

# Slurry ice generator

## KAIHYO



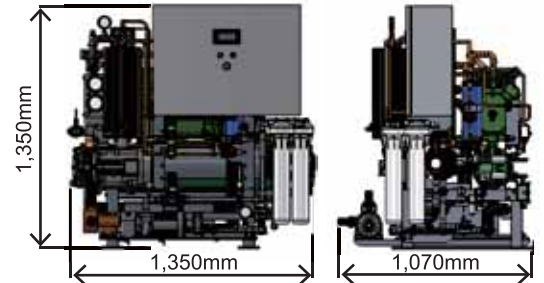
### About KAIHYO

KAIHYO is designed in compact perfectly fitting in small and medium-sized vessels. Especially, the NCK-105WH can be installed on small fishing boats of 19 tons or less.

The key advantage is the direct production of slurry ice from seawater adjusting the ice production based on the actual fish catches.

There had been excess loading of ice and the workforce for loading the ice. KAIHYO will be not only contributing the reduction of workforce but also saving fuel consumption by avoiding excess loading of ice.

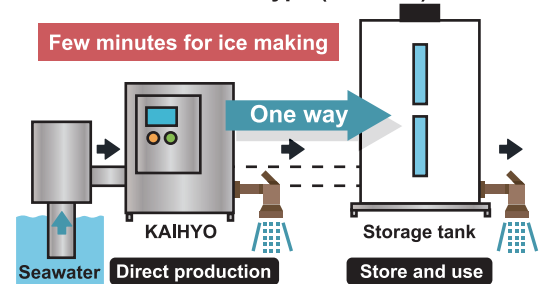
NCK-105WH



### Method

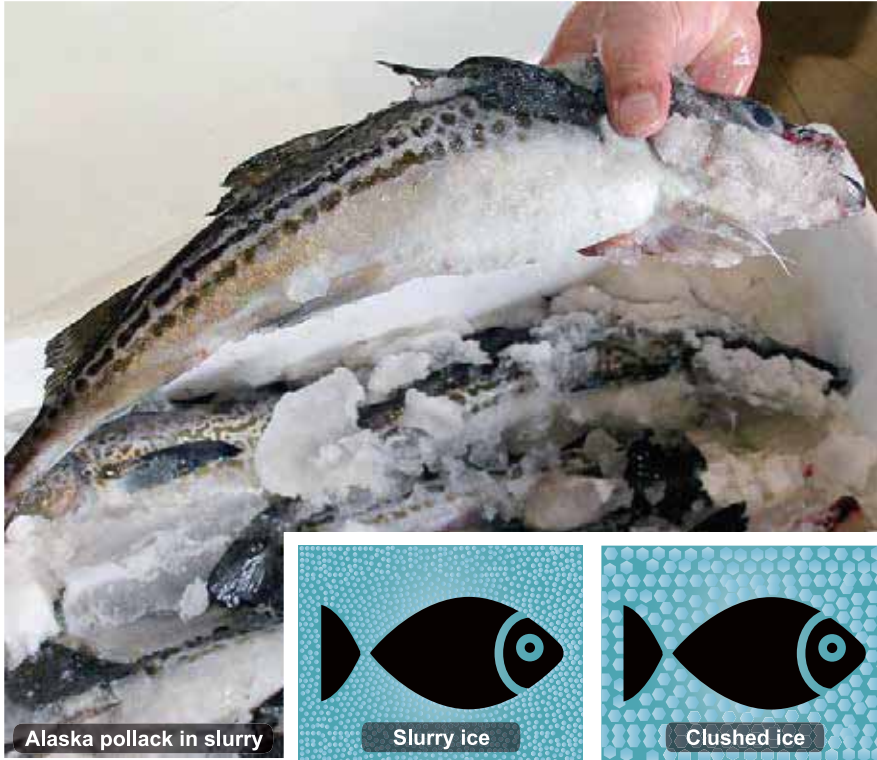
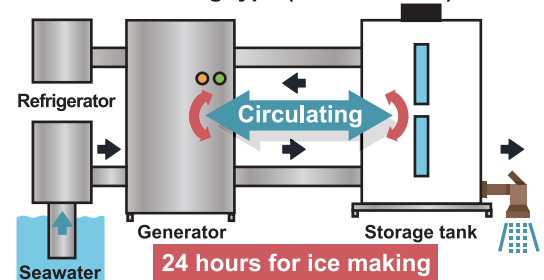
For conventional type, the production time takes 24 hours slowly producing slurry ice by circulating the seawater between a generator and a tank. Unlike the conventional type, KAIHYO is a continuous type producing slurry ice right after turning on the power.

#### Continuous type (KAIHYO)



※ When using a large amount, store the ice in a tank.

#### Circulating type (Conventional)



Slurry ice is ideal method for rapid chilling of fishes on board with the microscopic ice crystals surrounding the entire surface area of fish body being cooled at least three times faster and stored a few degrees colder than conventional ice. It ensures not only the rapid cooling but also the optimal temperature (HYO-ON) range for aging fishes.

### Characteristics



#### Stability

Ice production with stable temp. and salinity



#### Continuity

Continuous production up to water temp. +28°C



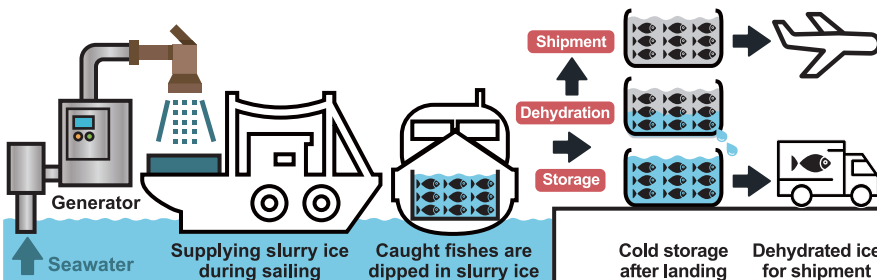
#### Flexibility

Amount adjusted according to the fish catch



#### Compact

Compact perfectly fit in a fishing boat



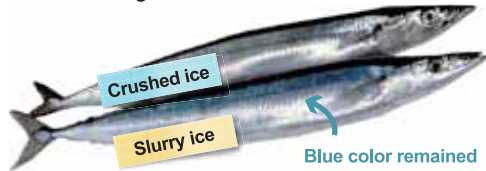
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## Freshness

Pacific saury stored in slurry ice retained the blue color while conventional crushed ice hardly showed the original color.

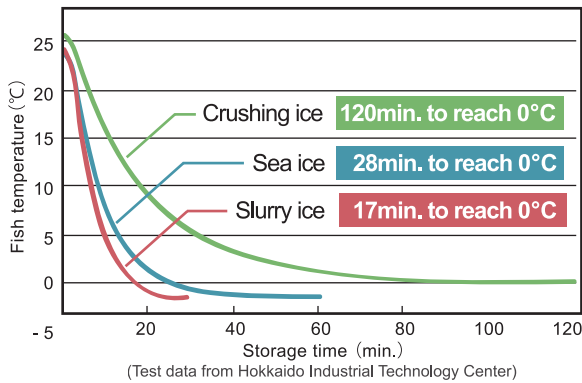


The fresh saury has a silver belly, a yellow beak, and a blue back. Judging from the appearance, it can be seen that slurry ice has a higher cooling capacity than crushed ice.

## Cooling effect

Comparing to the body temperature change in Pacific saury using slurry ice, crushed ice, and sea ice (seawater mixed with crushed ice), the test data shows that the slurry ice cools faster than the others. This is because the smaller the ice, the larger the specific surface area and the higher the thermal conductivity. It means cooling quickly.

The cooling speed is one of the important factors for maintaining freshness.

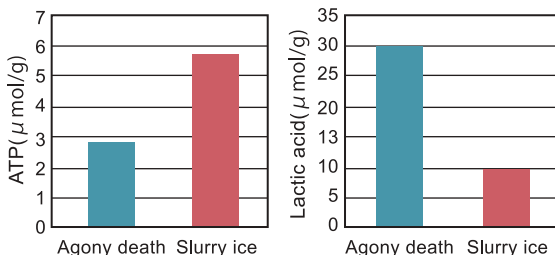


## Ikejime effect

When a fish rampages and dies, freshness is lowered by decreasing ATP and increasing Lactic acid. In order to avoid the enzymatic breakdown, fishermen use the technique called "ikejime".

Slurry has the similar effect as ikejime.

### ATP and lactic acid contained in muscles



## Comparison

After rigor mortis, the function of enzymes in fish increases inosinic acid which is an umami component. This enzymatic action is used as a technique of aging.

When the rigidity is released, the bacteria in the fish body start making the fish rot. So to make the fish delicious, rigor mortis should be delayed as much as possible, and bacterial activity should be suppressed.

Slurry ice answers these requirements by maximizing the umami component while extending the shelf life.

### Slurry ice



Rigor mortis



Blood left

Blood is not circulating

### Crushed Ice



Relaxed state



No blood left

Blood is circulating

## Specification

### Small-medium vessels Medium-large vessels Options



	Model	Marine/Land	Land	Marine
		105SH	105AH	105WH
Dimension	Full Length	1,150mm	2,940mm	1,350mm
	Full Width	1,230mm	1,210mm	1,070mm
	Overall Height	1,940mm	1,930mm	1,350mm
Capacitance	50Hz	200V 1.5kW	200V 14.1kW	200V 10.6kW
	60Hz	200V 1.5kW	200V 16.7kW	200V 10.5kW
Cooling capacity	50Hz	20.0kW	20.0kW	20.0kW
	60Hz	20.0kW	20.0kW	20.0kW
Ice making capacity	Density 40% (About - 3.5°C)	240ℓ/h	240ℓ/h	240ℓ/h
	Density 30% (About - 2.9°C)	310ℓ/h	310ℓ/h	310ℓ/h
	Density 20% (About - 2.6°C)	370ℓ/h	370ℓ/h	370ℓ/h
	Density 10% (About - 2.3°C)	450ℓ/h	450ℓ/h	450ℓ/h
	Cold seawater (0°C)	590ℓ/h	590ℓ/h	590ℓ/h
Circulating water flow	50Hz	—	—	4,440ℓ/h
	60Hz	—	—	4,440ℓ/h
Raw water	Temperature	Under +28°C	Under +28°C	Under +28°C
	Salinity	3.0~3.5%	3.0~3.5%	3.0~3.5%
	Pressure	Over 0.4MPa	Over 0.4MPa	Over 0.4MPa
Refrigerant	Evaporation temp.	- 20°C	- 20°C	- 20°C
	Water cooling condensation temp.	—	—	+35°C
	Air cooling condensation temp.	—	+35°C	—

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