

# ThorIce

Securing Longer Shelf Life



“ Passport “



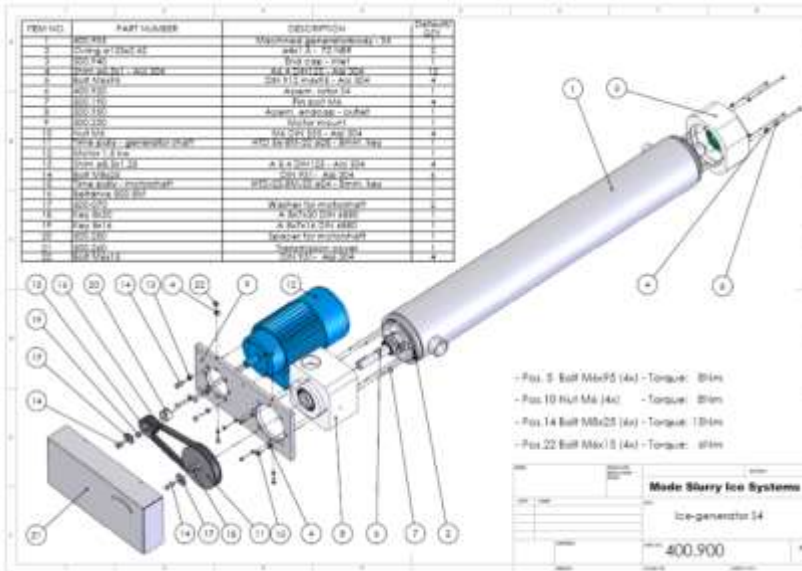
## Who are we?

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- Started in 2003
- Main emphasis on fish quality and the environment, using slurry ice
- Research projects with Matís (RF)
- What is the need?
- How do we ensure the highest quality?
- How can we cooperate?

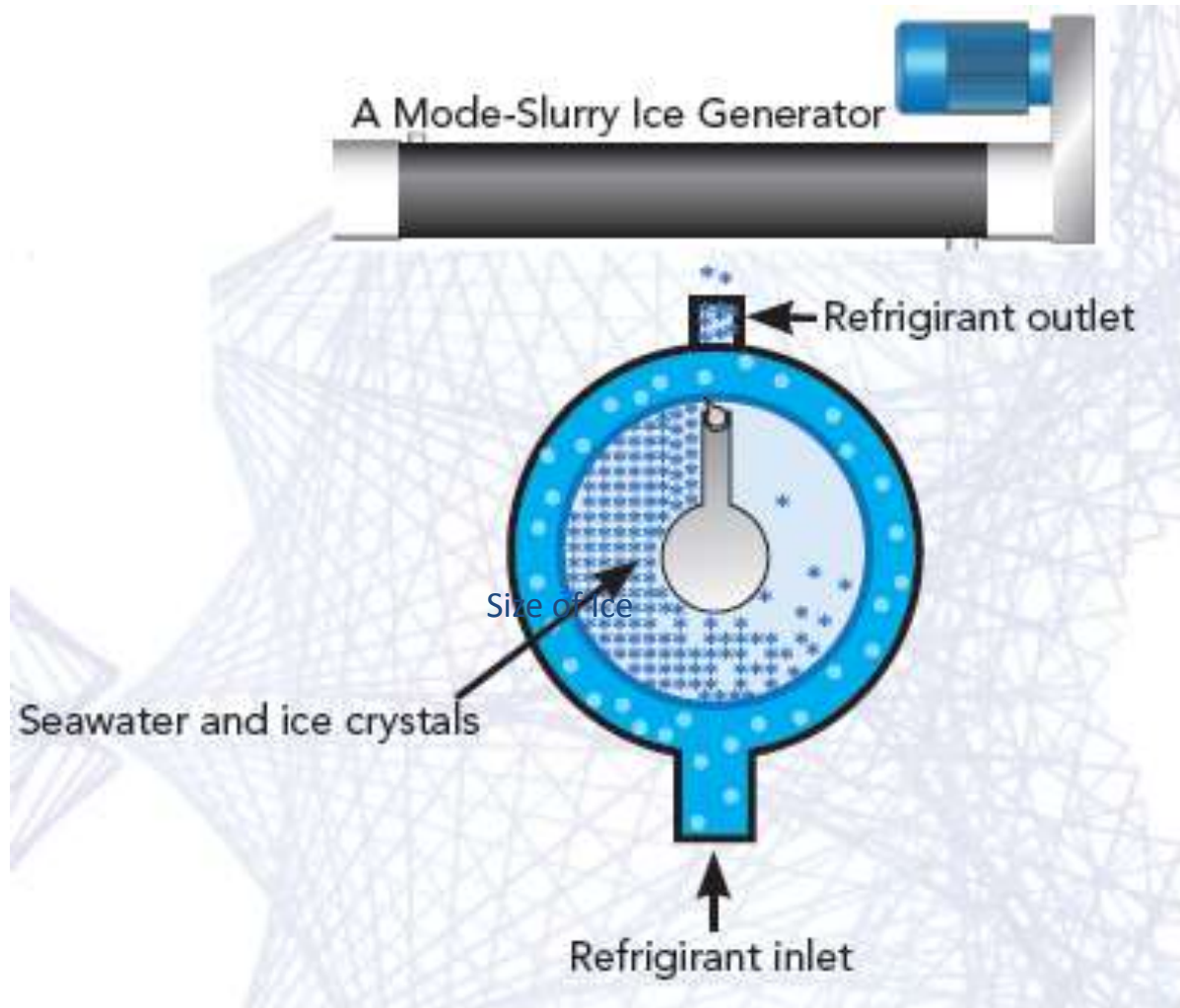
From micro to macro

from 70 to 14.000 liters/hour



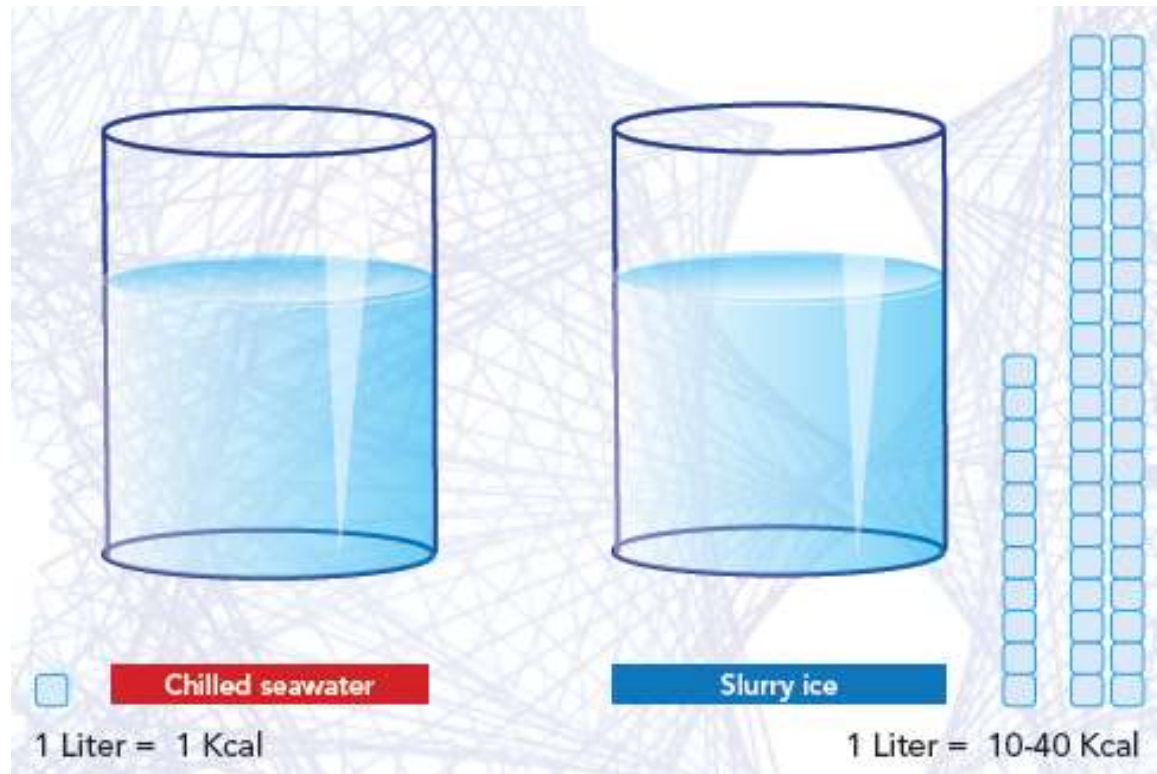


# What is Slurry Ice ?

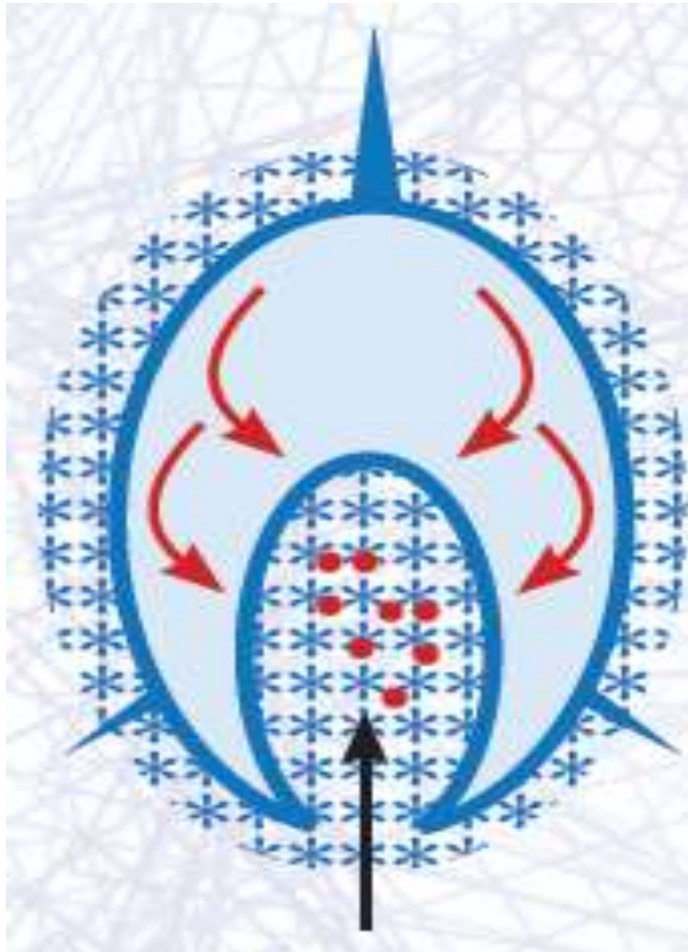




# Slurry Ice VS Chilled Sea Water

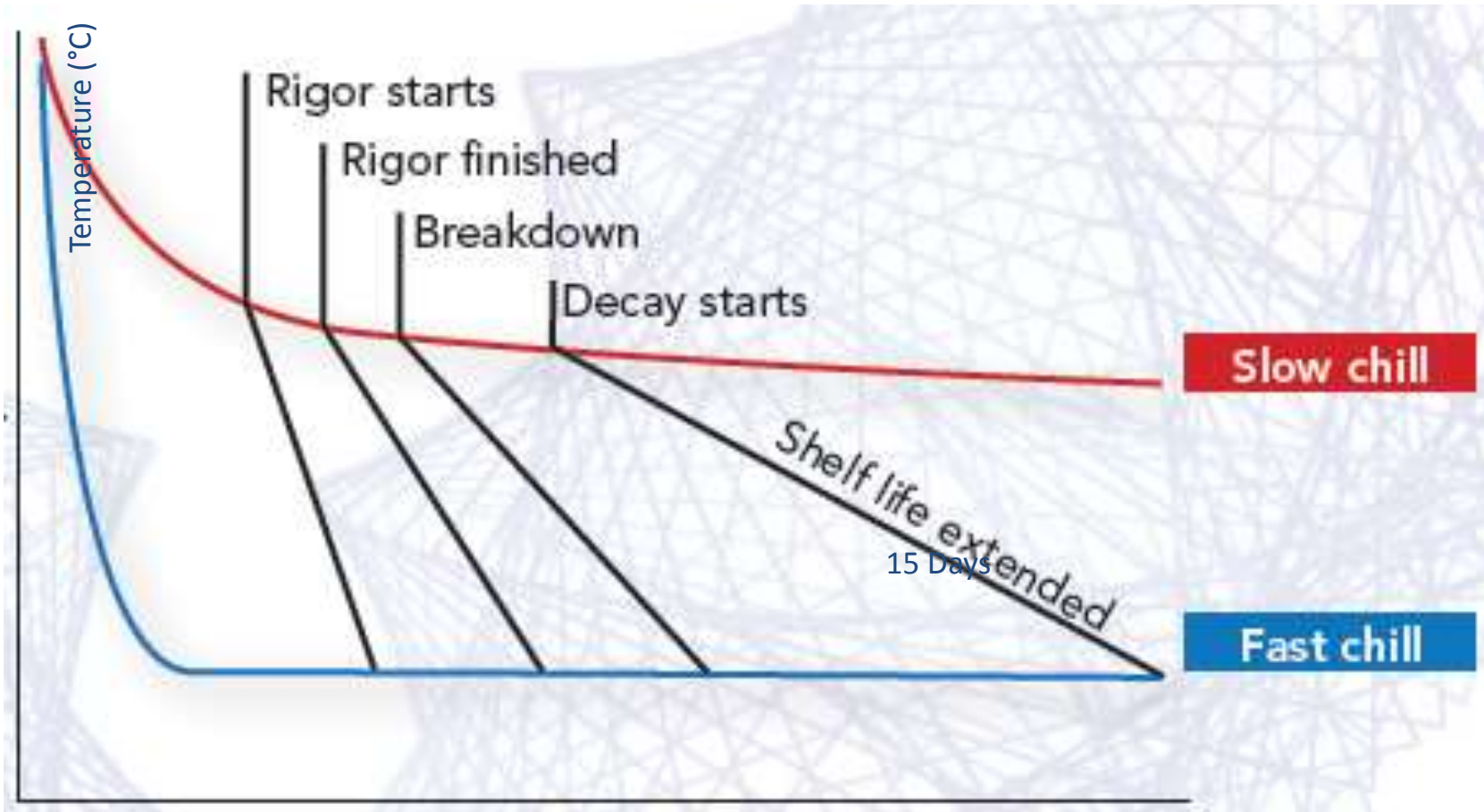


## Effect of Slurry Ice on Blood Drainage in the flesh



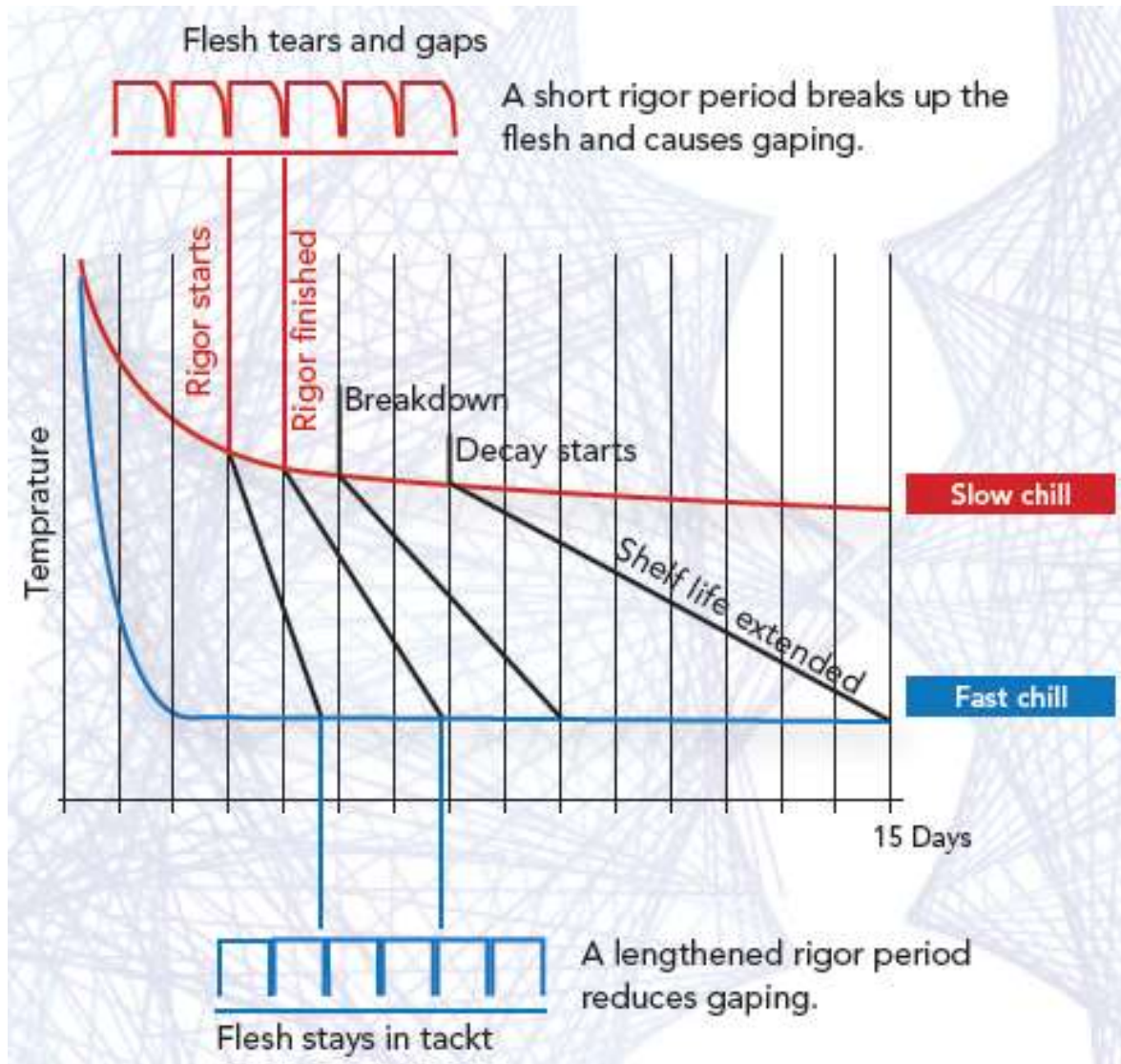
Contraction presses the blood to the gut area if the fish is chilled quickly. This must happen quickly or the effect doesn't take place.

# Effect of Slurry Ice on Rigor

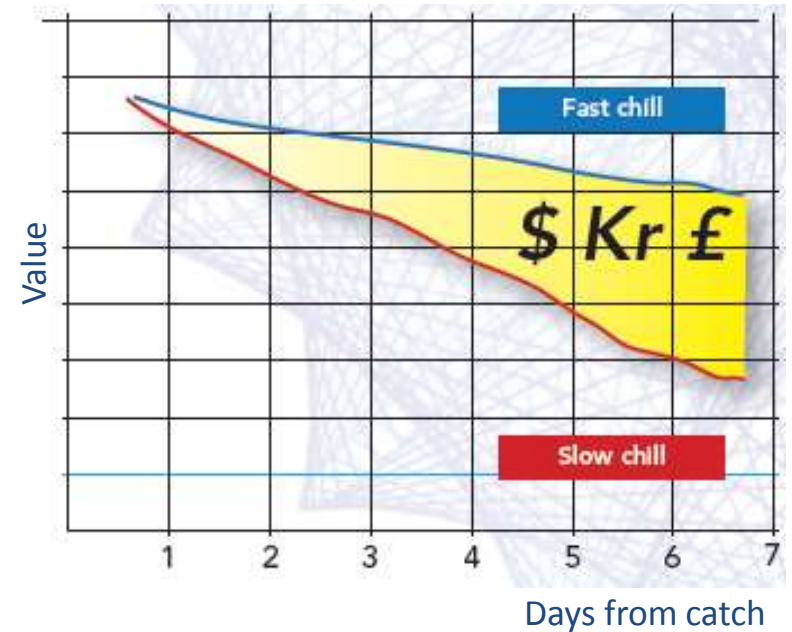
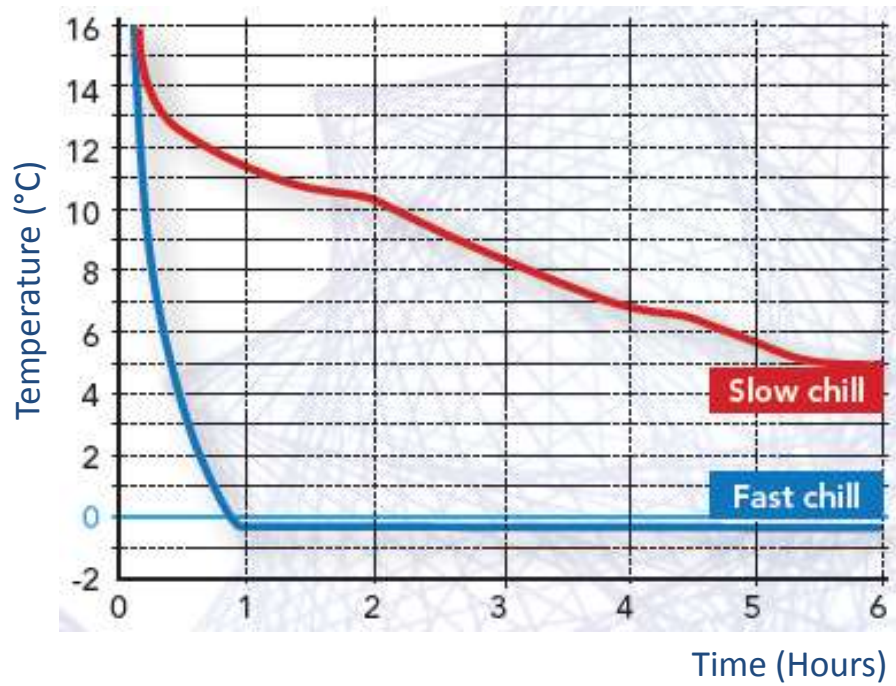




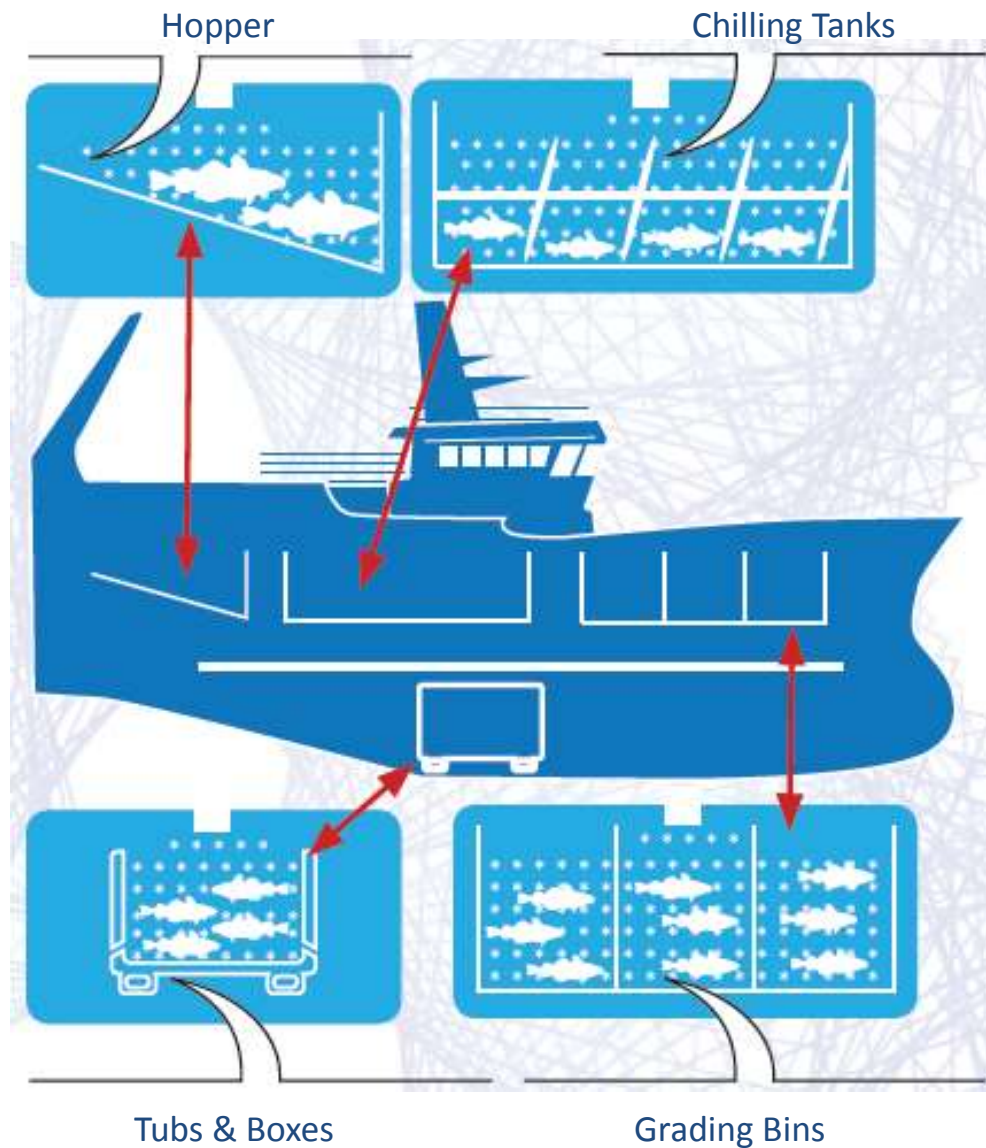
# Effect of Slurry Ice on Gaping



# Difference in Chilling Speed



# How is Slurry Ice used on Board ?



## Cooperation?

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- How can we cooperate?
- Trials and tests?
- Machine rental programs?

# Our machines are used on board

The compact  
S-100c and S-50c

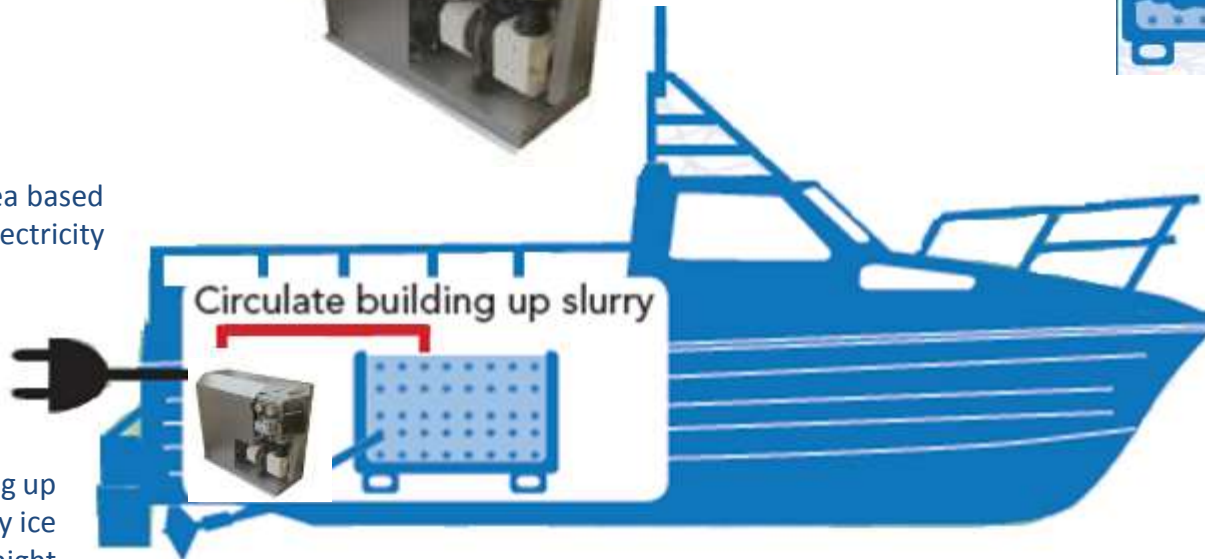


Start with ice in bottom



25%-35% ice  
concentration  
in the tub

Shore or sea based  
electricity



Building up  
slurry ice  
overnight

Fill bin with fresh seawater  
before starting production

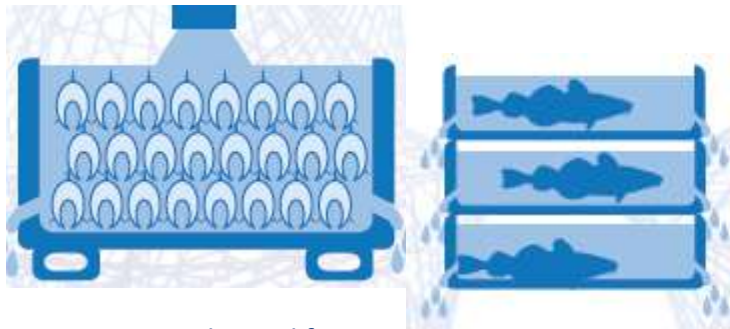


Fill fish into the tub





# Slurry Ice in Tubes and Boxes

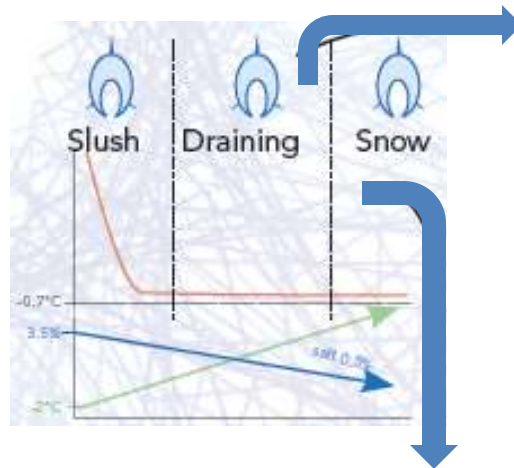


## Tubs and boxes

The fish chills rapidly when the ice melts and the seawater drips out, cleaning the fish simultaneously

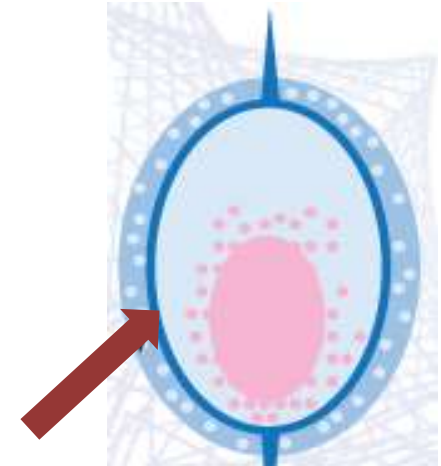
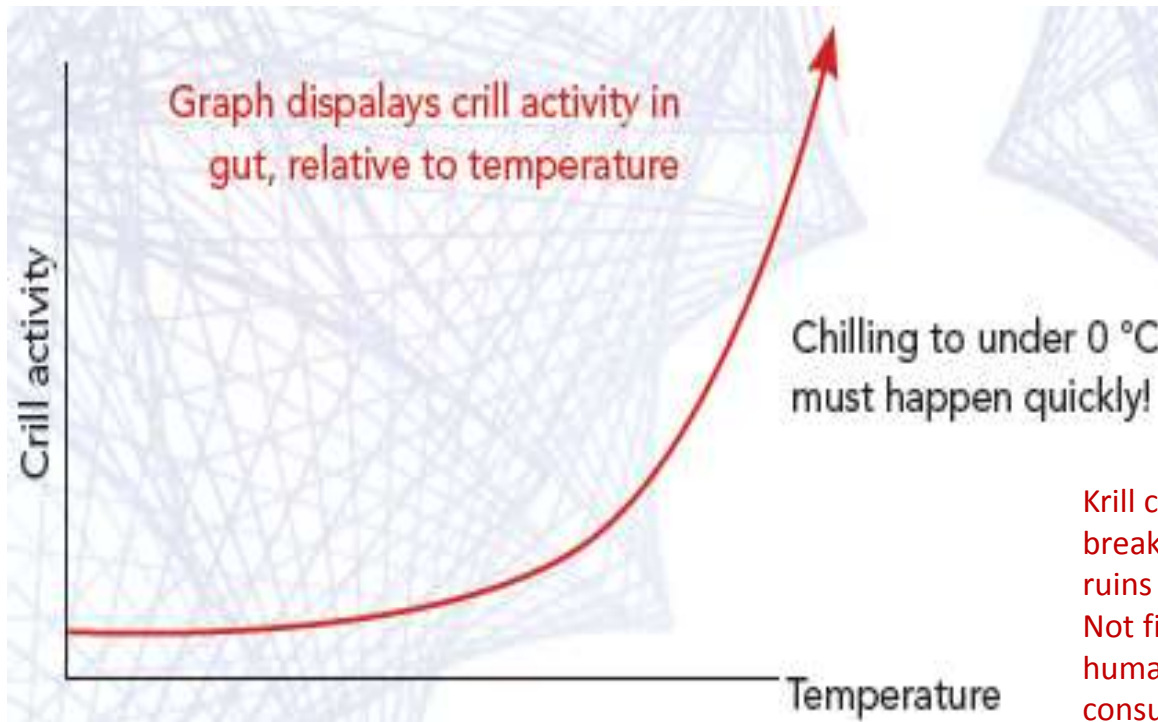


as seawater is drained from bins and boxes the slurry ice begins to crystallizes into snow



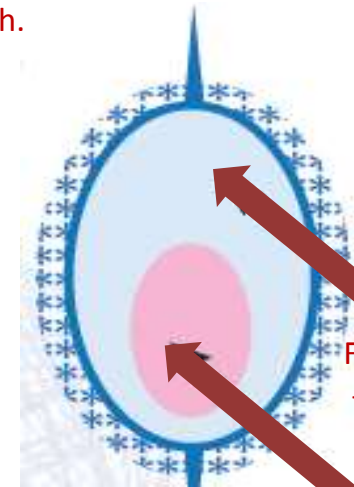
When fully drained, the product and ice has reached the ideal storage temperature of  $-0,7^{\circ}\text{C}$  Salt content has been reduced to less than 1%.

# Can slurry ice increase quality in pelagic fishing?



Slow chill

Krill causes breakdown and ruins the flesh. Not fit for human consumption

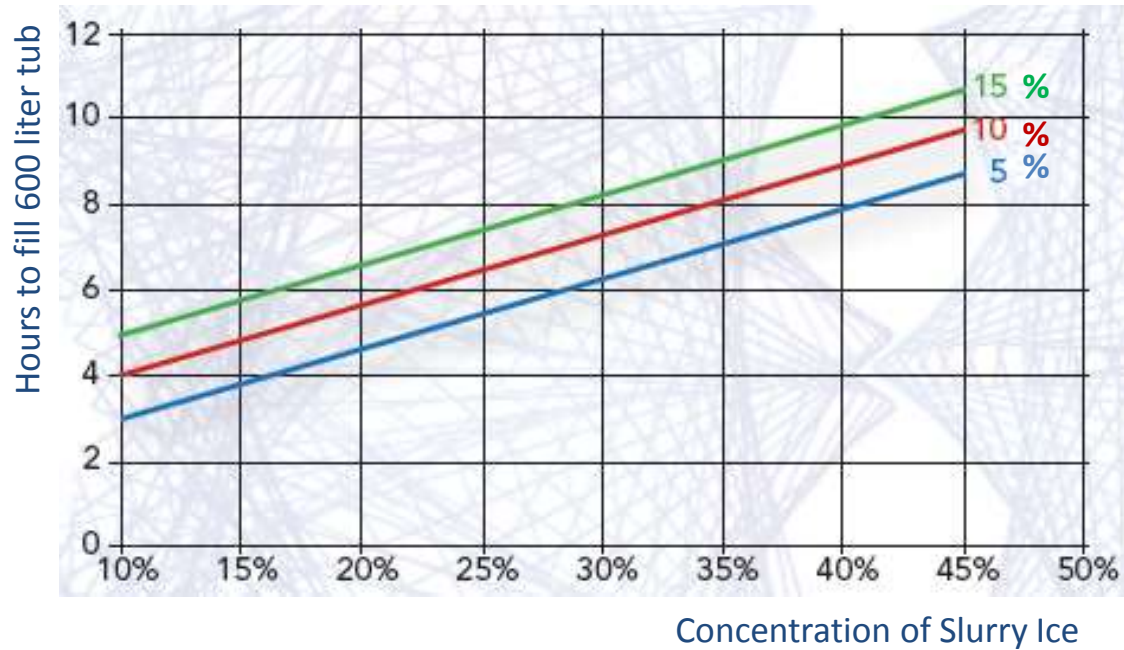


Fast chill

Freeze at -2.5°C

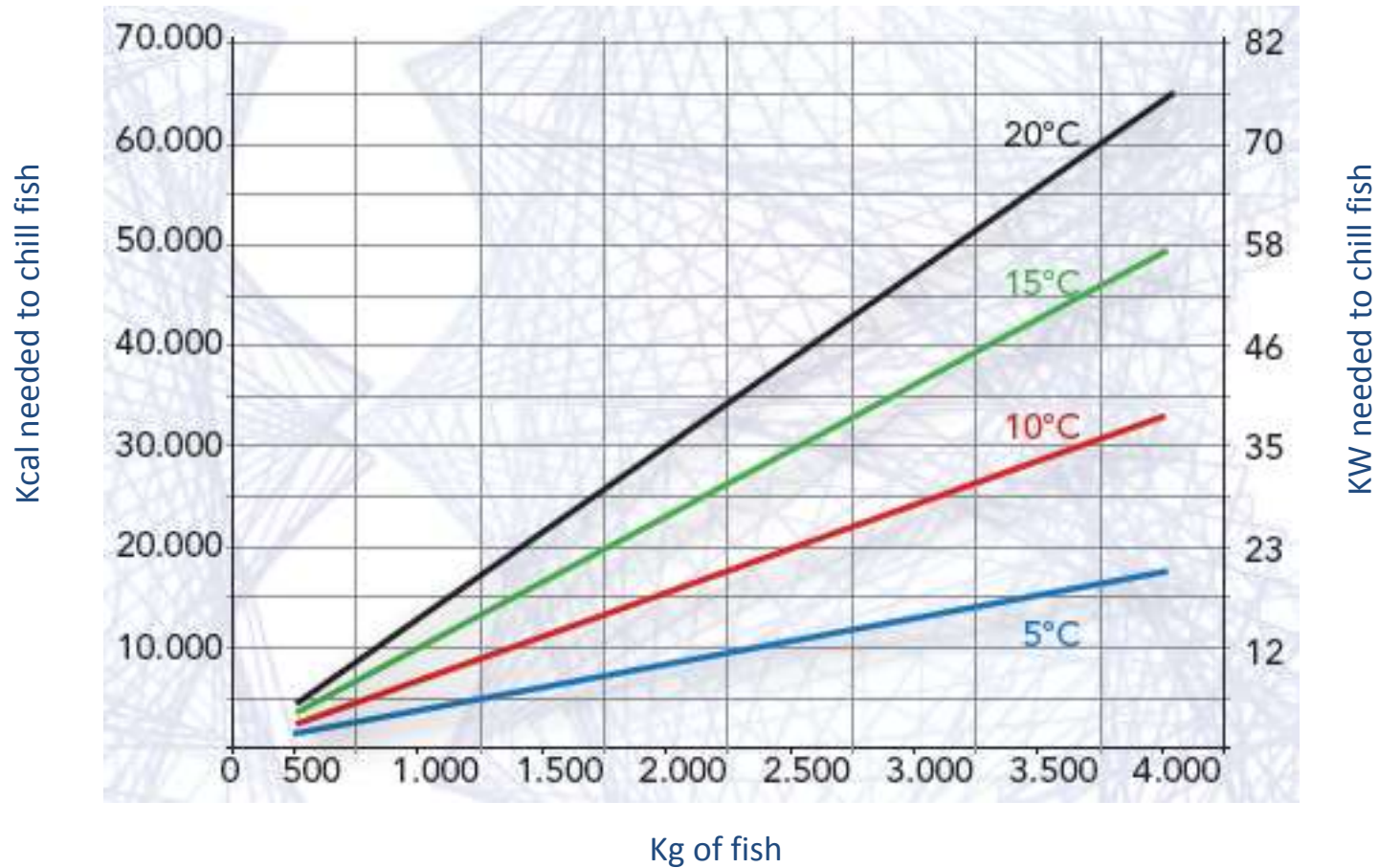
Freeze at -1.5°C

# How long does it take to make a tub of ice?



# How much energy is needed to chill my catch?

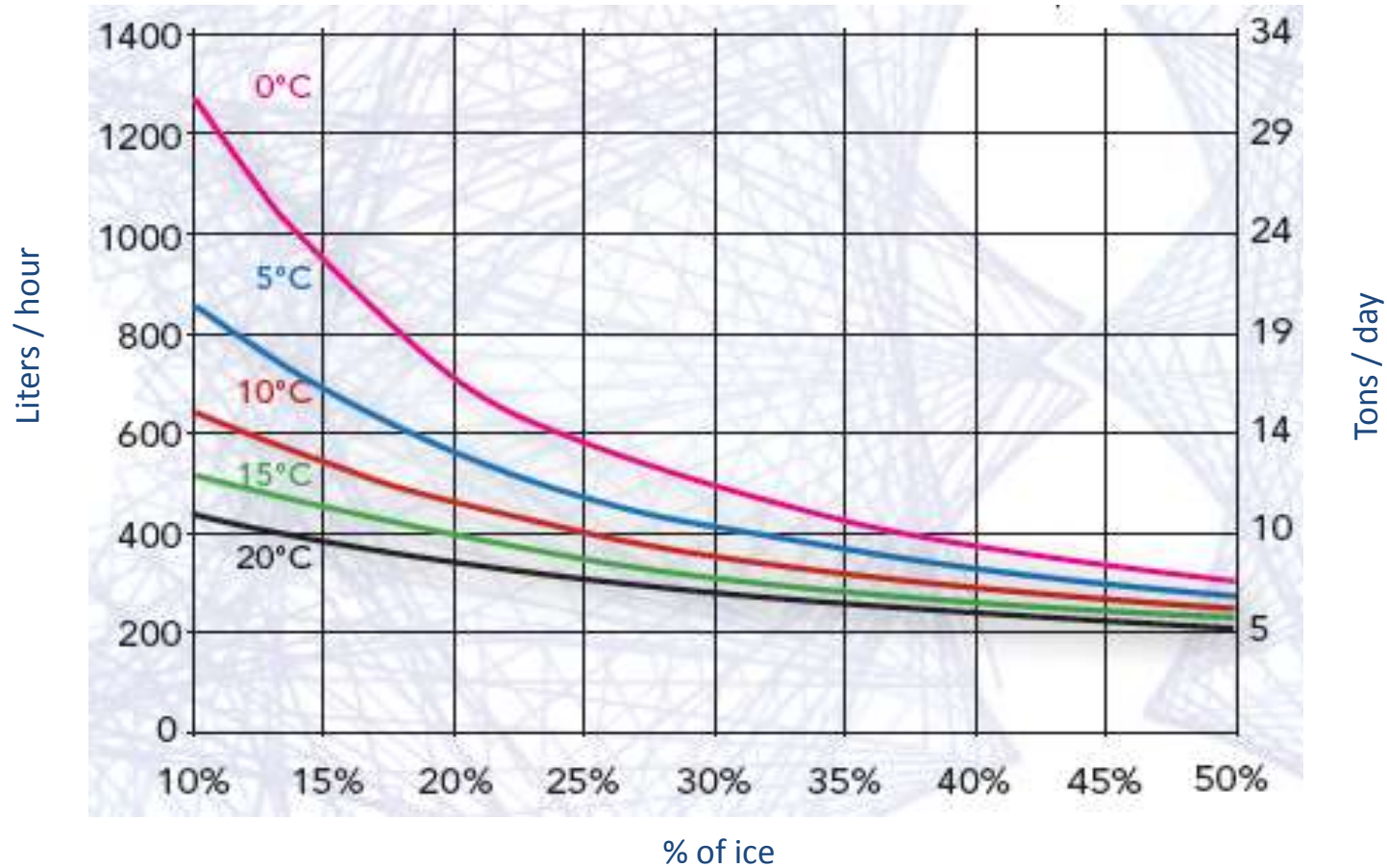
Kcal and KW needed to chill fish as function of temperature





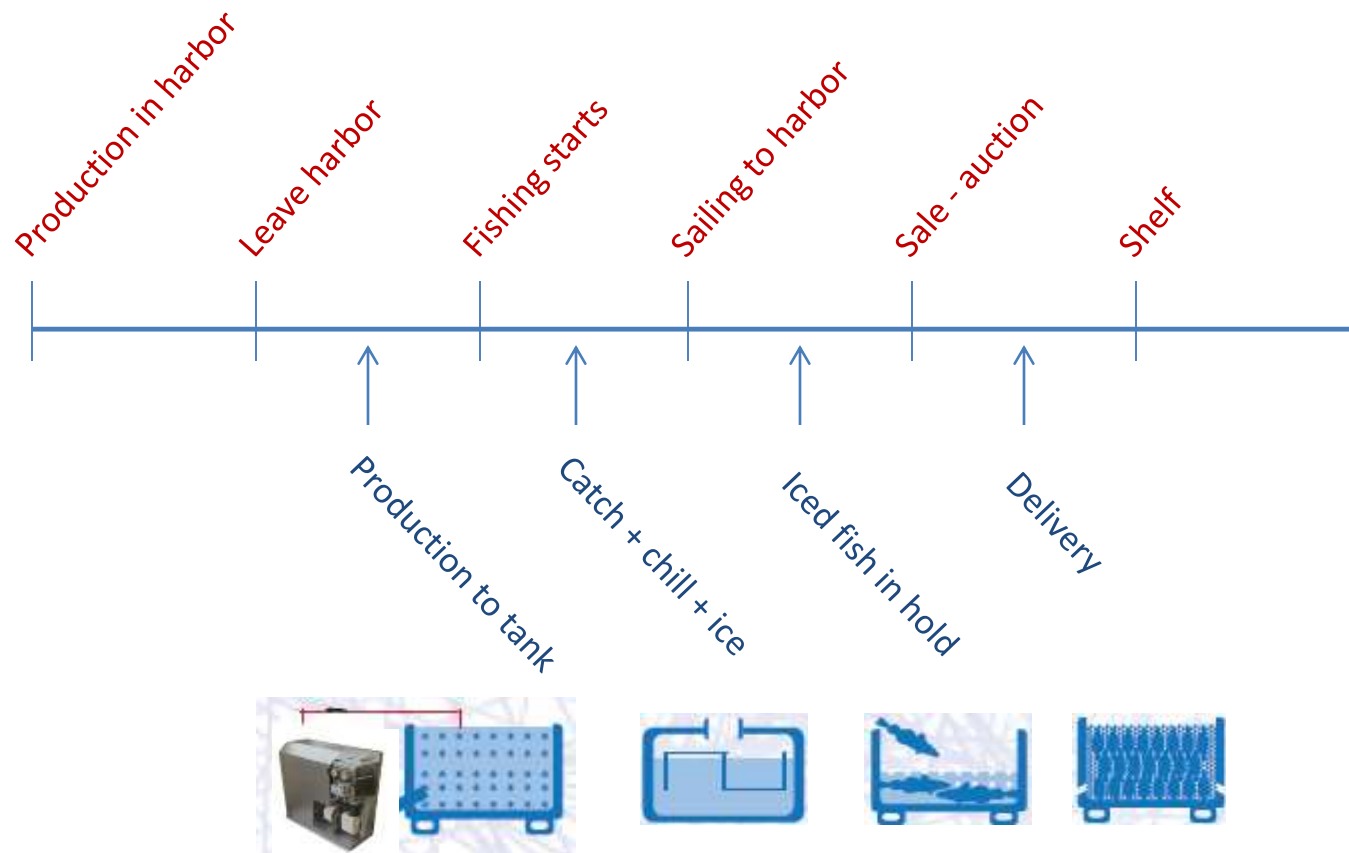
# What is the capacity of Mode Slurry Ice Generators

Liters/hour of slurry (variable thickness)



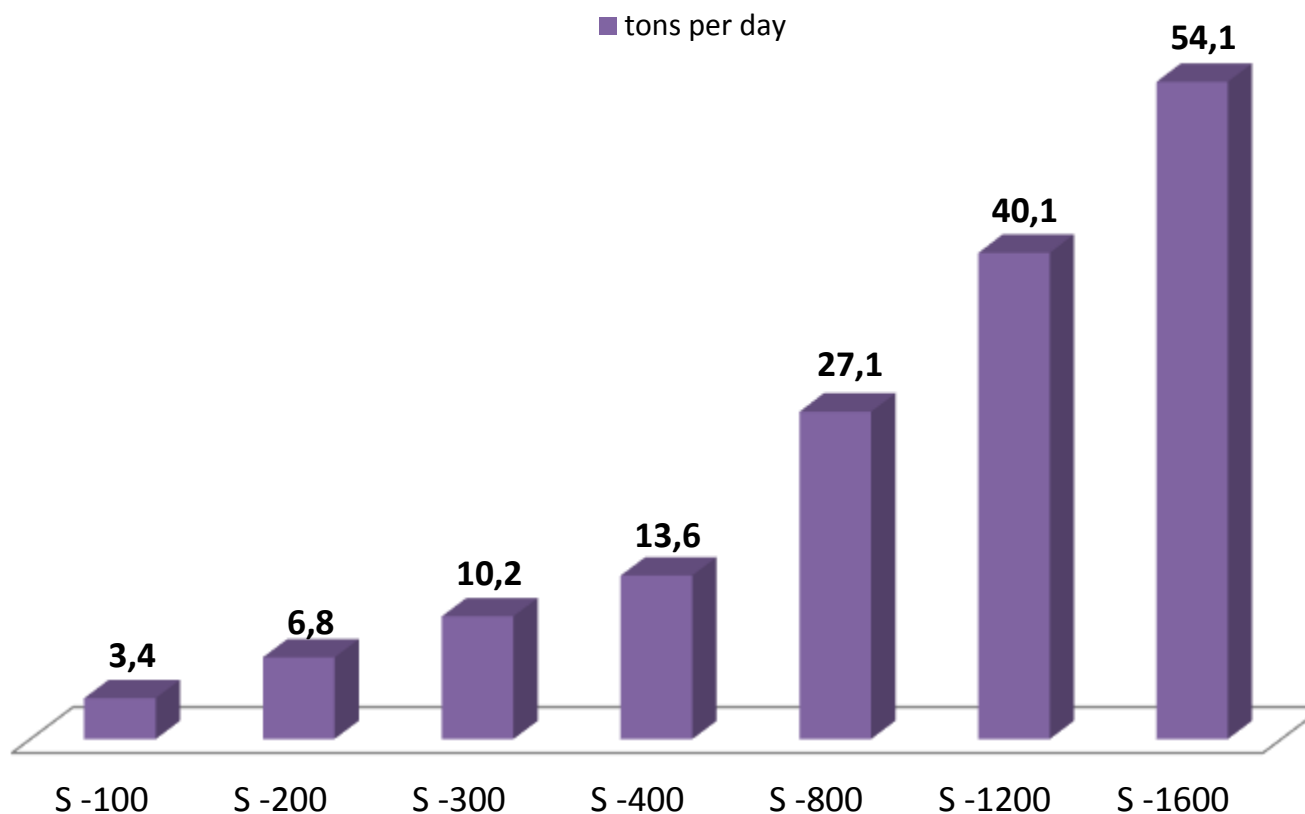


# What is your chilling timeline ?



# Generators and Machine Capacities

S-1 has 1 blade, S-2 has 2 blades, and S-4 has 4 blades per generator. All machines larger than S-4, have a multiple of S-4 generators.



# Generators and Machine Capacities

This is not from the “passport” but maybe we could use it

Machine	Capacity(Kw)	Power (Kw)	Liters/Hour	Voltage	W x D x H	Frequency
S - 50	1	0.85	38 - 240	24 / 230	70x25x50	50 /60
S -100	3.5	1.75	80 - 500	230 / 400	70x25x50	50 /60
S - 200	7	3.5	155 - 989	400	90x30x60	50 /60
S - 300	10.5	5.25	233 - 1484	400	120x30x60	50 /60
S - 400	14	7	310 - 2.000	400	150x40x60	50 /60
S - 2400	84	42	1.800 - 12.000	400	container	50 /60
S - 2800	98	49	2.100 - 14.000	400	container	50 /60
S - 3200	112	56	2.500 - 16.000	400	container	50 /60
S - 3600	126	63	2.800 - 18.000	400	container	50 /60
S - 4000	140	70	3.100 - 20.000	400	container	50 /60

## mode - slurry ice systems

**CE 640**

**Production year: 2006**

**Serial no.: 0634023-S4**

**Max. operating pressure PS: 25 Bar**

**Min/Max. operat. temp. TS: -35/+50 °C**

**Volume: 7.4 liters**

