ins, weight in Lbs:

	<b>L x W x H</b>	<b>Lbs.</b>
264 G	63 x 54 x 59	1,036
528 G	90 x 54 x 59	1,146
793 G	125 x 54 x 59	1,411
1,057 G	160 x 54 x 59	1,543



## Pre-Coolers

### Technical Specification:

Pre-Coolers are used to obtain optimal utilization of the Optim-Ice® System in varying circumstances.

The Pre-Cooler is adjusted and calibrated to suit each customer and his particular requirements. The selection of the correct Pre-Cooler is dependant on the size of the liquid ice system being used and water temperature.

The use of a Pre-Cooler allows the customer to optimize the efficiency of the liquid ice system at both different levels of flow and water temperature.

**Refrigerant:** R-404A /R-449A

### Pre-Coolers are available in the following sizes:

#### Pre-Cooler FK-50

**Production capacity:**

50.0 kW/10.842 Btu's/h.

**Production range:**

793 Gallon per hour down cooling from 59°F to 32°F.  
1,585 Gallon per hour down cooling from 45°F to 32°F.

**Power consumption:**

15.0 kW.

**Dimensions in ins:**

(LxWxH): 54 x 26 x 55.

**Weight:**

959 lbs.

**Condenser cooling:**

41°F = 766 Gallons/h.  
50°F = 1,004 Gallons/h.

**Water requirements:**

59°F = 1,242 Gallons/h.  
68°F = 2,536 Gallons/h.

#### Pre-Cooler FK-100

**Production capacity:**

100.0 kW/21,684 Btu's/h.

**Production range:**

1,585 Gallon per hour down cooling from 59°F to 32°F.  
4,491 Gallon per hour down cooling from 41°F to 32°F.

**Power consumption:**

28.0 kW.

**Dimensions in ins:**

(LxWxH): 65 x 31 x 67.

**Weight:**

1,907 lbs.

**Condenser cooling:**

41°F = 1,374 Gallons/h.  
50°F = 1,480 Gallons/h.

**Water requirements:**

59°F = 2,272 Gallons/h.  
68°F = 3,963 Gallons/h.



## Liquid Ice System BP - 105

### Technical Specification:

#### Refrigeration Capacity:

14.5 kW/3,144 Btu's/h or 75,391 Btu's per 24 hours\*.

#### Pre-Cooler:

Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

#### Variable production range:

Output can be varied from 61 Gallon/h with 40% ice concentration to 129 Gallon/h with 10% ice concentration\*\*.

#### Filtration:

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 7.0 kW

**Dimensions in ins (LxWxH):** 57 x 23 x 34

**Weight:** 820 lbs

**Refrigerant:** R-404A /R-449A

#### Condenser: Cooling water requirements:

40°F = 238 Gallons/h

50°F = 291 Gallons/h

60°F = 423 Gallons/h

70°F = 634 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +59°F.

## Liquid Ice System BPH - 105

### Technical Specification:

**Refrigeration Capacity:** 14.5 kW/3,144 Btu's/h or 75,391 Btu's per 24 hours\*.

**Pre-Cooler:** Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

**Variable production range:** Output can be varied from 61 Gallon/h with 40% ice concentration to 129 Gallon/h with 10% ice concentration\*\*.

**Filtration:** A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

#### Power Consumption:

Hydraulic: Flow 12 gpm at 2610 psi. Electrical: 230V/60Hz/350W

**Dimensions in ins (LxWxH):** 57 x 23 x 34

**Weight:** 606 lbs

**Refrigerant:** R-404A /R-449A

#### Condenser: Cooling water requirements:

40°F = 238 Gallons/h

50°F = 291 Gallons/h

60°F = 423 Gallons/h

70°F = 634 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +59°F.



## Liquid Ice System B - 110

### Technical Specification:

**Refrigeration Capacity:**

20.0 kW/4,337 Btu's/h or 103,883 Btu's per 24 hours\*.

**Variable production range:**

Output can be varied from 122 Gallon/h with 40% ice concentration to 417 Gallon/h with 10% ice concentration\*\*.

**Filtration:**

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 12.0 kW

**Dimensions in ins (LxWxH):** 49 x 45 x 68

**Weight:** 1,168 lbs

**Refrigerant:** R-404A /R-449A

**Pre-Cooler:**

Optional pre-cooler ensures uniform production of Optim-Ice® over a large inlet water temperatures range.



## Liquid Ice System BP - 110

### Technical Specification:

**Refrigeration Capacity:**

33.0 kW/7,161 Btu's/h or 171,710 Btu's per 24 hours\*.

**Pre-Cooler:** Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

**Variable production range:**

Output can be varied from 122 Gallon/h with 40% ice concentration to 296 Gallon/h with 10% ice concentration\*\*.

**Filtration:** A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 17.0 kW

**Dimensions in ins (LxWxH):** 49 x 45 x 68

**Weight:** 1,367 lbs

**Refrigerant:** R-404A /R-449A

**Condenser:** Cooling water requirements:

40°F = 343 Gallons/h

50°F = 449 Gallons/h

60°F = 634 Gallons/h

70°F = 925 Gallons/h

**Condenser:** Cooling water requirements:

40°F = 528 Gallons/h

50°F = 661 Gallons/h

60°F = 951 Gallons/h

70°F = 2,087 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +32°F.

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +59°F.





## Liquid Ice System BPS - 110

### Technical Specification:

#### Refrigeration Capacity:

33.0 kW/7,161 Btu's/h or 171,710 Btu's per 24 hours\*.

#### Pre-Cooler:

Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

#### Variable production range:

Output can be varied from 122 Gallon/h with 40% ice concentration to 296 Gallon/h with 10% ice concentration\*\*.

#### Filtration:

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 28.0 kW

**Dimensions in ins (LxWxH):** 98 x 45 x 106

**Weight:** 1,830 lbs

**Refrigerant:** R-404A /R-449A

#### Condenser: Cooling water requirements:

40°F = 528 Gallons/h

50°F = 661 Gallons/h

60°F = 951 Gallons/h

70°F = 2,087 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +32°F.



## Liquid Ice System B - 120

### Technical Specification:

#### Refrigeration Capacity:

40.0 kW/8,674 Btu's/h or 208,018 Btu's per 24 hours\*.

#### Variable production range:

Output can be varied from 243 Gallon/h with 40% ice concentration to 835 Gallon/h with 10% ice concentration\*\*.

#### Filtration:

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 24.0 kW

**Dimensions in ins (LxWxH):** 65 x 54 x 68

**Weight:** 2,293 lbs

**Refrigerant:** R-404A /R-449A

#### Pre-Cooler:

Optional pre-cooler ensures uniform production of Optim-Ice® over a large inlet water temperatures range.

#### Condenser: Cooling water requirements:

40°F = 687 Gallons/h

50°F = 872 Gallons/h

60°F = 1,242 Gallons/h

70°F = 2,748 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +32°F.



## Liquid Ice System BP - 120

**Technical Specification:**

**Refrigeration Capacity:**  
60.0 kW/14,095 Btu's/h or 338,124 Btu's per 24 hours\*.

**Pre-Cooler:** Optional pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

**Variable production range:**  
Output can be varied from 243 Gallon/h with 40% ice concentration to 584 Gallon/h with 10% ice concentration\*\*.

**Filtration:**  
A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**  
System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 30.0 kW

**Dimensions in ins (LxWxH):** 65 x 54 x 68

**Weight:** 2,425 lbs

**Refrigerant:** R-404A /R-449A

**Condenser:** Cooling water requirements:

40°F	=	951 Gallons/h
50°F	=	1,162 Gallons/h
60°F	=	1,585 Gallons/h
70°F	=	3,091 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.  
\*\*Based on seawater inlet temperature of +59°F.

## Liquid Ice System B - 130

**Technical Specification:**

**Refrigeration Capacity:**  
60.0 kW/13,011 Btu's/h or 312,153 Btu's per 24 hours\*.

**Variable production range:**  
Output can be varied from 365 Gallon/h with 40% ice concentration to 1,252 Gallon/h with 10% ice concentration\*\*.

**Filtration:**  
A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**  
System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 33.0 kW

**Dimensions in ins (LxWxH):** 89 x 54 x 68

**Weight:** 2,822 lbs

**Refrigerant:** R-404A /R-449A

**Pre-Cooler:**  
Optional pre-cooler ensures uniform production of Optim-Ice® over a large inlet water temperatures range.

**Condenser:** Cooling water requirements:

40°F	=	951 Gallons/h
50°F	=	1,162 Gallons/h
60°F	=	1,585 Gallons/h
70°F	=	3,091 Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.  
\*\*Based on seawater inlet temperature of +32°F.



## Liquid Ice System BP - 130

### Technical Specification:

**Refrigeration Capacity:** 90.0 kW/19,516 Btu's/h or 468,230 Btu's per 24 hours\*.

#### Pre-Cooler:

Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

#### Variable production range:

Output can be varied from 365 Gallon/h with 40% ice concentration to 811 Gallon/h with 10% ice concentration\*\*.

**Filtration:** A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 45.0 kW

**Dimensions in ins (LxWxH):** 89 x 54 x 68

**Weight:** 3,461 lbs

**Refrigerant:** R-404A /R-449A

**Condenser:** Cooling water requirements:

40°F	=	1,453	Gallons/h
50°F	=	1,849	Gallons/h
60°F	=	2,880	Gallons/h
70°F	=	7,266	Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +59°F.

## Liquid Ice System BR - 130 rack system

### Technical Specification:

#### Refrigeration Capacity:

80.0 kW/17,347 Btu's/h or 416,288 Btu's per 24 hours\*.

#### Variable production range:

Output can be varied from 489 Gallon/h with 43% ice concentration to 1,664 Gallon/h with 10% ice concentration\*\*.

#### Filtration:

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

#### Minimum salt concentration:

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 7.5 kW

**Dimensions in ins (LxWxH):** 89 x 40 x 63

**Weight:** 1,587 lbs

#### Refrigeration system:

To be connected to pump circulation at -8.0°F.

**Refrigerant:** R-717/R-404A/R-507/R-449A

#### Pre-Cooler:

Optional pre-cooler ensures uniform production of Optim-Ice® over a large inlet water temperatures range.

**Condenser:** Cooling water requirements:

40°F	=	1,453	Gallons/h
50°F	=	1,849	Gallons/h
60°F	=	2,880	Gallons/h
70°F	=	7,266	Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +32°F.





## Liquid Ice System B - 140

### Technical Specification:

**Refrigeration Capacity:**

80.0 kW/17,347 Btu's/h or 416,288 Btu's per 24 hours\*.

**Variable production range:**

Output can be varied from 487 Gallon/h with 40% ice concentration to 1,670 Gallon/h with 10% ice concentration\*\*.

**Filtration:**

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 40.0 kW

**Dimensions in ins (LxWxH):** 113 x 54 x 68

**Weight:** 3,968 lbs

**Refrigerant:** R-404A /R-449A

**Pre-Cooler:**

Optional pre-cooler ensures uniform production of Optim-Ice® over a large inlet water temperatures range.

**Condenser:** Cooling water requirements:

40°F	=	1,374	Gallons/h
50°F	=	1,823	Gallons/h
60°F	=	2,510	Gallons/h
70°F	=	5,284	Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +32°F.



## Liquid Ice System BP - 140

### Technical Specification:

**Refrigeration Capacity:**

107.0 kW/23,202 Btu's/h or 556,732 Btu's per 24 hours\*.

**Pre-Cooler:**

Integrated pre-cooler ensures uniform production of Optim-Ice® in water temperatures up to +59°F.

**Variable production range:**

Output can be varied from 470 Gallon/h with 40% ice concentration to 964 Gallon/h with 10% ice concentration\*\*.

**Filtration:**

A 5-micron filter fitted to water intake to prevent ingestion of foreign objects.

**Minimum salt concentration:**

System requires 3% NaCl concentration for Optim-Ice® production.

**Power Consumption:** 52.0 kW

**Dimensions in ins (LxWxH):** 113 x 54 x 68

**Weight:** 4,431 lbs

**Refrigerant:** R-404A /R-449A

**Condenser:** Cooling water requirements:

40°F	=	1,506	Gallons/h
50°F	=	1,929	Gallons/h
60°F	=	2,616	Gallons/h
70°F	=	4,676	Gallons/h

\*Appr. 4 Btu is required to achieve a one-degree temperature reduction in one kilogram of fish.

\*\*Based on seawater inlet temperature of +59°F.

*When it comes to preserving quality and freshness of the catch, it is a known fact that proper handling, rapid and efficient cooling is essential. The consumer demands for both quality and freshness are ever increasing. Producers must meet the demands of the market with any legitimate means available to them. The key to maintaining freshness and quality of the catch is initial rapid rate of cooling. This hinders the growth of bacteria and microorganism.*

### **Here is what one of our customers have to say about Optim-Ice®**

*"...Then there is an enormous work savings involved by the fact that we have liquid ice system on board. - ...then it is clear that we are getting much higher prices for the fish than we were getting before, that I thank better quality..."*

**Jónas S. Jóhannsson, captain Geir PH-150**

## **Liquid ice system**

Optim-Ice® is one of the best cooling medium on the market that delivers rapid rate of cooling and at the same time does not bruise or damage the catch.

The cooling medium is viscous, consisting of microscopic ice crystals. This allows the medium to flow and completely enwrap the catch to bring about extremely rapid transfer of energy. This in turn hinders bacterial growth and ensures maximum quality of the catch.

These unique properties of Optim-Ice® make it possible to store the catch in drained containers making sure that the catch does not lay in a liquid bath. When Optim-Ice® is applied it flows freely completely surrounding the entire catch. Excess liquid is drained away leaving uniformly distributed ice.

Optim-Ice® is produced directly from seawater. Presently there are many types of Optim-Ice® systems available to meet your cooling needs.

Optim-Ice® systems have been installed in numerous vessels both in Iceland and around the world. Our customers have found the Optim-Ice® system to be both reliable and efficient.



## **Rapid cooling of Salmon**

**It is important to cool the fish rapidly to ensure the optimal quality, bleeding and shelf life.**

Optim-Ice® has been used for rapid cooling of salmon in Norway, Scotland and the Faroe Islands. The applications differ, but have all the same benefits of cooling the salmon quickly and economically down to the right temperature for processing.

There have been basically 2 methods used; in tanks chilling live and bled salmon. Chilling the salmon live in large tanks is done in a plant in the Faroe Islands. In this plant the fish are pumped from a wellboat into a 100 ton tank, where they are chilled down for

30 minutes. When leaving the tank they are killed and enter a bleeding tank for 10 minutes, followed by a washing tank for 20 minutes. Each tank is chilled by Optim-Ice® and the control system for these tanks is supplied by Optimar Iceland Inc. The

temperature in each tank is monitored and the ice is produced according to the target temperature chosen for the tanks.

At a processing plant in the Shetland Islands Optim-Ice® is added to a large chilling tank to

chill the fish before gutting and packaging. Optim-Ice® is produced into the tank overnight and is added during the day.

Tests have been carried out using Optim-Ice® to cool salmon in transportation from sea-

sites to processing, and from primary processing to secondary processing. The need for cooling can be calculated, based on the temperature on site and the target temperature at arrival, using the optimal amount of Optim-Ice®.



## Rapid cooling of Whitefish

**It is important to cool the fish rapidly in the first hours after it is caught, as this can lengthen the shelf-life dramatically.**

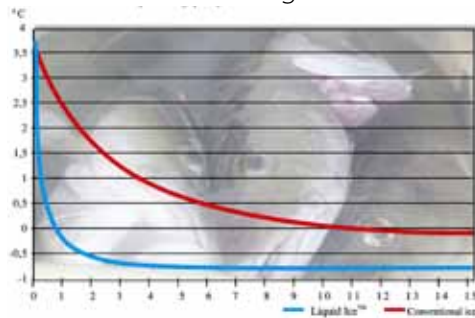
Optim-Ice® has been used extensively in cooling and storing whitefish for many years. Optim-Ice® has been used to cool/chill the fish in tanks (bleeding and washing) or directly in bins and boxes aboard vessels. These methods have given very good results and have given fresh fish that has prolonged storage compared to flake ice.

The following method is used when using bins and boxes for storage:

A thin layer of Optim-Ice® is put in the bottom of the box/bin. A layer of fish is laid into the bin and covered with Optim-Ice®, this is repeated until the bin is filled up.

As the holes in the bins are open the seawater drips from the ice and through the holes/plugs in the bins, leaving a snow-like ice covering the fish.

The fine texture of this ice ensures less marking on the fish compared to flake ice, a rapid cooling of the fish in the beginning and a constant cold area surrounding the fish.



**Rapid rate of cooling is essential**  
When it comes to preserving quality and freshness



*Haddock after 7 days storage in 460L bins.*



*Haddock after 7 days in Optim-Ice.*



*Cod after 14 days. Optim-Ice® above - flake ice beneath.*



## Rapid cooling of shrimp

**It is important to cool the fish rapidly in the first hours after it is caught, as this can lengthen the shelf-life dramatically.**

**Optim-Ice® in shrimp, lobster and crabs.**

One of the most important benefits

of using Optim-Ice® while catching lobster is the distinctive difference in color.

Lobster caught and chilled in Optim-Ice® preserve their red color dramatically better than using



conventional ice or chilled water. When the lobster enters the Optim-Ice® solution it is chilled down rapidly. The lobster is known to stay alive and slowly clean all mud and residue from it's gills and organs. Keeping a lobster at this stage helps preserve the color of the shell and gives a better overall look of the product. This is visual when comparing the color of lobster handled in Optim-Ice® and conventional methods.

### Snow crab

Studies performed by the Canadian Centre for Fisheries Innovation (CCFI) show that Optim-Ice® does perform better than regular icing methods when icing Snow Crab. Optim-Ice® increased the LO50 time from 38 to 75 hours in this experiment (LO50 is the time until 50% of the crab are dead). Optim-Ice® maintained more lively crab longer than did normal icing practices under these conditions.



## Rapid cooling of pelagic

**It is important to cool the fish rapidly in the first hours after it is caught, to ensure the optimal quality and highest prices at harbour.**

Optim-Ice® has given good results in rapid cooling of herring at sea and in processing mackrel on shore. This has been done by using Optim-Ice® alone or together with RSW systems.

### On board Pelagic vessels

The rapid cooling is obtained by systematically using Optim-Ice® in the hold of a ship, using the Optim-Ice® as a buffer that cools the fish as it is pumped on board the ship. The results have been very good giving a high quality catch when the ship arrives at harbor.

### The major benefits are:

- Rapid cooling of the catch.
- Stabilizing the catch in the hold.
- Less damage in the fish because of less intensive pumping compared to a RSW system.

- Can be used together with a RSW system to increase the initial cooling of the catch.

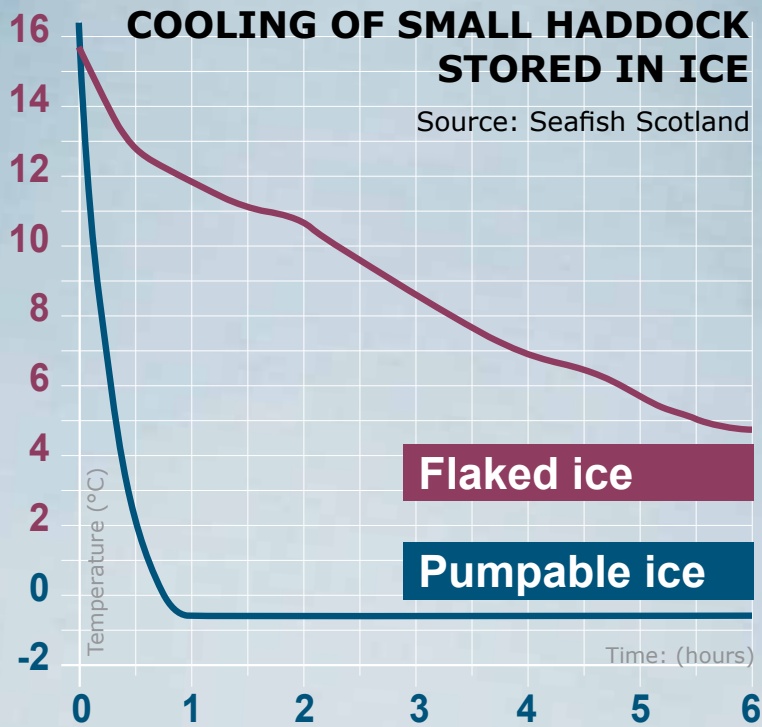
The first installation in a boat was carried out

in 1999 with very good results, giving the boat an edge over other Icelandic boats at that time.

Many large installations have been carried out in large boats in the Vestmann Islands. The boats rely only on Optim-Ice® as a cooling method to bring high quality fish ashore. Due to the faster initial cooling of the Optim-Ice® the flesh is firmer than the fish brought ashore by RSW boats.



# OPTIM ICE



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