



ΜΑΥΕΚΑΨΑ
MYCOM

Our Vision and Philosophy



Mayekawa and the World to Come

We are living in a world where gradual but essential changes of the economic structure are driven by mass production, sales and consumption which were once mainstream in the 20th century. In the 21st century, thus, we must address the realization of a materially and spiritually richer society in which people always want to have by taking a different approach.

Rapid and drastic growth of machine technology in the 20th century, contributing to an increase in variety and quantity of goods as well as in speed. We are aware, however, that these technological benefits alone will not always sufficiently satisfy present conditions.

Having acquired quantity and speed, people are seeking quality and ease. In the workplace, we are required to concentrate on what only people can do, making full use of machinery. After achieving "quantity" and "speed" targets, people have started to turn their eyes toward "quality" and "humanity." This also applies to the workplace, and now what are needed are jobs that enable people to fully use their "human" abilities and skills while letting machines do what machines can do best.

Even in the 21st century, we still have such unsolved challenges as environmental and energy issues including global warming as well as concerns regarding resources and food.

Having driven the development of machine technology as a manufacturer throughout its history, Mayekawa believes it should assume responsibility for continuously addressing the comprehensive range of these challenges we face as part of the human community in the 21st century.

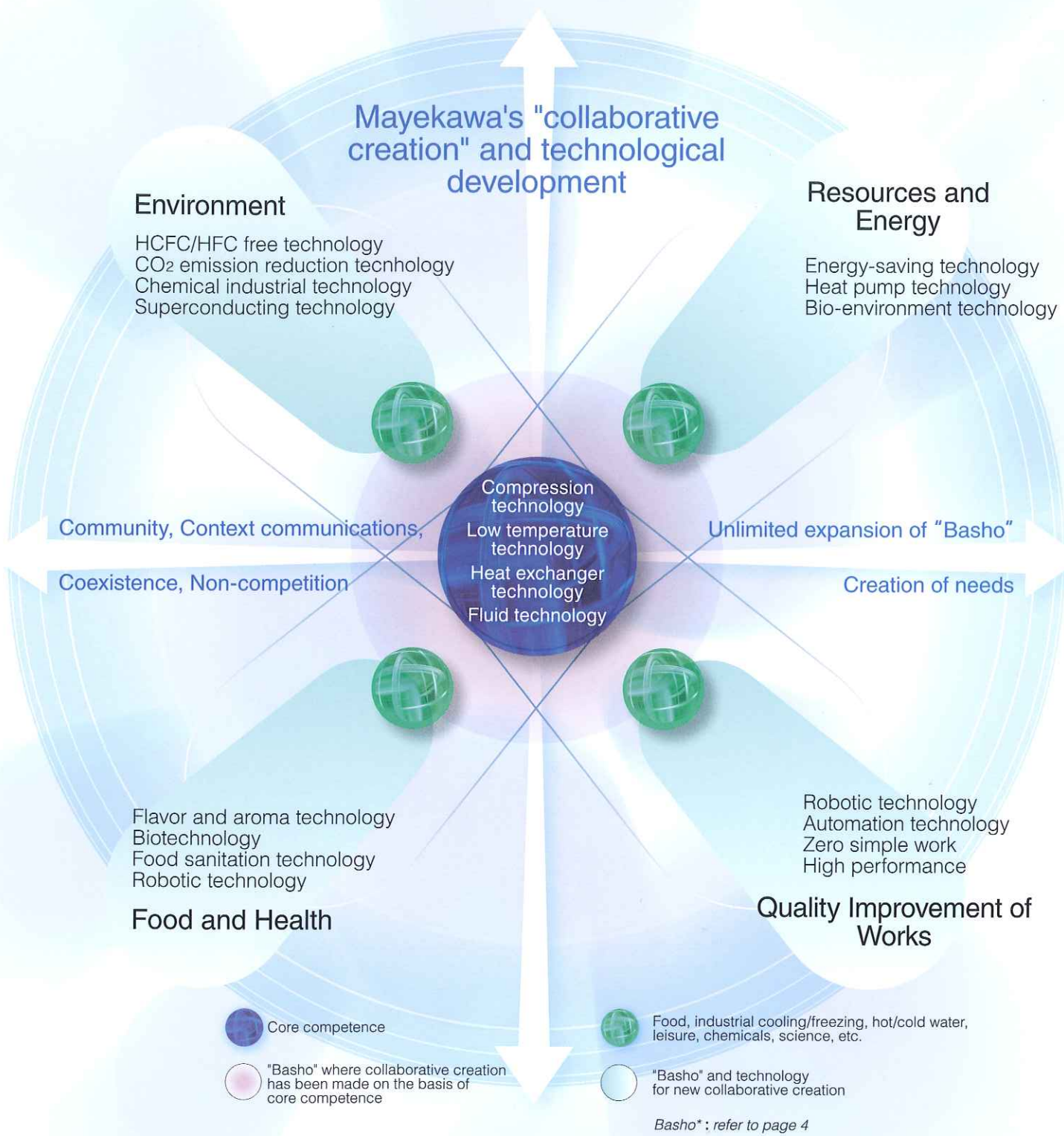
Addressing the following four categories of challenges is the key to meeting this goal:

- 1. Environment**
- 2. Resources and Energy**
- 3. Food and Health**
- 4. Quality Improvement of Works**

Ever since its foundation in 1924, Mayekawa has always identified itself in the context of the "environment that enables the company to operate." By promoting collaborative creation with elements constituting the environment, Mayekawa has solved many problems and in turn developed itself.

Mayekawa is committed to contributing to the 21st century human society and to promoting further development and growth by maintaining this stance.

Mayekawa's "collaborative creation" and technological development



We started our business with ice manufacturing and cold storage and have changed ourselves since by developing food freezing technology and adapting ourselves to changes in markets. In order to meet the needs of the times, we have improved compressor development and production technologies by always collaborating with customers. Further, we have expanded our operations in to the chemicals industry, superconducting technology and other new fields, working together with parties concerned with developing new compressors, and, by taking advantage of ultra low temperature compressors created through the process, we are able to make ambitious and cutting-edge proposals for the industrial freezing and refrigeration market.

At the same time, we have developed a comprehensive range of technology including robot, bio and environmental technologies through creating "Basho," our vision of the 21st century is thus to propose these technologies to new "Basho" and thereby to further advance our core technologies.

Developing "uniqueness" through collaboration



No life can exist independently, and all animals and plants live by forming a life cycle where they are related with each other as well as many other things.

Mayekawa considers that a company is also a living thing.

We operate in a place where the individual divisions of "engineering", "production", and "sales" are connected by such factors as "customers", "customers' markets", and "environment of our time" in an organic manner. It is important to carry out context communications and share different "senses" of each party in place. Based on this approach and in pursuit of our identity, we can create something unique to us. That is our "uniqueness" exclusive to us, enabling us to lead a life without competing with others. In this way, we have established our way of coexistence.

Mayekawa is no longer just a compressor manufacturer; it has evolved into a company having such mutually related functions as engineering, service, consulting and distribution. The fields of operations by Mayekawa have expanded to freezing/refrigeration business to general food and chemical industries, and the company has developed a group of "unique" people who can flexibly respond to and promote exchanges with any fields requiring low temperature, energy-saving, environmental and automation technologies.

A group of people who can identify themselves in the context of the "Basho" that enables them to live and act and strengthen their abilities to solve problems through collaborative efforts and creativity. This is where Mayekawa's main strength is found.

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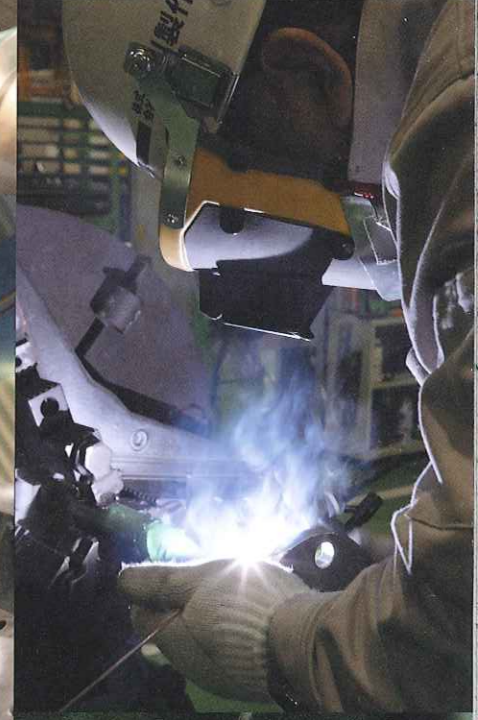
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*Basho**: Basho could be translated as the living sphere which represents comprehensiveness of our surroundings. We also call Mayekawa's unique concept of problem solving "Basho" where all members of a team face each other and reset and reexamine his/her stance anew by observing with an open mind, while understanding one's role within the group.

Food & Meat market 1

Freezing and related technology



We are committed to five requirements of taste, assurance, safety, price competitiveness, and stability in collaboration with customers.

Food is essential to people's lives. Under the strict watch of society toward this field, not even minor mistakes will be allowed. Mayekawa's corporate strength has been established in such a demanding field.

The requirements of the taste of foods and beverages, assurance, safety and stability differ delicately from nation or region. Therefore we have to extract an original challenge in each work site, creating individual solutions.

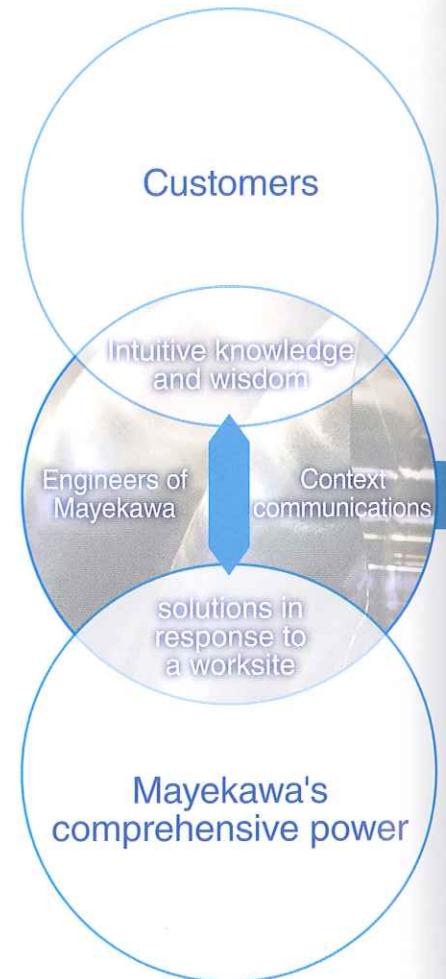
In order to obtain the solution we share experiences and knowledge at worksites with customers, create a fusion of accumulated knowledge and skills, and repeat "context communications" many times.

In manufacturing foods and beverages there are four categories, 1. manufacturing equipment, 2. raw materials, 3. processing methods and 4. heat. We have built collaborative relations with customers on the basis of our core technologies in thermal engineering.

Low temperature technology significantly affects flavor, quality and taste of foods. Mayekawa has excellent credentials for thermal engineering over eighty years and making full use of its unique engineering based on the expertise of the relations between foods and heat, we build up the optimum cooling system for individual customer's preference.

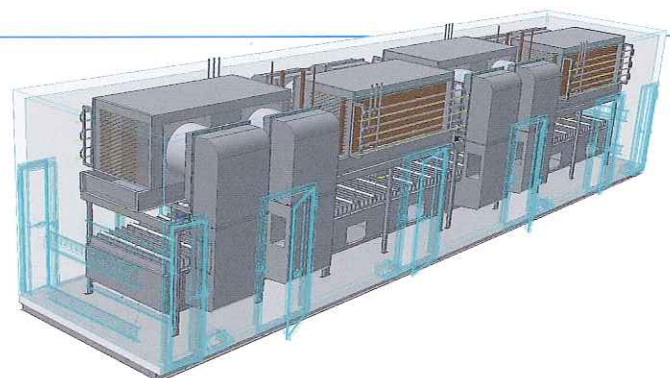
The optimum control of "heat" is required to all manufacturing processes of foods and beverages. We sincerely understand what is required and turning up in individual process and operation through committing "heat", on that basis we extract new challenges, provide new solutions and make efforts to contribute to our customers.

In addition to cooling systems for foods we develop other equipment including foreign matter detectors and quantitative autofillers in response to needs of particular process and operation.



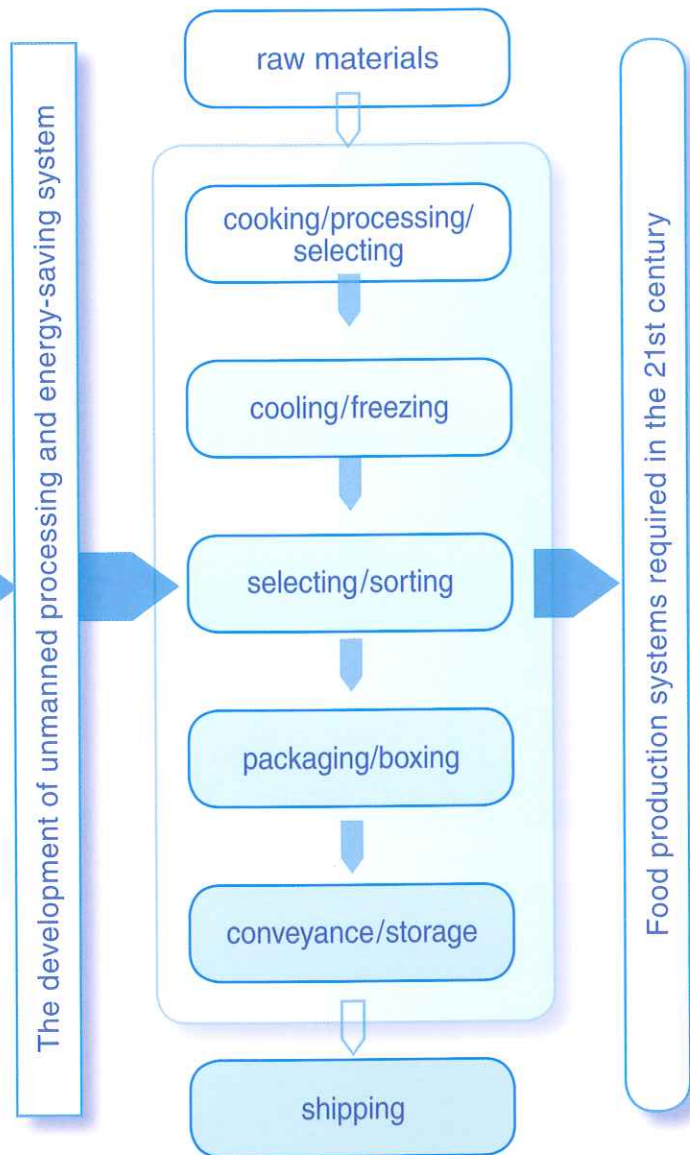
● Cooling technology to keep food quality

1. Scallop freezing



The quality of scallops as food is significantly affected by the cooling method. Just rapid freezing not guarantee customer satisfaction the shape and color of scallops must also be maintained. Especially the whiteness of scallops in freezing is the conclusive factor to decide the added value of products. Mayekawa performed freezing experiments on this delicate food, confirmed its quality together with customers and developed a special freezer dedicated for scallops.

Food processing systems in the 21st century demand enhancing "thermal control", "machine technology" and "traceability", guarantee a high standard of taste and safety, maintain safety and security at workplaces reduce total cost. In order to design and build such systems, Mayekawa's machines and equipment emulate human hands, eyes and judgment (as if they were skilled workers).



Thermo Jack Freezer

Blowing air directly onto products from small slits reduces the freezing time to one third shorter than conventional blowing from freezing fans. At the same time Thermo Jack Freezers can maintain the freshness of products. It is the most important pillar for manufacturing freezers to keep the quality of products by carrying out optimum freezing.



Supercooling chiller

Mayekawa has the technology to provide a lot of chilled water at 0°C and makes use of the water for cooling foods. Chilled water makes vegetables crispy, adds chewiness to Japanese white noodles and extends the expiration dates of products. The chiller effectively makes water of 0°C by using special technology which makes ice by giving shocks to chilled water of below 0°C. It is not an energy consuming method which melts ice and gets chilled water.

Foreign matter detector

"Even small objects can be detected by this machine!" This is one example of feedback from customers at a trade show.

As a demonstration the machine rejected the cooked product with a tiny foreign matter such as broken lead of mechanical pencil.

"We need a machine which can detect even the smallest amount of dirt."

Foreign matter detector was developed based on this requirement and plays a key role in detecting foreign matters lying in Japanese white noodles and rice.



● Cooling technology to keep food quality 2. Meat cooling

In the case of cooling a huge amount of pork under the same conditions Mayekawa delivers the optimum freezers using various cooling methods such as cooling equally in a huge room, cooling without weight loss and cooling bulk meat rapidly through customer collaboration. We realize individually dedicated cooling method for small and large size food without deteriorating their quality.

Food & Meat market-2 The development of meat processing robot

We have developed various kinds of mechanical systems besides cooling systems, collaborating with customers in food and meat industries.

As an example of such developments we are promoting "robots which contribute to creating high added value and its consistent systems" in the meat processing field.

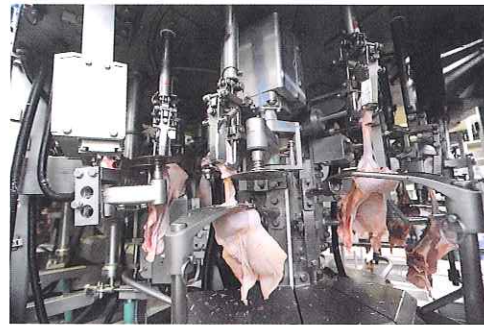
Meat processing robots require delicate skills like perceiving the subjects which individually have subtle differences. First we develop the robot in each process, then realize the laborsaving systems in response to various kinds of product appearances, provide high quality and produce high yield under the low temperature.

We have been developing the automation system for the deboning process which is the highest challenge and the commercialization of related systems in collaboration with customers. The leading products are the integrated systems including TORIDAS, YIELDAS and HALVIDAS in the poultry market and the hanging deboning system including HAMDAS-R and WANDAS in the poultry market.

New Chicken whole leg deboning robot TORIDAS MARK II and loading system



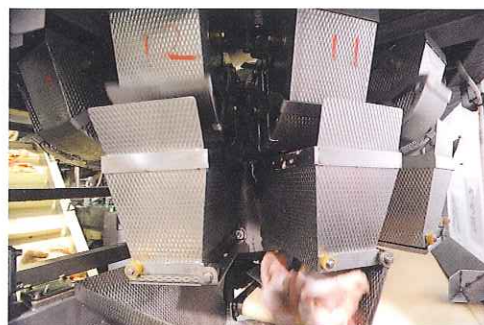
Whole leg loading machine



TORIDAS



Whole leg loading machine



Automatic weighing robot

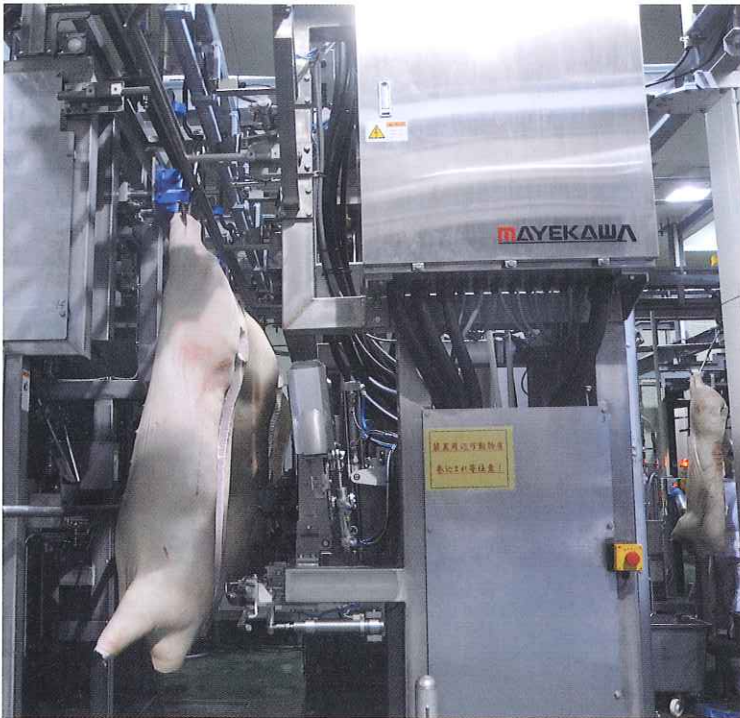
● Chicken processing robot "TORIDAS" as a collaborative product

Mayekawa developed the chicken processing robot first in Japan. In 1994 an engineer accepted the development offer of the robot and before he started designing, he mastered manual processing method in order to obtain the idea of development. One year later, the robotic machine finally developed. In fact it took about ten years from the initial start of the development. As a result the number of chicken processed at customer's site per day was dramatically increased in addition laborsaving and space saving was also realized. Development of the robot which can respond to the very nature of the meat was challenging and time consuming, but the knowledge and skills accumulated through this challenging process are now applicable to various other fields.



TORIDAS

**New pork meat processing robot system
(capacity 150 to 200 pigs/day)**



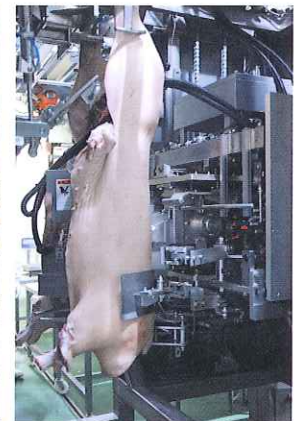
Automated flat bone separation robot



Automated flat bone separation robot



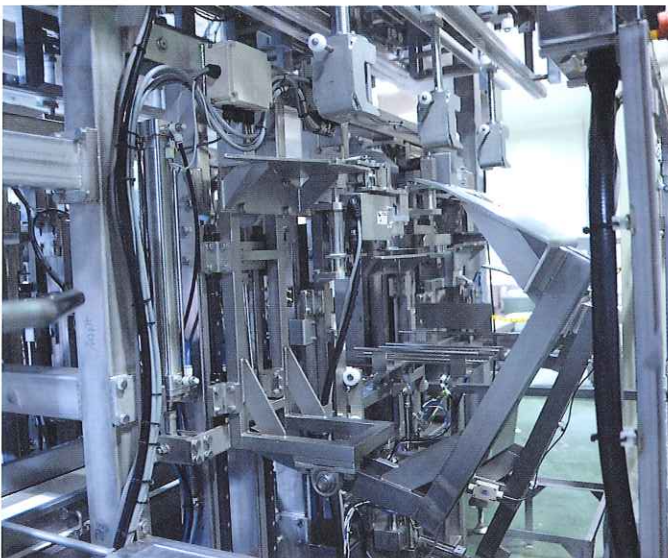
Automated back bone separation robot



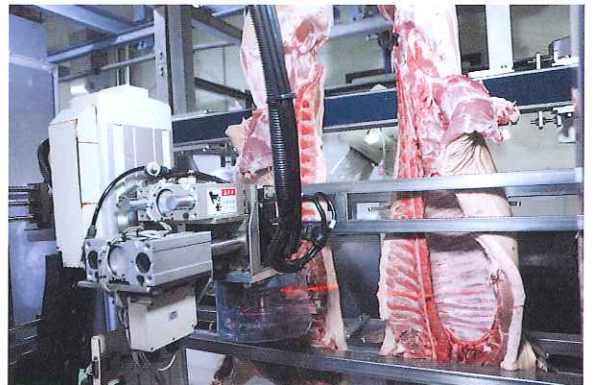
**● Pork meat processing robot as
a collaborative product**

Meat processing sites now face such challenges as 1. A decrease in the number of skilled workers due to an aging society, 2. Long period of time required to develop and train a skilled workforce, and 3. Physical strain/stress on skilled workforce. In order to provide solutions for these challenges we have developed the processing robot over a period of six years.

In collaboration with customers we are aiming at developing robots that come close to the craftsmanship of Japanese artisans.



Automated thigh deboning machine



Primal cutting robot



Automated thigh deboning robot



Automated arm-shoulder deboning robot

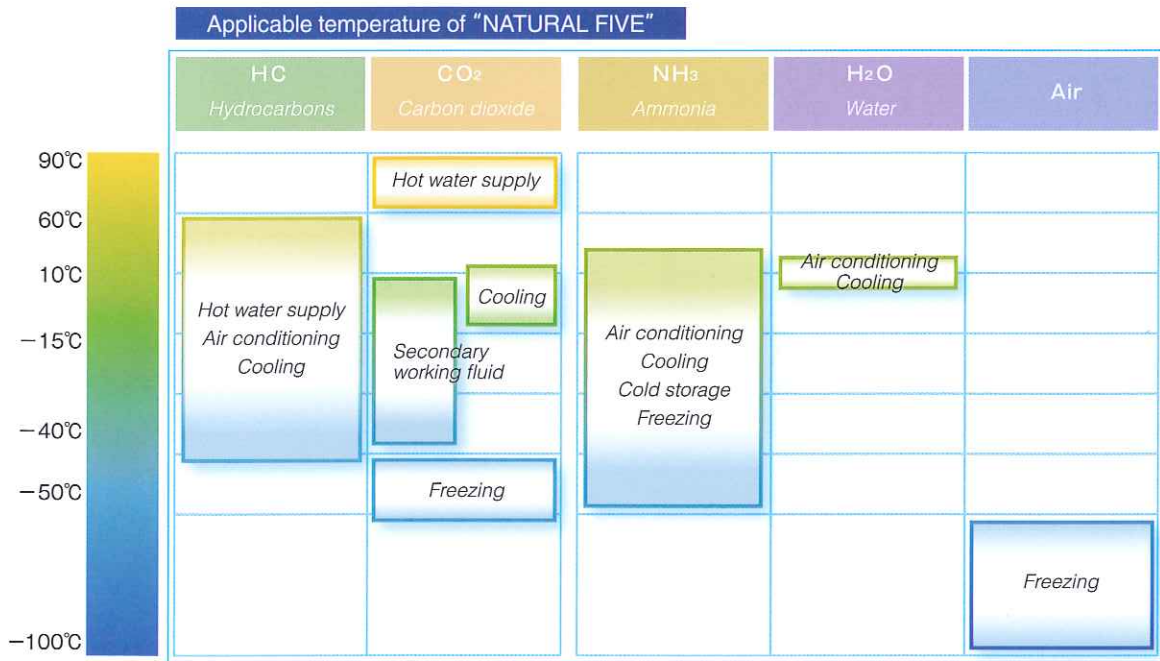
Environment-conscious commitment to Natural Refrigerants



In order to conserve the global environment, the freezing and cooling systems in the 21st century require the realization of HCFC/HFC free products and energy saving. Therefore Mayekawa focuses on five natural refrigerants called "NATURAL FIVE", that is the commitment to technologies using environment-friendly natural refrigerants to protect the Ozone Layer and prevent global warming.

As the control on HCFC and HFC regulation will have been tightened toward 2020. Mayekawa as a manufacturer of cooling and freezing systems, takes responsibility for developing environmentally friendly natural refrigerant technology as well as building up the energy saving systems to help our customers implement these ecology-conscious alternatives.

Five environmentally-friendly Natural Refrigerants applied to Refrigeration, Air Conditioning, Heating and Hot Water Supply



Air

Air cycle refrigeration system "PascalAir" realizes Super-low temperature world.

In 2008 Mayekawa successfully commercialized the air cycle refrigeration system for industrial applications. The system referred to as "PascalAir" uses the ultimate natural working fluid "Air," with no Environmental Impact.

The newly launched air cycle refrigeration system "PascalAir" is the open type refrigeration system, which directly circulates super-low temperature air in storage room as a working fluid. Utilizing the behavior that gas generates heat when compressed and loses heat when expanded, this system creates a super-low temperature world with the temperature range between -50°C and -100°C.

"PascalAir" will be introduced to not only conventional markets including super-low temperature cold store for frozen tuna fish and freeze-drying process, but also other applications such as home appliance recycling plant (freeze-destruction), the semiconductor production process, medical & pharmaceutical, and physics & chemistry.



NH₃
Ammonia

"NewTon3000" realizes CO₂ emission reduction and energy-saving.



In 2008 Mayekawa started a sale of the "NewTon3000", which was designed as the dedicated semi-hermetic refrigeration compressor packaged unit for cold storage application. The combination of the high-efficiency IPM motor dedicatedly developed for the use of Ammonia refrigerant and the high-performance compressor achieved 20% better energy saving results compared to the conventional machine of the company.

This highly safe system uses ammonia as a refrigerant and employs an indirect cooling method that circulates liquefied carbon dioxide within the storage.

If the 13,000 Fluorocarbon compressors in operation in Japan today were replaced with this system, we could reduce CO₂ emissions by 430 thousand tons annually, bringing the equivalent of the energy used by 136,000 households in an entire year.

The "NewTon3000" is easy to replace in existing cold warehouses and its market penetration is highly expected.

HC

Hydrocarbons

Environmentally-friendly energy-saving Air conditioning system

This is a heat pump system for commercial and industrial air conditioning and hot water supply which uses hydrocarbon refrigerants, one of natural refrigerants. The system effectively operates in three modes of "chilled water", "hot water" and "hot water supply," supplying water at temperature of between 7°C and 65°C.

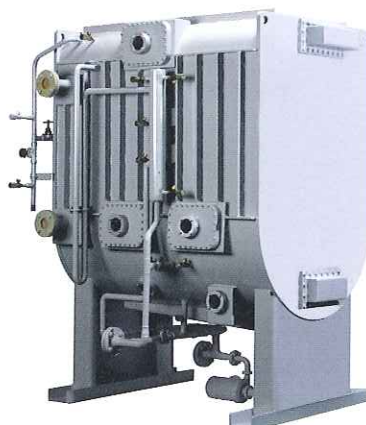
This system was employed as an auxiliary system for air conditioning at the International Media Center (IMC) at G8 Hokkaido Toyako Summit in 2008.



H₂O
Water

Energy saving Adsorption Chiller "AdRef-Noa"

"AdRef-Noa" is a highly efficient chemical refrigerator using water as refrigerant and Zeolite as an adsorbent. It provides chilled water of 5°C to 15°C, making efficient use of renewable energy like solar heat and biomass, and waste heat from engines and low temperature waste water of 60°C to 80°C from factories. It is widely accepted as energy saving equipment which can reduce CO₂ emissions with only a little power required.



CO₂
Carbon dioxide

CO₂ Heat pump "Eco Cute" for Hot water supply

Refer to page 13



Water heat source Eco Cute

Industrial refrigeration field together with Mayekawa's history

Mayekawa started an ice making and cold storage business in 1924, developing both in the domestic and overseas markets based on the design and construction of cooling plants as well as thermal engineering business, establishing customer's trust with the supply of Industrial refrigeration compressors and refrigerated vessels.

In individual field we offer comprehensive services including design, manufacture, construction and after sales services in collaboration with customers while we have been focusing on the prevention of Global Warming and the protection of Ozone Layer from early on.

Taking into consideration the issues of safety, efficiency, energy saving and global environment, we pursue the optimal refrigeration system for foods and beverages which require sensitive handling and the commitment to establishing a system which assures the original quality of production site to the consumer.

● Logistics

Mayekawa offers the unique know-how and expertise acquired through the work places, for example, the cooling system and distribution system which temporarily stores frozen foods from the domestic as well as overseas producers and ship them on request.

Offers from Mayekawa

- Thermoshutter
- LED lighting
- Energy saving and high efficiency refrigeration systems
- Renewal projects of existing refrigerated warehouses
- Refrigeration Compressors applicable for natural refrigerants



PascalAir



NewTon3000



● Seafood processing

Quality of Marine products easily change color and taste due to the method of cooling or freezing. We have long been involved in cooling processing systems around the world. From farm to the table Mayekawa delivers essential various cooling systems reflecting its know-how and expertise.

Offers from Mayekawa



● Seawater ice making systems



● Zone cooling systems in fishery market



● Hygiene control in fish processing plant market

● Fruits and vegetables

Mayekawa's CA equipment (Controlled Atmosphere) and "Super Fresh (highly humidified low temperature cold store)" assure the distribution of fruits and vegetables as fresh as harvested to the consumers throughout the year. Those equipment reduce the breathing and moisture transpiration of fruits and vegetables to keep the freshness by controlling the composition of air in storage rooms and maintaining the condition of low temperature and high humidity (over 95%).



Offers from Mayekawa

- CA equipment (Controlled Atmosphere)
- Super Fresh (high humidity low temperature cold store)
- High-freshness keeping system (for fruits and vegetables)

● Beverages

The production process at beverage plants uses tremendous amounts of both heat and cold energy. Different energy supplying systems are required for individual processes such as the cooling after pasteurization and the cooling of carbonated beverages.

Mayekawa offers the energy supply system for individual production process in consideration of the total optimization at the entire production processes and realizes energy-saving and environment-conscious plants.

At beverage plants lots of water is consumed in the cooling process after the pasteurization process, so reduction of water consumption is also an important issue. We collaborate with customers to build water saving systems using natural refrigerants such as adsorption chillers, taking advantage of the waste heat of pasteurizers effectively.



● Brewery

Every brewery plant is committed to energy saving and reducing CO₂ emissions and Mayekawa has achieved results in this field. For example, in emerging countries centering on Asia, we apply these technologies to Clean Development Mechanism (CDM) projects, introducing energy saving technology.

Offers from Mayekawa



● Carbonated beverages cooling system



● Adsorption chiller



● Modular Ammonia (NH₃) evaporative condenser packages



● Water saving system

Offers from Mayekawa



● Thermal stratification tanks



● Vapor re-compression system (VRC)

● Dairy

The production process of dairy products is required to deliver quality products made of highly-selected raw materials safely and surely to the consumer. At dairy plants Mayekawa collaborates with customers to design production lines from material reception to production & shipment and to implement plant facilities from the viewpoint of "temperature control" and "energy saving." We realize the optimum temperature and conditions in the production processes as well as higher productivity by using our unique technology and expertise.

Offers from Mayekawa

- Continuous Ice cream freezer
- Chilled water supply system



● Supercooled Ice making packaged unit

● Marine

The world trade of frozen and fresh products is expected to grow by nearly 15% to over 200 million tons by 2015, of which approx. 50 % will be transported by sea freight. Mayekawa provides the state-of-the-art refrigeration systems for refrigerated cargo vessels or reefer utilizing technology which assures the highest quality of perishables during seaborne transportation.

For a safe and healthy diet, the world consumption of seafood has been significantly increasing. Responding to this demand we offer environment-conscious and highly energy-efficient refrigeration systems for fishing boats.

Offers from Mayekawa

- Refrigeration system for refrigerated cargo vessels (Reefer)
- On board refrigeration system for fishing boats



High efficiency and environment-friendly heat pumps

Since 1971 Mayekawa has been ahead of the competition in manufacturing large size heat pumps for air conditioning. In 1977 it started its development of high-temperature heat pump systems using exhaust heat utilization technology under the Moonlight project of the Ministry of International Trade and Industry (now METI) and developed the heat pump system that recovers heat from hot waste water at the temperature of 30°C to 60°C and provides high temperature hot water at the temperature of 100°C to 160°C.

In addition, this heat pump is highly efficient, safe non-combustion system, therefore it has been introduced in various locations such as offices, datacenters, museums, public buildings, district heating and cooling, and hot spring resorts, where air conditioning and high temperature hot water is required.

Based on these results and technology which we have so far developed, we work to develop new heat pump systems adapting to these times of "environmentally friendly" and "energy saving".



Golf course viewing Mt.Fuji



Air heat source
Eco Cute



1. Commercial/industrial CO₂ Heat pump "Eco Cute" for Hot water supply

Considering the environment, safety, economy and energy saving, Mayekawa commercialized a hot water supply heat pump using CO₂ as its refrigerant, which is the world's largest 90kW class hot water supplier. Utilizing know-how accumulated over many years, the heat pump mounts high pressure and high efficiency CO₂ compressor which is an in-house product. Employing CO₂ (GWP: global warming potential = 1) as a refrigerant this unit contributes to the preservation of the global environment as compared to Hydro chlorofluorocarbon(HCFC; global warming potential = 1300 and more). In addition the use of electricity ensures clean and safe operation, not emitting nitrogen oxide(NOx) or carbon dioxide(CO₂). The applicable market is middle and large size facilities such as hotels, hospitals and food plants.

Water Heat Source Eco Cute

"Water Heat Source Eco Cute", which can recover heat from hot waste water, has the highest Coefficient Of Performance (COP) and the largest hot water supply capacity in the industry using CO₂ as its refrigerant. It has capacity of 22,000ltr per day of hot water at temperatures of 90°C under intermediate seasonal conditions. Providing hot water and chilled water at the same time enables considerable energy saving especially in plants which have cooling and heating processes such as food processing plants and hotels. Even in a cold area, the unit achieves high levels of performance by using water which is not affected by ambient temperature as a heat source.

Water heat source
Eco Cute



Bathroom

2. CO₂ Heat pump "EcoSirocco" for Hot air supply

Applying its CO₂ technology of Eco Cute, Mayekawa developed CO₂ heat pump air heater. This equipment is able to generate hot air at 120°C required in industrial drying or heating processes and achieves reductions in both CO₂ emissions and operating costs compared to conventional combustion systems using oil and gas.



3. Mobile air conditioner for aircrafts "ground cooler"

Ground cooler keeps air conditioning working by providing hot or cool air between -2°C and 45°C into aircraft while it is stationary for cleaning or maintenance and engines are stopped. High tech electronic devices aboard the aircraft are especially needed to ensure proper temperature conditions. Mayekawa's ground cooler is employed at many airports because it is equipped with an air conditioner and a blast hose to provide a stable air blast immediately on site.



Ground cooler

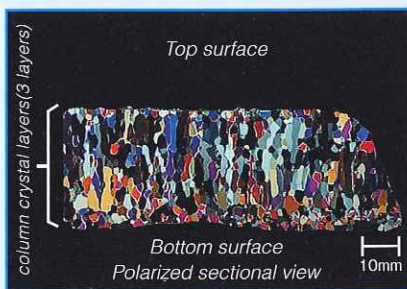
4. Mayekawa's commitment in the air conditioning industry

The development of the Ammonia hermetic Scroll compressor enables us to commercialize heat pump characterized by a small capacity and multiple layout system, high COP, low life cycle costing and minimized refrigerant charge. Multiple number of packages can meet wide range of required, this package will become widespread for air conditioning in various size buildings and food plants.



Ammonia hermetic Scroll heat pump

Artificial Environment technology for the automobile industry



Artificial ice



Artificial snow-making

The development of automobile and automobile parts requires performance assessment in a cold environment. Mayekawa offers compressors and the artificial environment technology for testing apparatus and systems.

For example, Mayekawa has delivered over a hundred compressors for the -50°C environment testing chamber. The artificial snow-making technology can realize almost identical natural snow-falling. Artificial ice surface for testing tire performance at any time of the year contributes to developing the next generation of automobiles.

In painting process of automobile assembly and parts plants heat pump system such as "EcoSirocco" is introduced.

★ The 1998 Nagano Olympic Winter Games in Japan

Mayekawa introduced Ammonia refrigeration systems for all ice games such as speed skating, figure skating, ice hockey, curling rinks and bobsleigh/luge tracks. Mayekawa was also, responsible for the facility operation and managing the superior ice quality for each competition during the games. Nowadays, more than 50% of all ice arenas in Japan use ice rink technology of Mayekawa.



The speed skating arena at the 1998 Nagano Olympic Winter Games

Mayekawa's technology in the oil & gas, petrochemical and chemical industries, focusing on the future of the environment

Mayekawa's compressor technology is applied to compression of various process gasses as well as refrigerants.

The reliability and high level of our compressor technology is highly recognized throughout the world in the fields of process gas compression such as;

- Industrial Gases: Hydrogen, Helium, Carbon Dioxide, etc.
- Raw Material Gases: Vinyl Chloride, Methyl Chloride, etc.
- Active Gases: Chlorine, Hydrogen Chloride, Hydrogen Sulfide, etc.
- Gas mixture and VOC: Associated gases from refinery processes, etc.

● Compressors in environmentally-friendly recovery of natural resources



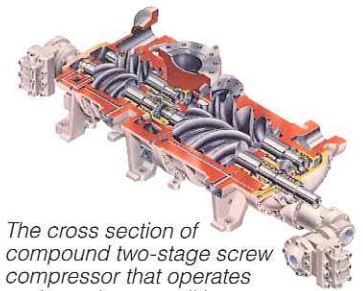
Today, it is common to recover associated gases produced at offshore platform in consideration of environment preservation and effective use of natural resources. The compression process is extremely challenging as these gasses contain high levels of hydrogen sulfide and condensation elements such as heavy molecular weight hydrocarbons. Mayekawa's compressor technology provides solutions for this while meeting the high requirements of offshore platform operations in oil fields such as the Gulf of Mexico, Brazil, Australia, and Indonesia. In Japan, Mayekawa also delivers the world's

biggest screw compressors to liquefaction plants at oil reserve bases.

● Our technology contributes to the cryogenic field

Mayekawa's Helium compound screw compressors are in operation at many laboratories throughout the world in the cryogenic field. In the field of elementary particle science, our compressor packages were adopted for the Large Hadron Collider (LHC) project of the European Organization for Nuclear Research (CERN).

In the development of nuclear fusion, Mayekawa's Helium compressor packages were supplied to the JT-60 machine of Japan Atomic Energy Agency and Large Helical Device (LHD) of the National Institute for Fusion Science, as well as other laboratories in Germany, India, and Korea. The machine is the world's biggest superconductive nuclear fusion reactor, contributing to the realization of the high temperature world of one billion degree Celsius. In addition, Mayekawa's compressor and refrigeration technologies are widely used for the Maglev trains project of the Central Japan Railway Company and in the research field of high-temperature superconductive transmission.



The cross section of compound two-stage screw compressor that operates under various conditions



5MPa compressor



Hydrocarbon vapor recovery compressor package for sea-based platform



The Helium compressor unit delivered to CERN, Switzerland



Maglev train, Japan



Refrigeration systems in the fields of nuclear facilities

A large number of Mayekawa's products are employed as refrigeration systems for nuclear power plants and nuclear fuel facilities, where strict quality management is required.

Nuclear power plant

Mayekawa's new technological developments leading the 21st century

In the 21st century it is desirable that the 20th century mass production and mass consumption society should transfer to the sustainable and stable society on the basis of environment-friendly and natural resources recycling actions.

At Mayekawa, the environmental aspect of its business activity and technology development plays an important role which will naturally lead to what is required for the environment in the 21st century.

- 1. Environmental improvement**
- 2. Resources and energy**
- 3. Foodstuff and health**
- 4. Quality improvement of works**

1. Environmental improvement

- Application of natural refrigerant system against global warming and ozone layer depletion

2. Resources and energy

(Supply side)

- Development of the bio-ethanol plant
- Proposal of high efficiency superconductive power transmission for solar and windmill power generators

(Demand side)

- Development of refrigeration and air conditioning systems using natural refrigerants
- Development of adsorption heat pump system using solar-energy
- Development of high efficiency heat pump system

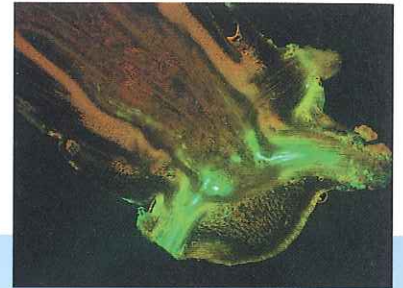
3. Foodstuff and health

- Development of harvesting robots for strawberries and tomatoes
- Development of microbial formulation for rice plants utilizing "Endophytes" found in nature
- New medical and pharmaceutical application of air cycle refrigeration system at -100°C
- Development of Cryo-Needle with liquefied Nitrogen for cancer treatment

4. Quality improvement of works

- Development of robotic system for meat processing plants where massive number of labor is required for hard deboning work

The vertical section of the bottom of the rice plant; a number of bacterial endophytes inoculate at the growth point (green parts).



The cultivation test of rice plants inoculated with bacterial endophytes



Japan and to the World

58 domestic offices and 3 plants, and 80 overseas offices including 6 plants



Corporate office, Tokyo, Japan

★ Moriya plant

This is the main plant of the Mayekawa group. It consists of the department of manufacturing compressors and freezers, the department of after sales services, the department of electronics and plant and Technical Laboratory.

★ Saku plant

Here we develop and manufacture food processing robots.

- 1924 Kisaku Maekawa founded Mayekawa & Co. in Tokyo, Japan.
- 1930 Started ice making and cold storage business.
- 1964 Established MAYEKAWA's first overseas subsidiary company, MAYEKAWA DE MEXICO, S.A.DE.V., Mexico in Mexico.
- 1967 Established our subsidiary company, MAYEKAWA U.S.A. Inc., in Los Angeles, Calif., U.S.A.
- 1968 Established our subsidiary company, MAYEKAWA DO BRASIL LTDA. in Sao Paulo, Brazil.
- 1969 Commenced construction of Mayekawa Moriya Plant in Japan.
- 1970 Commenced to produce compressors in Moriya Plant in Japan.
- 1971 Established our subsidiary company, N.V. MAYEKAWA Europe S.A. in Brussels, Belgium. (with factory annex)
- 1973 Started operations at our assembly plant in Sao Paulo, Brazil.
- 1975 Established our subsidiary company, MYCOM CANADA LTD. in Vancouver B.C., Canada.
- 1976 Established our subsidiary company, MYCOM DE VENEZUELA S.A. in Caracas, Venezuela. Established the representative office in Ecuador.
- 1979 Established our subsidiary company, MAYEKAWA ARGENTINA S.A. in Buenos Aires, Argentina.
- 1980 Established our representative office in Santiago, Chile.
- 1981 Established our subsidiary company, MAYEKAWA SINGAPORE PTE. LTD. in Singapore. Established our plant in Los Angeles, U.S.A.
- 1983 Established our subsidiary company, MAYEKAWA INDUSTRY CO., LTD. in Kaohsiung, Taiwan and ANREC LTDA. in Bogota, Colombia.
- 1984 Established our subsidiary companies, MAYEKAWA AUSTRALIA PTY. LTD. in Sydney, Australia, MYCOM KOREA CO., LTD. In Seoul, Rep. of Korea and MYCOM PERU S.A.C. in Lima, Peru.
- 1985 Established the subsidiary company, P.T. MAYEKAWA INDONESIA in Jakarta, Indonesia. Established our plant in Changwon, Korea.
- 1986 Established our plant in Cuernavaca, Mexico. Started operation at Saku plant in Japan.
- 1988 Established our subsidiary company, MAYEKAWA (M) SDN. BHD. in Kuala Lumpur, Malaysia. Established the subsidiary company, MYCOM (THAILAND), CO., LTD. Built our Compressor plant in our Cuernavaca plant in Mexico.
- 1991 Established MAYEKAWA U.S.A., Inc., in Houston, U.S.A.
- 1993 Established our plant in San Antonio, U.S.A.
- 1994 Obtained ISO9001 (Quality Assurance System Standards) certification.
- 1995 Established MAYEKAWA U.S.A., Inc. Chemical division in Torrance, Calif., U.S.A.
- 1996 Obtained ISO14001 (Environment Management System Standards) certification.
- 1999 Expansion of MAYEKAWA EUROPE plant.
- 2003 Started operation at Mayekawa Higashihiroshima factory in Japan. Opened representative office in Beijing, China. Established our plant for the chemicals industry in Sao Paulo, Brazil.
- 2004 The final completion of Mayekawa Moriya Ice Making Plant in Japan. Established our subsidiary company, MAYEKAWA CHINA INDUSTRIES CO., LTD. in Shanghai, China. Opened representative offices in Moscow, Russia and in Zug, Switzerland.
- 2005 Established our subsidiary companies, MAYEKAWA (THAILAND) CO., LTD. in Bangkok, THAILAND, MAYEKAWA EUROPE DUBAI OFFICE in Dubai, United Arab Emirates, MAYEKAWA U.S.A., INC. in Chicago, U.S.A. Opened representative office in New Delhi, India.
- 2007 Established our subsidiary company, MAYEKAWA REFRIGERATION INDIA PVT. LTD. in New Delhi, India.
- 2008 Established our subsidiary company, MAYEKAWA VIETNAM CO., LTD. in Ho Chi Minh, Vietnam. Established a new plant in Aruja, Brazil by integrating assembly plants and our chemical industry plant. Established MAYEKAWA EUROPE in Germany.



★ N.V. Mayekawa Europe S.A., Belgium



★ Higashihiroshima factory
We mainly manufacture eco-products including Eco Cute and have a casting line.



★ Mayekawa U.S.A., Inc., CA, USA

- ★ Mayekawa plants
- Mayekawa overseas offices



★ Mayekawa U.S.A., Inc., TX, USA



★ Mayekawa De Mexico. S.A.DE.C.V., Mexico



★ Mycom Korea Co., Ltd., Korea



★ Mayekawa Do Brasil Ltda., Brazil



MAYEKAWA
MYCOM

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