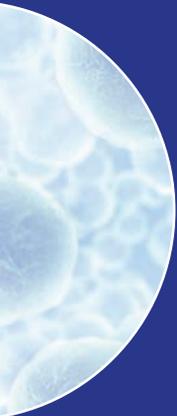


DeepChill

The Science of Fresh



**Preserving
your investment**

Is DeepChill right for you?

Is the DeepChill seafood chilling technology right for your operation?
Answer these 7 questions as the first step in finding out:

1. *Do you catch, process or market high value fresh seafood?*
2. *Can flake or crushed ice damage the species you handle?*
3. *Does your automated processing require peak flesh quality?*
4. *Do you need the ability to spend longer periods at sea?*
5. *Could automated slurry delivery reduce labour costs?*
6. *Would your business benefit from reduced spoilage?*
7. *Could displaying fresh product better improve your sales?*

If you answered YES to 3 or more questions, a DeepChill system may make economic sense for you. Please contact us to explore using DeepChill in your operations.



Onboard with Quinlan Brothers

Situation: Quinlan Brothers, one of Newfoundland's largest fishing companies, wanted to maximize the catch capacity and trip length of its newest ship, OSC Mariner, while still producing shrimp able to satisfy the world's most demanding markets.

Solution: Sunwell customized an onboard DeepChill system able to handle 10,000 pounds of shrimp every 3 hours. Shrimp are flooded with a 40% DeepChill slurry in on-deck tubs and rapidly chilled to 0°C before being drained for storage.

Results: DeepChill enables each tub to hold significantly more shrimp compared to ice, increasing Mariner's catch capacity. The quality results are equally impressive. According to Quinlan Project Manager Brian Collier, "Compared to a trip using flake ice for the same fishing period, the quality of shrimp in DeepChill is 2 days better in colour, freshness, firmness, and taste."

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How DeepChill works

The heart of a DeepChill system is the ice generator (right). Our patented process cools salt- or freshwater to the freezing point while an auger sweeps the chamber walls to prevent formation of sharp-edged crystals. Ice forms as tiny pearls around single crystals in suspension.

The resulting slurry is stored, and then pumped over all exposed surfaces, chilling product to near freezing in just minutes. Water can be drained off to leave product fully protected and packed.

In addition to faster chilling, Deepchill has other advantages over conventional ice. It's more energy efficient to produce and less labour intensive to use. DeepChill's near-liquid slurry won't harm delicate species the way flake or crushed ice can. And, because a sphere has the highest content-to-surface-area of any shape, DeepChill packs more holding power than other ice forms.

A typical DeepChill installation includes storage tank(s) and distribution and control systems. The system can tailor slurry characteristics, including crystal size, temperature and water content for specific applications.



Fresh to the processor

Situation: Huon Aquaculture Group is Australia's leading producer of fresh salmon. Their challenge was temperature control when transporting fish from their 2 farms on Tasmania's south and west coasts to their processing plant in the north. The crushed ice used in their tanker trucks could not maintain flesh quality during the 200 km trip, especially in 30°C summer temperatures. Their solution, shipping fewer fish per load, sacrificed efficiency and capacity. A secondary issue was keeping fish cool in the processing plant itself.

Solution: Sunwell customized a mobile system that produces DeepChill at -1°C to serve both the transports and the processing plant.

Results: Huon is now able to pack its tankers to capacity and to retain optimum temperature control and flesh quality during both transportation and processing. The company recently decided to order a second DeepChill system.

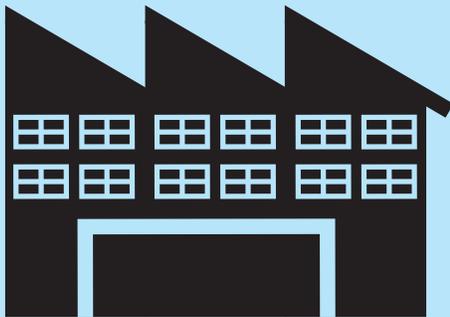
“ *Every part of our production process, from farm to factory, is world class and uses the latest technology.* ”

The lifecycle of fresh



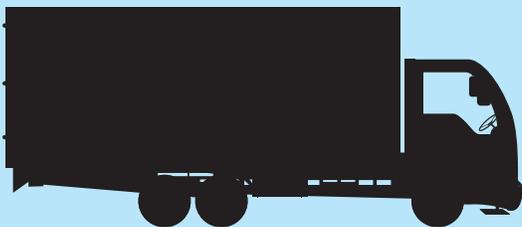
ONBOARD DeepChill onboard chills, protects and holds catches in peak condition for up to 3 days

- Chills catch to -1°C in minutes
- Eliminates ice purchases
- Extends fishing time
- Improves quality of peak catches
- Reduces icing labour
- Reduces spoilage



PROCESSING DeepChill for processing retains peak flesh quality

- Holds product at peak freshness
- Improves automated filleting, pin boning
- Longer hold extends processing window
- Reduces processing labour
- Less spoilage results in higher yields
- More energy efficient chilling
- Enables HACCP compliance



SHIPPING DeepChill for distribution holds longer, reduces weight

- Maintains peak freshness
- Longer hold extends trip lengths
- Reduces weight for lower shipping costs
- Retains moisture, avoids shrinkage
- Reduces spoilage for higher yields
- Reduces ice production/purchase costs



DeepChill in seafood markets

DeepChill systems are increasingly used in large fish markets (see case study below) to hold and present fresh seafood that commands the highest prices. The near-liquid DeepChill saltwater slurry holds product at peak freshness with no damage, resulting in increased yields. Centralized slurry production and piped delivery are energy and labour efficient. And, because it's more hygienic than handling loose ice, DeepChill also improves HACCP compliance.

CASE STUDY

Wholesale fish market

Situation: Japan's Ofunato fish market was destroyed during the 2011 tsunami. When planning to rebuild, the fishery association decided to explore new chilling technology to produce the highest quality seafood. The technology would have to serve the entire market and respond quickly to large catches.

Solution: Sunwell worked with Ofunato to design a revolutionary system that delivers DeepChill on demand throughout the market via a 600 m loop and multiple pumps.

Results: Ofunato reopened in 2014 and enjoys 20% higher efficiency than the old market, thanks in large part to its DeepChill system. Another benefit is improved hygiene, due to DeepChill's closed loop process. During his visit to Ofunato, Japan's Prime Minister Shinzo Abe said Ofunato "has introduced leading-edge technologies for hygiene management. The value of its catches has surpassed the level it enjoyed before the disaster."

“Ofunato has introduced leading-edge technologies for hygiene management. The value of its catches has surpassed the level it enjoyed before the disaster.”



DeepChill around the world



About Sunwell Technologies

Founder and chairman Vlad Goldstein invented and commercialized ice slurry chilling technology over 35 years ago. Since then DeepChill installations have logged more hours worldwide on more seafood applications than any other ice slurry system.

In addition to improving efficiency and partnering with clients on new applications, Sunwell continues to improve DeepChill reliability. We're making ongoing investments in standardization, automated monitoring systems and stronger service agreements to benefit our clients.

Our Promise: The Sunwell team will support you in choosing the right DeepChill system, efficiently integrating it into your operation, and ensuring your system provides years of reliable service.



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