

Catalog 1



The technology created by dream is CAS engine that revives cells.

Bringing smile to people

ABI CO.,LTD.

President
Norio OWADA



Seeking for people's happiness, we have made many basic researches at medical institutions in and out of Japan and achieved results.

Now, the adoption of CAS has begun around the world. Ingredients that use the CAS engine return to raw state as much as possible when thawed. Therefore, CAS ingredients are widely used as a material for cuisine by French MOF cook technicians, world-class chefs, and Michelin-starred shops in Paris.

It is said that the world's population will increase from 10 billion to 13 billion in the future. ABI is promoting preservation to ensure a stable supply of ingredients and technology to realize ingredients and foods that are always delicious.

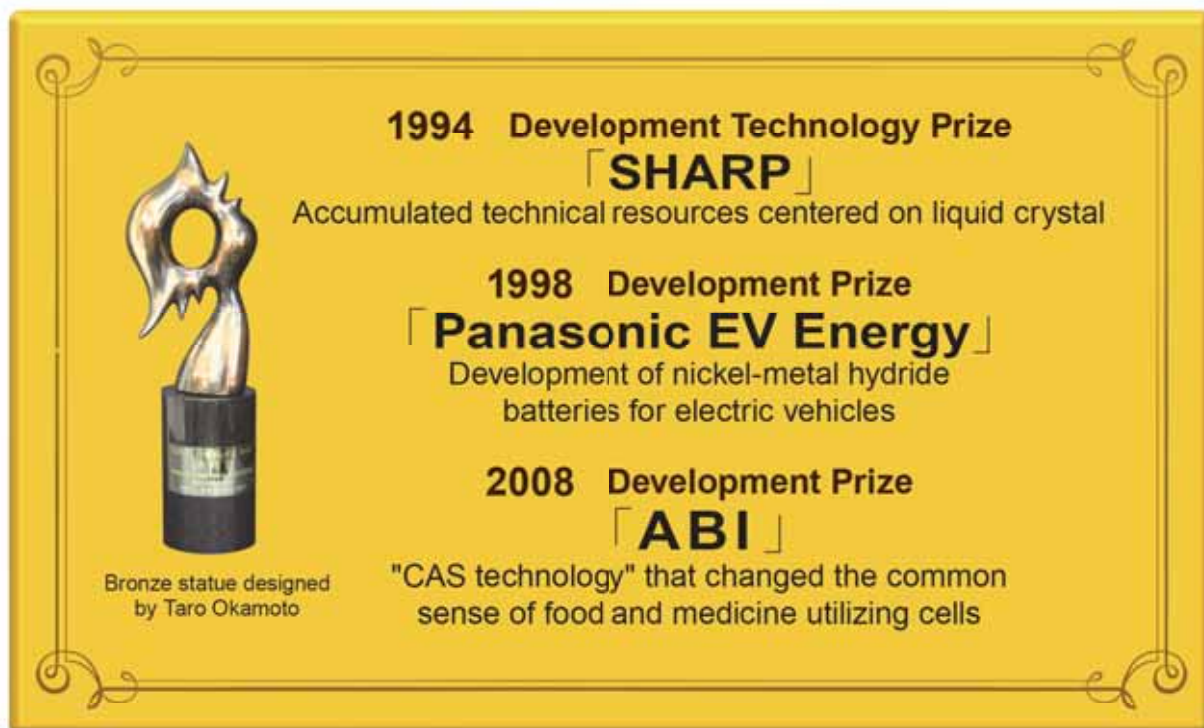
As climate change becomes a major problem in the world and global warming is progressing, fishery harvest amount are declining, agriculture is also affected, and production tends to decrease. The world is now in the age of preservation.

By ABI's CAS and Harmonic System, fish can be preserved for five years and thawed to return to almost raw. The same is true for livestock, and we are working with farmers to further research better ways to stockpile.

Mr. C. Edward Gaunch of West Virginia Secretary of Commerce in US came to our laboratory in May 2019. We exchanged opinions on food reserves, including agriculture, fisheries, livestock and processed foods, for 100 to 130 million people worldwide. We came to the conclusion that it was necessary to reproduce not only the frozen stock but also the delicious and fresh taste. Mr. Gaunch said that he wants to bring this state-of-the-art technology to US to store foods, which are frozen by CAS, and by Harmonic Oscillating system.

Awarded "Japan Creation Prize" "SHARP, Panasonic and ABI"

Open up the era from a creative perspective regardless of genre



Global food manufacturers who install CAS engine to tunnel freezers, spiral, rack-type, and small existing quick freezers are increasingly.

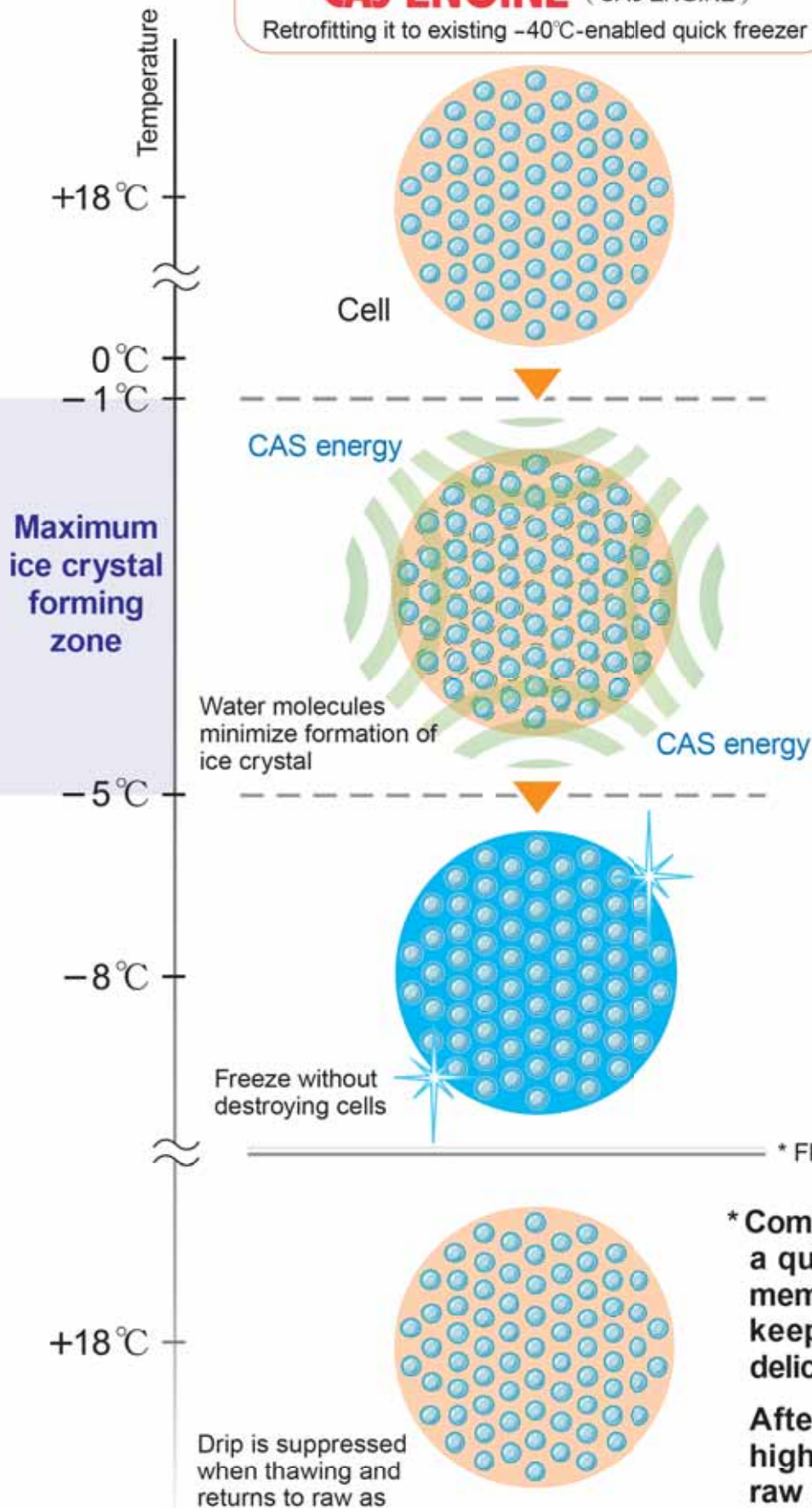
Until now, in Japan, the word "CAS freezing" was preceded, and customers misunderstood that "CAS is one of quick freezers". However, ABI's CAS engine is quite different technology from the quick freezer, it's a technology that revives cells to maintain deliciousness and freshness. The CAS engine can be installed on your existing quick freezers. Our business spans technology development to manufacturing and sales of ABI's quick freezer, combining CAS functions in accordance with the characteristics of each foodstuff.

Electricity rates are surprisingly low because they are energy-saving systems. As an example, in order to CAS-freeze of a 200 kg tuna fillet costs only 4 yen per hour for a CAS engine. The same electricity bill applies to steak-thick-meat. Harmonic systems installed in storage freezers are also inexpensive, and cost only about ¥150 per day for 330 square meters.

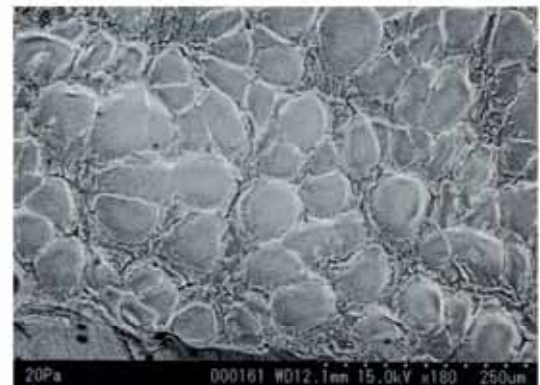
By retrofitting CAS engine to the quick freezer, it freezes without gathering water molecules so that it does not damage the cell membrane.

CAS ENGINE (CAS ENGINE)

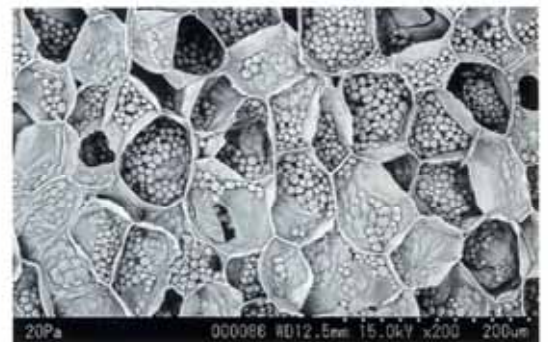
Retrofitting it to existing -40°C -enabled quick freezer



CAS engine does not destroy the sardine cells



Wasabi cells are not destroyed when using CAS engine



* Flavor and pungency are the same as fresh

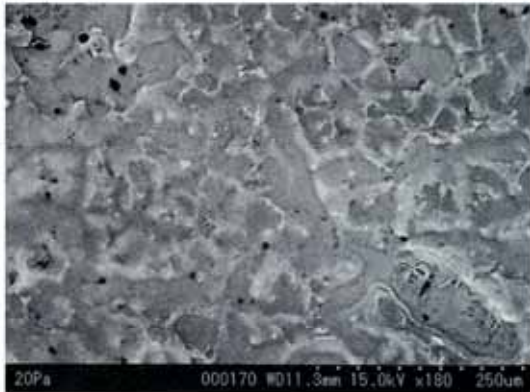
* Combining the CAS engine with a quick freezer keeps the cell membrane and cell walls intact, keeping the fresh ingredients delicious and Taste.

After thawing, the yield rate is high and it can be as close to raw as possible.

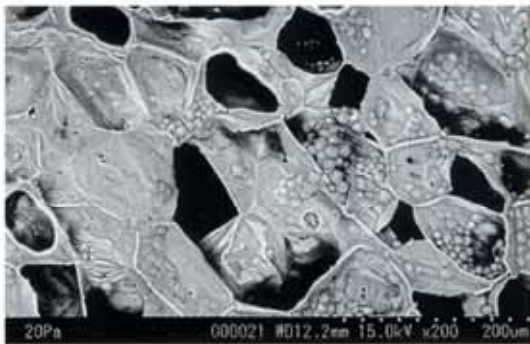
Existing quick freezers gather water molecules and form ice crystals, destroying cell membranes.

Existing -40°C quick freezer

Quick freezing destroys sardine cells

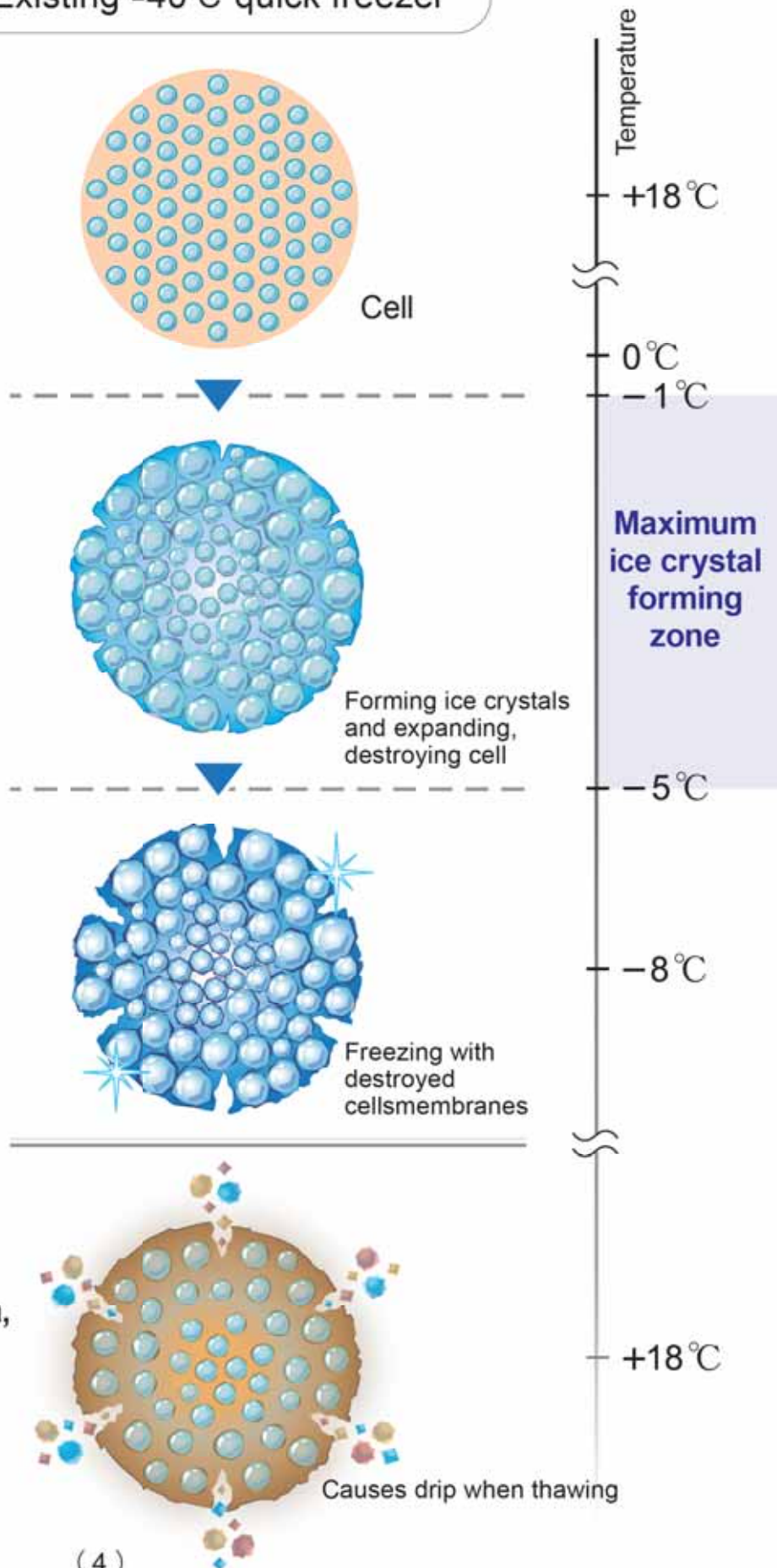


Quick freezing destroys wasabi cells



* Lose flavor and pungency

* Drips reduce umami, aroma, flavor, color, texture, and yield rate.



***In February 2020,
we, medical researchers,
will start collaborating
with ABI using the medical ABI CAS.***

Center of iPS Cell Research
and application, Kyoto University

Kenji Osafune M.D., Ph.D.



We are developing a method to freeze kidney cells, liver cells and pancreatic cells for regenerative medical care from human iPS cells using medical CAS. The research aims to save patients around the world by transporting these cells both domestically and internationally and performing transplantation at the local hospitals.

ABI's CAS is based on the results of collaborative research with the medical field and is being used to develop technology for preserving food freshness.

ABI has collaborated with 38 research institutes in Japan, including the University of Tokyo and Kyoto University, and research institutes in three overseas countries in the medical field, including regenerative medical care. ABI uses the results of this medicine to preserve the food sector. Based on the results of this medical science, we are developing technology that enables long-term storage by retrofitting our harmonic system, which was developed for reviving cell tissues and storing cells for a long period of time.

Until now, in the fields of medical, organ preservation and iPS cell freezing, nitrogen freezing, alcohol freezing, and quick freezing at minus 90°C has been common, and it has been difficult to obtain prospected results. However, by retrofitting CAS to a medical quick-freezing device, the cell viability, which was in the 20% range up to that point, has been dramatically increased to 70~80%. ABI will continue to develop technologies that aim to achieve a 100% survival rate using CAS in consideration of patients.

● Research in which Norio Owada participated

No.	Author	pub.	Title	Magazine	Collecting Library	Reference information URL
1	Norio OWADA	1998	Confectionery Freezing with Electric Vibration for Water Molecules	The refrigeration 73:875-880	Engineering Bldg.2 Library, the University of Tokyo	https://ci.nii.ac.jp/naid/10003778141 
2	Norio OWADA	2001	Evolution of freezing technology--the difference in the flavor of tuna, meat, chicken, and vegetables	Food industry 44:43-50	University Library for Agricultural and Life Sciences, the University of Tokyo	https://ci.nii.ac.jp/naid/40001847593 
3	Norio OWADA	2004	CAS Freezing and Harmonic Oscillating Storage System for Revolution of Low-Temperature Distribution (feature: The latest manufacturing technology for high-functional food)	Chemical equipment 46:75-78	Engineering Bldg.5 Library, the University of Tokyo	https://ci.nii.ac.jp/naid/40006226879 
4	Norio OWADA	2005	The future of Japanese fisheries business through CAS freezing system (feature: Tips for keeping freshness technology -What can we do from fishing to fork)	Cultivation 42:29-31	Hokkaido University Graduate School of Fisheries Sciences Library, Faculty of Fisheries Sciences	https://ci.nii.ac.jp/naid/40006688551 
5	Norio OWADA	2005	"Freshest taste" despite frozen food - Practical use of revolutionary CAS technology that allows you to taste "in season" anytime with the power of magnetism. Towards application in the medical field (feature: Challenge for innovation that creates new value in society)	Infinity 118:26-30	Sapporo University Library	https://ci.nii.ac.jp/naid/40007074788 
6	Shiho KYOUNO Kouichi KYOUNO Shinichiro NAKAMURA Norio OWADA Kazuhiro FUJII Masanori HATORI Hironori OKADA Nobuhiro SHIMOZAWA Tadashi SANKAI	2006	Novel method of cryopreservation of the organs from cynomolgus monkeys	Primate research Supplement 22:88-89	J-STAGE	https://ci.nii.ac.jp/naid/130006996905 
7	Norio OWADA	2006	Possibility of CAS, Deliver fresh agricultural and fishery products of the island to consumer.	Island 51:92-97	Science Library, the University of Tokyo	https://ci.nii.ac.jp/naid/40007143377 
8	Norio OWADA Hitoshi NOGUCHI	2007	A new era of front runners (No.2) President of ABI, Norio Owada: Pursuing dreams with "CAS technology" that freeze and thaw while retaining the flavor.	Forbes 16:144-148	University of Toyoma Library	https://ci.nii.ac.jp/naid/40015398654 
9	Mie Maganuma	2009	Management professional, Norio Owada the president of ABI, Family quarrel and many complaints ... overcoming hardships and take opportunities.	Nikkei Top Leader 297:32-37	Nikkei BP	https://ci.nii.ac.jp/naid/140000284315 
10	Norio OWADA	2009	CAS Function Freezing System Technology for Primary Industries and Revitalization of Depopulated Areas (feature: Sterilization, Satellite and Artifact Prevention Technologies in Food Manufacturing)	Chemical Device 51:55-60	Engineering Bldg.5 Library, the University of Tokyo	https://ci.nii.ac.jp/naid/40016674307 
11	Norio OWADA	2009	CAS technique that enables foodstuffs to retain their freshness after long term refrigerated storage	Food packaging 40:50-54	National Diet Library, Japan	https://ci.nii.ac.jp/naid/40016604771 
12	Tadashi SANKAI Norio OWADA Kouichi KYOUNO	2010	Cryopreservation of the Ovary	Journal of mammalian ova research 27:101-105	JASI	https://ci.nii.ac.jp/naid/10027594983 
13	Norio OWADA	2010	Freezing system technology with CAS function and the equipment	Food technology journal 6:35-42	Graduate School/Faculty of Agriculture Library,	https://ci.nii.ac.jp/naid/40016981712 
14	Norio OWADA	2010	Dream food freezing technology "CAS" (feature: Casting off - Tips through tunnels in recession)	Chubu 19-22 Figure at beginning of the book Page1	University of Toyoma Library	https://ci.nii.ac.jp/naid/40017002960 

Please refer to the bibliographic information URL for medical papers. For inquiries, please contact US.

CAS certificate and CAS mark

The culinary industry and food processing manufacturers in Japan and major countries around the world say that freezing food using CAS freezer "revive after thawing." This phrase was first mentioned by MOF (Meilleur Ouvrier de France / Best worker in France) chefs.

As a theme for the primary industries of fisheries, agriculture, livestock and the culinary industry to deliver the deliciousness to consumers, this CAS mark is now attached, as a proof of confidence in each industry that CAS can revive food stuff when thawed.

This CAS mark came to be attached in the world.

Farming



Fishery



Vegetables

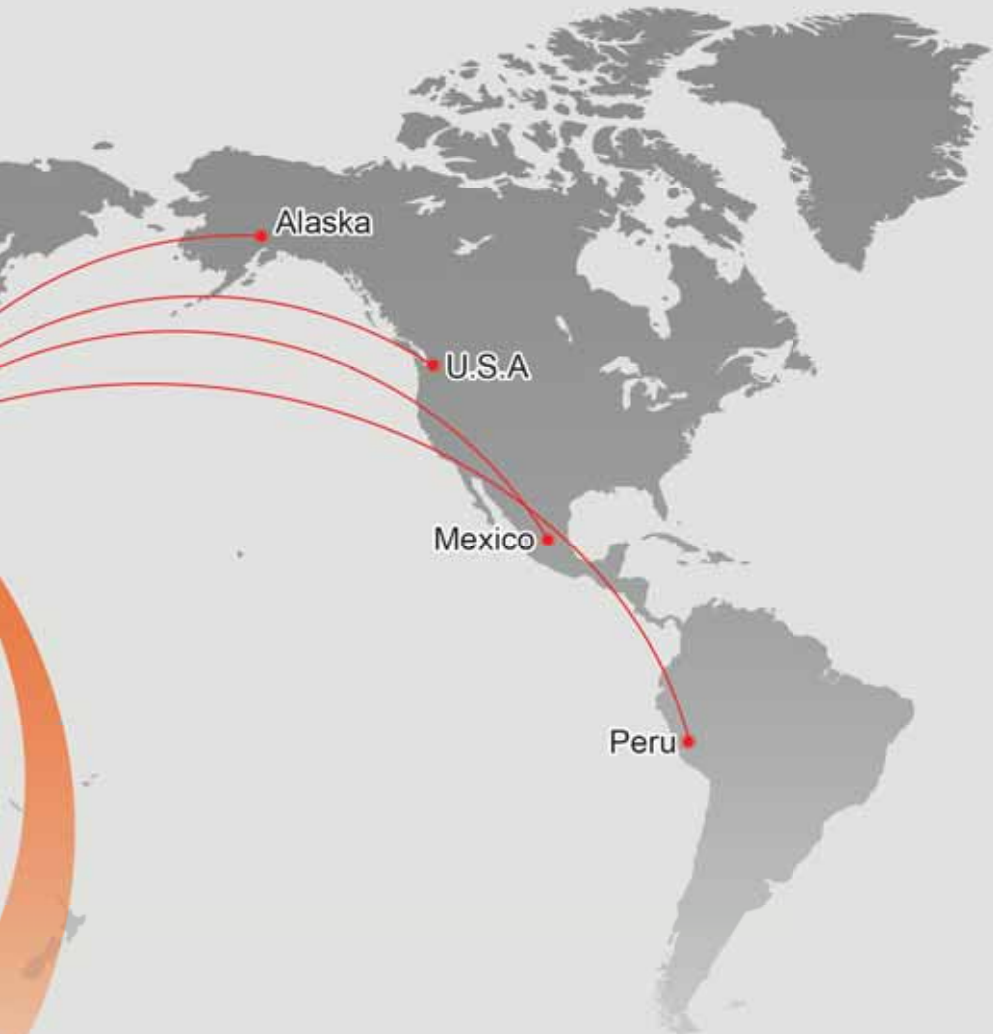


 **ABI CO.,LTD.**
www.abi-net.co.jp



We received many inquiries about applying to CAS logo to be attached on the products of the CAS users in and out of Japan. ABI makes much of safety criteria in Food process industries, referring to opinions of culinary fields. Once CAS certification is issued, automatically the CAS user will become a member of CAS association. ABI will provide CAS mark in each field.

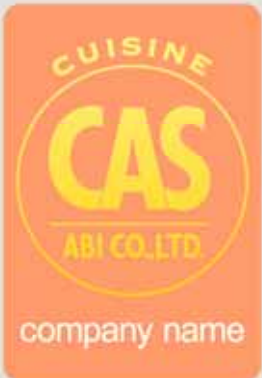
Since there is time limitation on CAS mark like 3 years, or 5 years. ABI will update on each expiry year for the purpose of safety management.



Fruits



Dairy



Cuisine



Confectionery



50 years as children's smiles overlap with time / Norio Owada

For 50 years since I was 26, I have been supporting many disable children to become independent. Using CAS, we are promoting food supply and technology development pursuing beauty with these children.

Ms. Sadako Yamazaki, a director of a welfare facility "Cosmos Work Shop" in Wakayama pref., worried about the future of disable children after their parents pass away and hoped that they would be able to live independently on their occupations. I was deeply sympathetic to her way of thinking and put my most effort to cooperate with her.

At present, the Cosmos Factory has developed a product that can be eaten immediately if it is thawed, and can be eaten immediately when warmed, mainly from agricultural and marine products. It is highly appreciated by hotels and restaurants, because they are very easy to use. CAS is playing a major role by creating a place in which they are able to work by product development and processing and sales of prepared ingredients.

The income of disable people in welfare facilities in Japan is quite limited. However, the income of children at the Cosmos Workshop is eight to nine times higher than the average welfare facility in Japan.

ABI will continue to support disable children to achieve a fully self-reliant and society with a smile and work to increase the number of such facilities throughout this country.



Director
Mrs. Sadako Yamazaki



The disable children are working hard with the careful preparation skills needed to reproduce the taste of traditional cuisine.



Freezing locally caught red legs shrimp using quick freezer with CAS engine



Freezing raw whitebait landed in Yuasa Bay in Wakayama Pref. using quick freezer with CAS engine.



Fresh red legs shrimp after thawing



Raw whitebait with higher yield rate after thawing

The electricity cost of the CAS engine of the quick freezer used at the Cosmos workshop in Wakayama Pref. costs only 2 yen per hour. The quick freezer uses a 10-horsepower compressor, and the cost of electricity is 97 yen per hour for 100kg.

Fresh red legs shrimp and raw whitebait are frozen by the children of the cosmos workshop using the CAS engine. Red legs shrimp gets weaken as soon as they are landed and have been difficult to distribute until now. By using CAS engine, they return to the quality which is just harvested, and are highly appreciated freshness by well-known hotel and restaurant. The order is increasing in popularity.

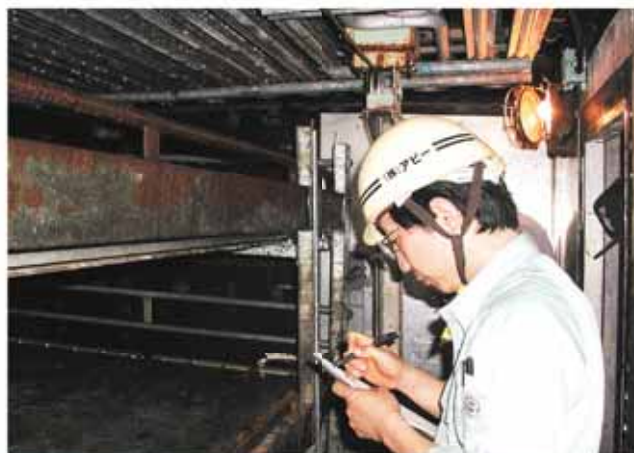
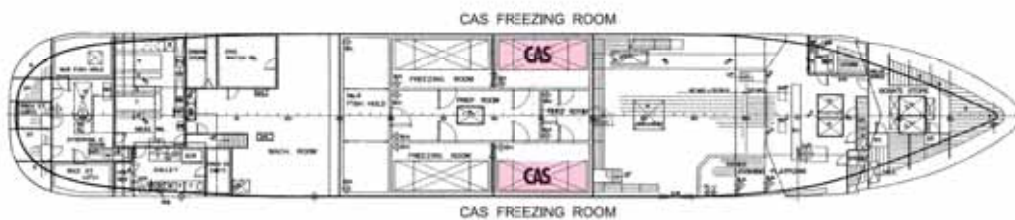




No.29 Homaremaru (a tuna boat) Mr. Hiroaki Yamashita, Chief of Fisheries

We haul in catch of southern bluefin tuna off the coast of Sydney and bigeye tuna off the eastern Pacific Ocean. When live tuna is frozen using the CAS engine, it will return to its raw texture, color and taste when thawed. Please try it by all means.

I had a CAS engine installed to an existing quick-freezer. As a result, the freshness of the tuna became very good, and it was as fresh and delicious as the raw tuna.



The electricity cost of the CAS engine is only 12 yen per room/hour and only 288 yen per 24 hours a day, and the colors (of ingredients) are beautiful, the yield rate is high, and it greatly contributes to profits.



Tuna auction at Tokyo Tsukiji Market



CAS冷バチ1万1000円の高値

16日 築地市場に初上場

高知県の遠洋マグロ延縄漁船・第七北斗丸がアビールのCAS凍結システムで凍結したメバチマグロ、クロマグロが16日、築地市場のセリにかけられ、メバチマグロがキロ1万1000円でセリ落

とされた。

遠洋マグロ延縄船では

現在、3隻がCAS凍結システムを備えている。いずれもアビールの大和田社長が日本の遠洋マグロ漁業発展のため自費を投じて搭載したもの。この日セリにかけられたマグロは、第七北斗丸が北海道沖で漁獲しCAS凍結

した。2本のうち、メバチマグロ(70kg)は品質、凍結状態ともよく、最近の冷バチの上値キロ5500~5000円の2倍の1万1000円で仲卸の大変がセリ落とした。一方、クロマグロ(165kg)は脂のりが悪くセリ前の予想ではキロ2000円程度とみられていたが、4000円でセリ落とされた。

Daily Minato September 16, 2005

High Price of ¥11,000/kg bidden at Tsukiji Market in Tokyo to CAS Frozen Big eye Tuna

No.7 HOKUTO-MARU, a long liner Pelagic Tuna Boat have caught Big eye Tuna (70kg) frozen on board by CAS was tendered in Tsukijiji Market on 16th and was bidden as high as ¥11,000/kg.

This was the first boat among three installed CAS Freezing System of ABI on board. "CAS" logo was labeled on the tuna body.



CAS technology is indispensable for distribution of farmed tuna

Mr. Rikio Katsumada

Former Senior Managing Director of OK Store

Now, the catch of natural seafood is decreasing not only in Japan but also overseas. In addition, the safety of parasites such as Anisakis has become a problem.

The demand for raw aquaculture seafood has increased. In aquaculture, tuna production is expanding and consumption of yellowtail, amberjack and red-sea-bream is expanding. Today, in Japan and the world, the culture of eating sashimi has begun to spread from the sushi culture, and we are entering an era in which we are responding to request for its taste and freshness.

However, farmed fish are softer than natural one, and there is a risk that the longer the transportation distance in fresh distribution, the more problems will occur. I asked President Owada to help with the experiment of farmed tuna at a university in order to improve the quality of cultured fish at the distribution stage. It is an experiment for research whether that farmed tuna cryopreserved and distributed using a CAS engine returns to a raw state when thawed at home. And he eventually cooperated.

As a result of the experiment, the difference was obvious, and the farmed tuna frozen by the CAS engine was almost same as raw even if thawed and tasted. Also, there was a clear difference in quality from conventional frozen tuna. The logistics was also stable, indicating that high-quality cultured tuna can be delivered to consumers at a stable price throughout the year.



As a result of a freezing experiment with CAS engine installed to a quick freezer, the electricity cost to freeze 100 kg farmed tuna to core temperature -55 degree in 24 hours was 48 yen only for CAS, and Electricity cost for the quick freezer was 5,040 yen.





Mr. Kazushi Okuda, President

Furusato Ama Co., Ltd. Shimane Pref. / Ama-cho

In Ama-cho, Shimane Prefecture, natural white squid and cultured rock oysters are processed and sold in domestic and overseas. Currently, harvest amount of white squid has been reducing for more than six months. Even in such situation, we have installed a quick-freezer equipped with ABI's CAS engine and a freezer storage with a harmonic device for preservation, and we can deliver customers the same freshness as ocean-fresh when thawed.

On a remote island, the CAS engine and the harmonic freezing stocker are absolutely essential and indispensable.





White squids are frozen quickly using CAS engine in the factory



External view of freezing stocker with Harmonic Oscillating system

Indoor freezing stocker with Harmonic Oscillating system



We could start business only after preserving in the freezing stocker equipped with ABI's Harmonic Oscillating system

Mr. Makio Matsuoka, Chairman of the Board Yusu Fishery Cooperative Association



We introduced ABI's Dielectric CAS in 2000 in the hope of having consumers in Tokyo eat very beautiful sea fish from Yusu in Uwajima, Shikoku. Dielectric CAS was the most advanced technology in Japan at the time. Later, a new machine called CAS was developed, and our functions were upgraded to CAS in 2011.

At present, we have developed products which can be eaten as soon as they are thawed such as red-sea-bream, young yellowtail, yellowtail and noble-scallop which can be caught in Yusu. And we can now deliver the ocean-fresh taste of the sea of Yusu to people anywhere in Japan.





Uwajima, Shikoku

Yusu
Seafood

海幸

Seafood Catalog & Recipe



CAS can
show the difference
when thawed.

CAS engine learned from nature

CAS
Technology of ABI

Cells Alive System is a
technology that revives cells.

By combining the quick freezer device with a CAS device and freezing, the freshness, texture, deliciousness, color, etc. of the ingredients that used to be damaged by the conventional freezing technology can be preserved and reproduced in fresh taste.

The fishing grounds for Yusu extended under the "Yusu Minaniura Terraced Field" which has been selected as an important cultural landscape of Japan, and fished such as red-sea-bream and young yellowtail are raised with sincerity there. We will deliver these fishes to everyone as "Recommendation of Uwajima City".

Because of processed finely and frozen by CAS, you can cook them easily after thawing anytime like the recipe of inside page, and you can enjoy the deliciousness.

Yusu

Uwakai Sea

CAS[®]

CELLS ALIVE SYSTEM

**Yobuko squid can be eaten
deliciously worldwide.**



Quick freezer with CAS engine



JF Saga Genkai Fishing Cooperative
Yobuko CAS Center
YOBUKO CELLS ALIVE SYSTEM CENTER

Keep just-caught freshness intact **CAS** freezing

CAS (Cells Alive System) means "the cells are alive". The technology was given this name because cells are not broken down even when food is frozen and its freshness springs back to life after it is thawed. Unlike conventional freezing methods, which freeze food gradually, CAS cools food in a magnetic environment that imparts faint energy to freeze food instantly by pulsating the water molecules inside its cells. Because it freezes the food as a whole at the same time, it does not damage the cells. CAS is next-generation freezing technology that also continues to be applied in medical areas such as tooth-banks, etc.



Keep just-caught freshness and umami flavor intact

Conventional freezing methods mean expiry dates of half-a-year to a year. Freshness declines irreversibly after freezing too. However, with CAS, long-term expiry dates up to a maximum of 5 years are possible. Because of this, it is possible to reproduce "delicious seasonal flavors" that utilize food cells. CAS enables the reproduction of umami flavor components after thawing, which was not possible with conventional freezing and can maintain a certain degree of freshness after thawing too.



Stable prices and inventories that are not affected by the seasons or fish catches

The prices and inventories of general circulating fish fluctuate greatly depending on the season and the size of the catch at that time. However, with CAS technology, which enable long-term storage of seasonal fish, both prices and inventories will stabilize. Both menus and standards and easy to determine so quick PR is also possible.



Now at the sea of Sanriku, extraordinary situation is occurring like less harvest of the fish which used to be very much harvested, and harvest of the fish which used to be very rarely caught.

Using the quick freezer with ABI's CAS engine and the freezing stocker with ABI's Harmonic Oscillating system, it can be stored for a couple of years, and if thawed it will be are reproduced ocean-fresh color and deliciousness.

I really feel the importance of preservable freezing storage.



The days when saury can be harvested in large quantities as in the past are over. Every year, popular reasonable fish are becoming high-end fish. I have experienced firsthand that fishers should be frozen by CAS to preserve fish when they are caught and sell them to consumers at a stable price.



Quick freezer with CAS engine to help fisheries and processors of fishery products



Saury sashimi frozen by quick freezers with ABI's CAS engine is reputed to be very delicious.



Mackerel, a beautiful sashimi without discoloration.



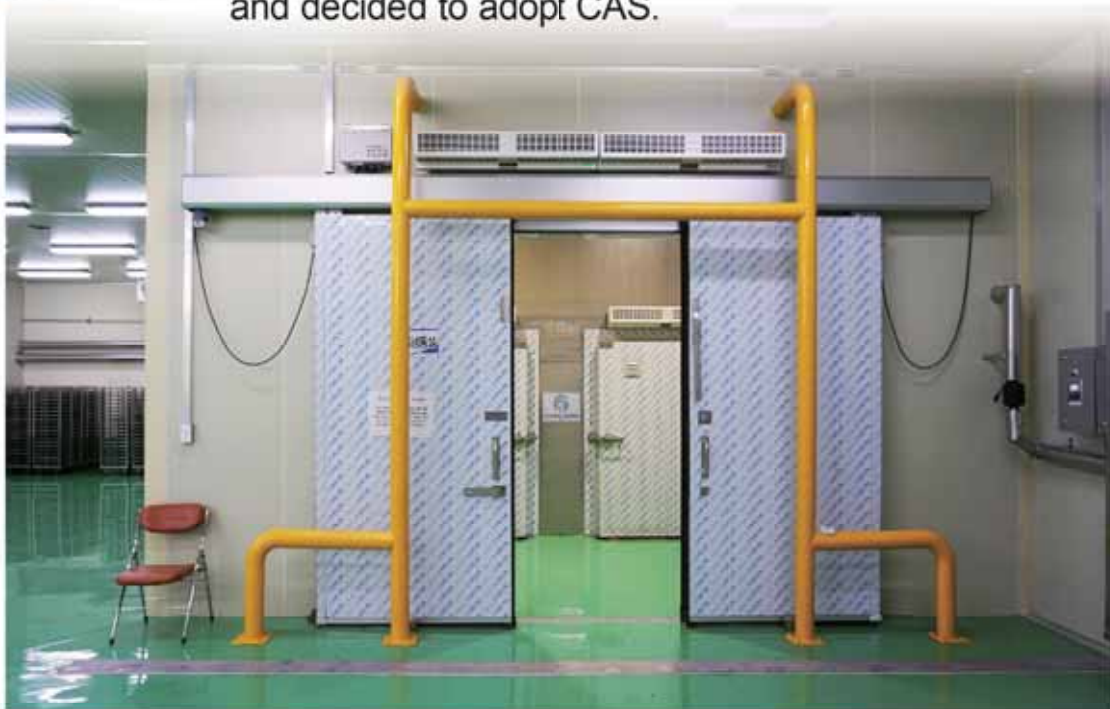
Freezing stocker with Harmonic Oscillating system to help fisheries and processors of fishery products.



**Mr. S.M. Kim, Union president
Nanhae-gun Fisheries Cooperative Association,
South Korea**

I've been experimenting with ABI in Japan five years ago and have been asking questions. I checked the food stored for one year with my own tongue spending 6 months..

My union built a processing plant in August 2019. At that time, the members of the Fisheries Association ate the thawed CAS ingredients and were convinced of the taste, and decided to adopt CAS.



Quick Freezer with CAS engine retrofitted



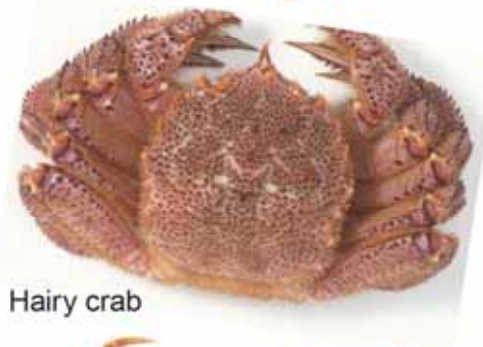
Ingredients such as hairtails, oysters, mackerel and spanish mackerel caught in the most cleanest sea in Korea (the sea where the U.S. FDA has permitted the import of raw oysters) were frozen by CAS and thawed, then sliced into sashimi and served at the completion ceremony. The fisheries cooperatives of nationwide who ate acclaimed for those freshness said that they have to spread it nationwide.



When the CAS engine is combined with an existing quick freezer, crustaceans such as shrimps and crabs do not become thinner after thawing, and deliciousness, flavor and texture return to a fresh state. This is welcomed and widely used by chefs.



King crab



Hairy crab



Snow crab



Spot Prawns



The high quality after thawing revives outstanding freshness and deliciousness even sliced into sashimi.



Quick freezer with CAS engine



Freezing stocker
with Harmonic Oscillating system



Thawed-autumn salmon after being stored in the freezing stocker with harmonic oscillating function for 3 years. The internal organs are not melted when thawed. Fishermen say that the salmon roe is no different from raw.



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