Introduction of the Guidebook on Technologies of Environment-Related Corporations in Fukuoka Prefecture

Sharing Environmental Technologies from Fukuoka to the World

–Aiming to solve environmental problems throughout the Asian region

Fukuoka mascot character “Ecoton”

Fukuoka prefecture has accumulated achievements and know-how on overcoming environmental problems over many years and is now taking advantage of this strength to promote exchanges in the environmental field with the Asian region. In particular, we have provided technical cooperation, industrial cooperation and personnel exchanges towards the solving of environmental problems with regions in Asia with which we have friendship relationships (Jiangsu Province, China; Hanoi, Vietnam; Bangkok, Thailand; Delhi Territory, India).

Due to the high level of interest from various regions in the environmental technologies cultivated in our prefecture through such exchanges, this “Guidebook on Technologies of Environment-Related Corporations in Fukuoka Prefecture(2020 edition)” has been published as a public relation material for investigating and organizing the environmental technologies of companies in our prefecture, introducing these things to everyone in Japan and overseas to further promote exchanges on environmental technologies and industries based on the network of our prefecture and partner-local governments.

This guidebook not only presents the latest technologies for solving environmental problems in the areas of waste, water and atmospheric environments, but has also been enhanced with technologies on energy saving and renewable energy based on the global trend of decarbonization.

This time, we would like to introduce companies listed in the guidebook that wish to expand into India. It is our hope that this guidebook will be used widely both in Japan and overseas cities, leading to the introduction of the environmental technologies of companies based in our prefecture and helping to improve local environmental problems.

Waste

MIS Co., Ltd.

Utilizing waste as a resources for environmental improvement and regional revitalization!

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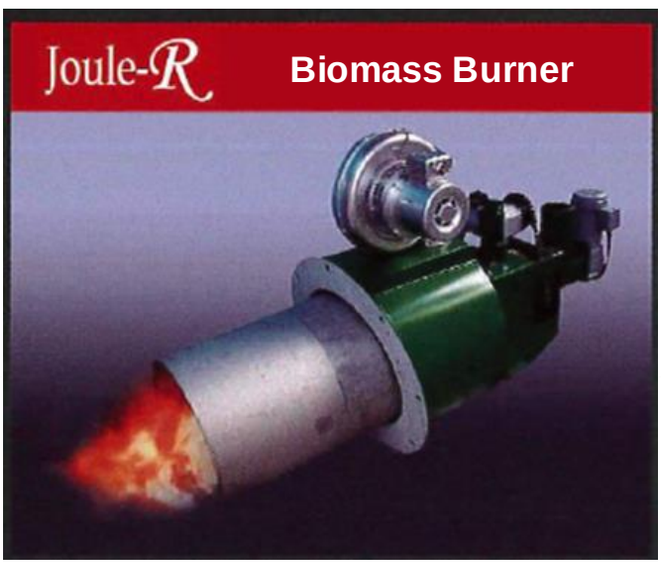
Major Overseas Bases
Active in China (Shanghai)

A social environment system that aims to reduce CO_2 using heat generated from waste that is difficult to reduce as “renewable energy.” We have completed the construction of a combustion and heat utilization system with a biomass burner that doesn’t use oil, in cooperation with a “vacuum dryer” for raw materials with high moisture content, including not only wood but also dust fuel etc. Our equipment meets the purpose of SDGs. They also correspond to the “E” (environment) part of ESG investment! (NAKAMURA Yasuyuki, Representative Director)

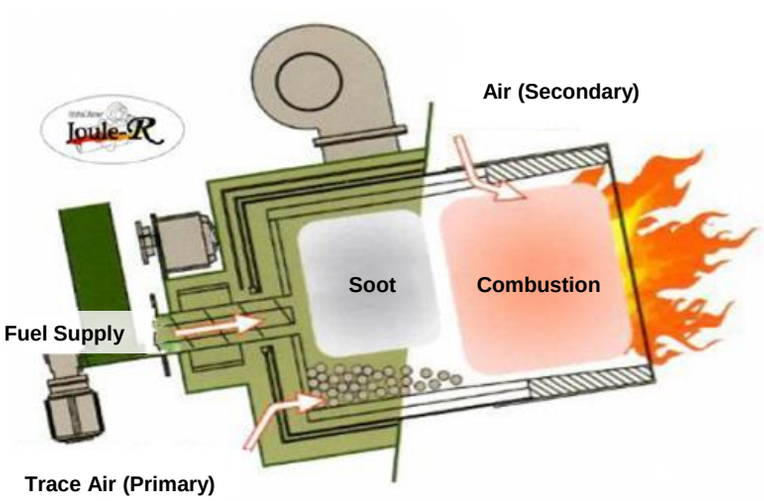

NAKAMURA Yasuyuki, Representative Director　YAMADA Yoshito

“Joule-R” biomass burner that effectively utilizes various waste as fuel

▼ Photo of Joule-R



▼ 2-stage combustion with the gasification and combustion method



Effectiveness

Joule-R is a biomass burner that uses the gasification and combustion method to make use of various waste as fuel. The use of biomass fuel can contribute to **the reduction of CO_2 emissions derived from fossil fuels and the use of sustainable resources.**

In addition, since the company’s biomass burner can utilize various waste as fuel, this can contribute to **promoting the effective use of waste and the formation of a recycling-oriented society**.

Also, since local resources (waste) can be used, this can also contribute to the **revitalization of the local economy**.

Applications

This product can be used by biomass waste discharge and processing companies and businesses that implement cogeneration including biomass power generation.

Strengths

- **High combustion efficiency using the gasification and combustion method**

The process of swirl combustion type gasification burners is divided into two stages for burning. Primary combustion heats with a slight amount of air and dries by distillation to gasify the combustible content, and secondary combustion burns by providing sufficient air to the gas. This suppresses the generation of unburned substances such as soot, improving fuel efficiency.

- **Various waste can be used as fuel**

Swirl combustion type gasification burners (complete gasification and combustion) are able to use various waste as fuel, including wood dust, livestock manure, organic sludge, kitchen waste, wood waste, plastic, tea husks, coffee grounds, and agricultural residue such as rice husks.

- **Remote monitoring service**

We are building a system where the status of biomass boilers can be operated by remote monitoring through the IOT control panel. Using this system enables sensitive changes to combustion chamber temperatures, vibration, accident prevention and the quick response to defects.

Waste

Kakuno Manufacturing Co., Ltd.

Solving both global warming and organic waste treatment with virtual zero CO_2 emissions!

Contact Address
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Major Overseas Bases
Active in Thailand, Taiwan, Myanmar, Philippines, Qatar etc.

Pyrolysis in furnaces without taking in air from outside and without oxygen or nitrogen is a breakthrough effect and solution for global warming and garbage disposal. The volume of garbage can be significantly reduced without releasing CO_2 or harmful gases into the atmosphere, and it can be recycled and reused.
(KAKUNO Toshimitsu, Representative Director)

KAKUNO Toshimitsu,
Representative Director

Next generation pyrolyzer realizing the overwhelming reduction and recycling of organic waste

▼ Appearance of next generation pyrolyzer

▼ Comparison of pyrolyzer and incinerator/carbonizing furnace

Type	*Pyrolyzer*	*Carbonization Furnace*	*Incinerator*
Garbage disposal level	Level 5	Level 4	Level 3
Processing temperature	300-700℃	800℃	800℃
By-product	Para-metals	Charcoal	Charcoal
Volume reduction	1/200-1/500	1/10-1/40	1/10
CO2 emissions	N	Y	Y

*Garbage disposal level (Organic waste garbage)
Level 1: Garbage is not collected but is abandoned in the city.
Level 2: There is no garbage incineration facility and garbage is left as is to pile up at designated places.
Level 3: Garbage is incinerated to reduce the volume of garbage to ash and is buried in landfill.
Level 4: Garbage is recycled and used effectively but unused items are buried in landfill.
Level 5: CO_2 emissions are eliminated as a measure against global warming, and everything is used as a resource, with nothing going to landfill.

Note: These garbage disposal levels are determined by the company through exchanging opinions with experts. The figures and by-products in the table are according to the company's research. CO_2 emissions refer to the burning of waste and fossil fuels during operation (energy for start-up not included).

Effectiveness

Conventional incinerators burn fossil fuels and organic waste, emitting a large amount of CO_2 and generating a huge amount of incineration ash. There is a high cost involved in procuring these fossil fuels and disposing of the incineration ash on an ongoing basis.

On the other hand, next generation pyrolyzers **do not emit CO_2 from combustion** and can **reduce the volume of organic waste to 1/200**. Collected items can be expected to be used as new "para-metal" materials, so there is **no need for landfill disposal**. We believe that **pyrolyzers** can be **a trump card in realizing a carbon neutral and carbon-free society.**

Applications

With the introduction of this equipment, it will be possible to properly process waste plastics which have become a social problem to recycle, further ensuring profitability. This also leads to the suppression of waste plastic that has been abandoned in cities, mountain villages and oceans due to a lack of equipment or improper processing, contributing to solving the microplastic problem.

Strengths

- **Recycling as new materials without emitting CO_2**

Conventional incinerators emit a large amount of CO_2 from their combustion and the disposal of incineration ash is also costly. Pyrolyzers process under anoxic conditions, so there are none of the CO_2 emissions from conventional combustion. At the same time, with the sale of collected items continuous profits can be expected.

- **Achieve efficient power generation with little waste heat loss**

Because the pyrolyzer doesn't have a chimney, neither exhaust gas nor exhaust heat is discharged into the outside air and there is very little waste heat loss. Because the heat is retained, hot water and steam can be fully recovered and used to provide highly efficient power generation. In addition, gases are removed by a smoke deodorizer, and because it is circulated internally it is smokeless and odorless and can be installed indoors.

- **Improved profitability from new materials with high added value**

We are promoting the development of new applications (fertilizer, paint, electrical materials etc.) for collected new materials, "para-metals," with different players such as universities. Selling the collected items is expected to generate greater continuous revenue than the process of waste disposal. This can also contribute to the effective use of rare metals in waste, which have not been effectively collected in the past.

Waste

Saimu Corporation

Contributing to the promotion of plastic recycling with a unique analysis

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The price of waste plastic depends on its purity and the reliability of its quality. Our technology improves both of these things, increasing the utility and value of waste plastic. We have a track record of supplying plastic with 99% or more purity for horizontal recycling for home appliance recycling. (TSUCHIDA Yasuo, Representative Director)

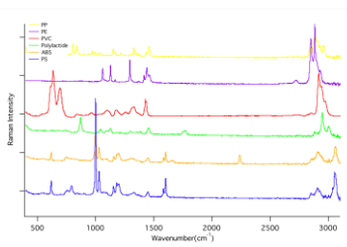
TSUCHIDA Yasuo, Representative Director

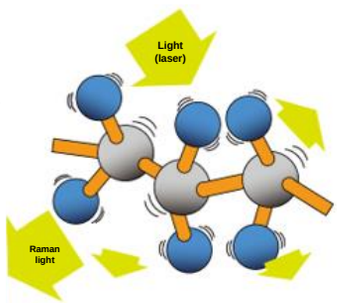
Advanced sorting of mixed plastics using Raman spectroscopy

▼ External view of Raman plastic sorting device

▼ Illustration of recycling using the Raman sorter

▼ Illustration of identification using Raman spectroscopy





Effectiveness

The Raman Plastic Sorter is a device that can sort mixed plastic waste by material utilizing “material identification technology using Raman spectroscopy.”

By **promoting the effective recycling of plastic**, we can contribute to **the reduction of landfill waste disposal and improved resource efficiency**.

In addition, high-quality recycled raw materials can **prolong the lifecycle of the materials** in comparison with low-quality recycled products, leading to **the sustainable use of resources**.

Applications

This can be used by businesses that have implemented or are considering plastic recycling. We also sell the Raman plastic identification device on its own, which can be used to identify high-performance materials.

Strengths

- **High-precision identification and sorting using Raman spectroscopy**

Raman spectroscopy takes advantage of the phenomenon by which the wavelength of light changes when light is applied to a substance due to the influence of molecular vibration, and this technology measures increased light in the visible light region. By combining this with a sorter, it is possible to identify and sort a wide variety of mixed plastic waste materials such as ABS and polystyrene by material. It can also identify and sort objects even if its surface is wet.

- **Advanced sorting in combination with impurity removal technologies**

We also have the technology to sort and separate impurities (lint, urethane, rubber etc.) in automobile shredder residue utilizing the differences in restitution coefficients or electrostatic adsorption. More advanced sorting is possible using the Raman Plastic Sorter.

- **Rich experience and know-how in plastic sorting**

We have been sorting various plastics since 2002 and have also developed factory packaging material sorters and presses. We can provide advice for plastic recycling businesses, taking advantage of this rich experience and know-how.

Waste

Genuine R&D Co., Ltd.

Discovering and developing functional ingredients and providing genuinely reliable products!

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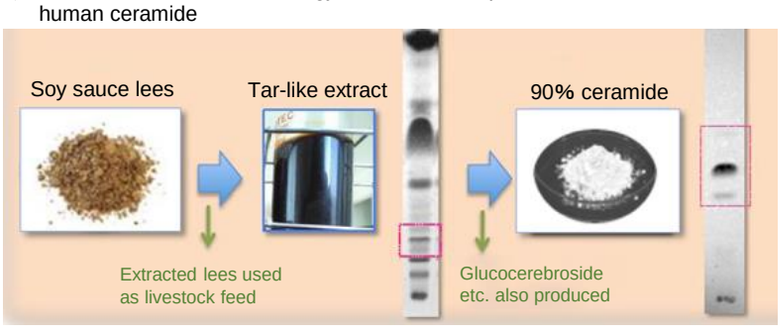
+81-774-94-5121/info2@genuinerd.co.jp
Major Overseas Bases
Active in USA (Los Angeles)

We have been researching naturally derived functional ingredients from non-standard crops and processed food waste, based on the concept of "things that can't be found anywhere else!" We have been successful in developing natural human ceramide, a rare material in the world, and manufacture final products at our in-house GMP certified factory* based on evidence of safety and functionality. (MIYANABE Masakatsu, Representative Director)
*GMP (Good Manufacturing Practice): Third-party certification for health food manufacturing and quality control

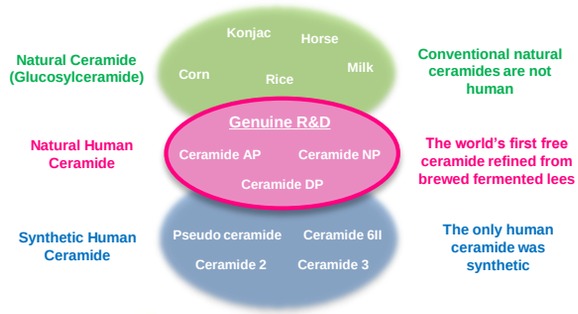

MIYANABE Masakatsu
Representative Director

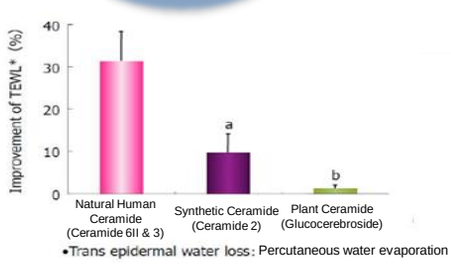
Collection and development of materials from food processing residue using "natural human ceramide"

▼ Advanced utilization technology focused on the production of natural human ceramide



▼ Types of ceramides and water retention/barrier function effect of natural human ceramide





▼ Manufacture of functional cosmetics and supplements utilizing food waste

Effectiveness

The recovery of high value-added substances which were previously discarded from food processing residue and the provision of this as materials can be useful in the **reduction of waste disposal** and the **effective use of resources**.

In the case of soy sauce lees, the collection of "natural human ceramide" which is a functional substance with high cosmetic effect, and the use of by-products for feed achieves **advanced circulation for food processing residue**. And by utilizing these materials, we can deliver **environmentally friendly products** (health foods, pharmaceuticals, cosmetics, etc.).

Applications

New functional substances may be found even in the residue from food processing factories that is usually discarded. We want to realize the development of materials for cosmetics and pharmaceuticals that are friendly to the earth and people, through the process of collaborative research and development.

Strengths

- **World's first Purification of natural human ceramide**

Human ceramide is one of the lipids contained in the stratum corneum of the skin and is an indispensable ingredient for skin moisturizing and barrier functions. We have been the first in the world to succeed in the extraction and purification of human ceramide from abandoned brewed fermented lees.

- **Higher barrier functions from "natural" and "human type"**

Non-natural synthetic ceramides only contain limited types of short ceramides out of the approximately 350 types of human ceramides. Non-human natural ceramides have a structure different from ceramides present in the human stratum corneum, and have difficulty penetrating and moisturizing. Because these are human and natural ceramides, they feature high moisturizing power and barrier functions.

- **Technology to extract/purify various functional substances**

We are conducting research and development into technologies to extract and purify functional substances other than natural human ceramide from various food processing residue etc. These extracted functional substances can provide needed raw materials for the manufacture of health foods and medicines, cosmetics, and fertilizers and also provides support for commercialization.

Waste

Hitachi Zosen Corporation

Providing a value that is useful to a society with technology and sincerity!

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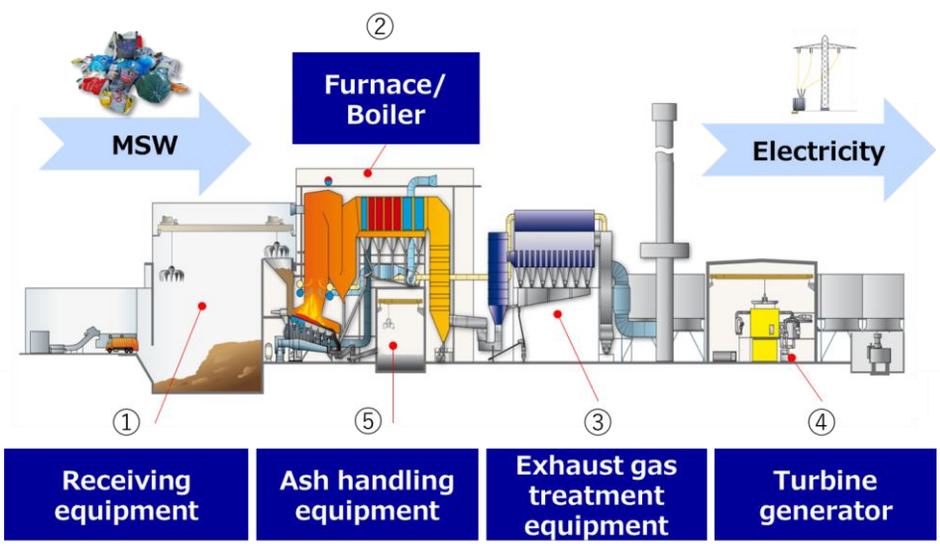
Major Overseas Bases
Hitachi Zosen Trading (Shanghai) Co., Ltd. (China)
HITZ (THAILAND) CO., LTD. (Thailand)
HITACHI ZOSEN VIETNAM CO., LTD. (Vietnam)

We continue to provide value with advanced technology and sincerity in response to environmental problems, based on our corporate philosophy of “we create value that is useful to society with our technology and sincerity, contributing to a prosperous future.” We do our best as a solutions partner to contribute to the realization of a recycling society and a safe and secure society. (HOSHIKO Keisei, Representative)

TOKUO Masanobu, Kyushu Branch President
HOSHIKO Keisei, Representative
NOJIRI Masatomo, Director (from left)

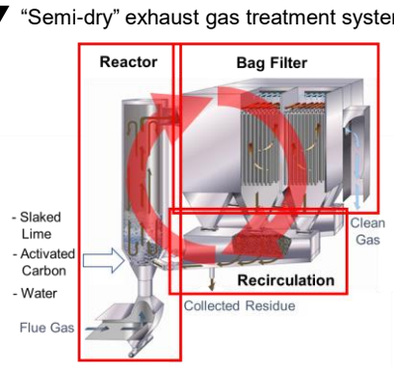
Achieving **“highly efficient Waste-to-Energy”** process based on more than 950 successful implementations

▼ Waste-to-Energy facility schematic diagram



▼ “A.I/TEC” providing remote monitoring support etc.

▼ “Semi-dry” exhaust gas treatment system



Effectiveness

Waste-to-Energy facilities use the biomass in waste as a source of heat and electricity, **reducing the amount and volume of waste (about 80-90%)**, and at the same time this can also **reduce greenhouse gas emissions** derived from fossil fuels.

More efficient power generation can be realized by optimizing operating conditions through 24-hour remote monitoring.

Also, our in-house developed exhaust gas treatment equipment (Semi-dry) can **effectively remove harmful gases such as SOx and HCl** which cause air pollution. “Semi-dry” has been introduced in more than 20 facilities and all such facilities meet EU exhaust gas standards.

Applications

Not only can waste be disposed of properly, electricity can be generated using the heat generated in the treatment process. We support a wide range of waste quality, including high moisture content waste from Southeast Asian countries.

Strengths

- **“A.I/TEC” support for operation optimization and stability**

Waste-to-Energy facilities operated by our company receive 24-hour remote monitoring support from our A.I/TEC (Hitz Advanced Information Technology Center) located at our Osaka head office.

This makes it possible to optimize and stabilize operations with troubleshooting support and operation improvement services using data such as data management and analysis.

- **“Semi-dry” high efficiency and low-cost exhaust gas treatment**

By recirculating collected fly ash into the reactor, the amount of slaked lime used can be reduced by reusing the unreacted slaked lime included in the collected fly ash. There is also a feature to reduce the amount of fly ash collected from bag filters.

- **Proposals based on our proven track record and original technology**

We have installed more than 650 units throughout Asia and more than 950 units around the world over 50 years. We can provide optimal proposals for our customers based on our abundant track record in Waste-to-Energy business and our unique technologies.

Waste

Fukuoka Bioindustry Development Research Institute

Protecting food-safety and the environment with the power of microorganisms!

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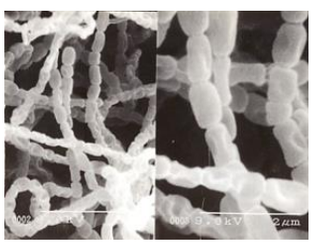
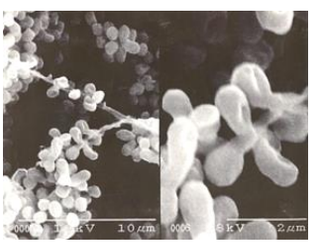
We effectively return to the soil organic matter nutrients that have been robbed from soil, reducing the use of pesticides and fertilizers as much as possible, and regaining the original nutrition and strength of crops, thinking first about “protecting food, human health and the environment for the future.”
(TANAKA Kiwami, Research and Development Department)

TANAKA Kiwami,
Research and Development Department

Highly efficient recycling of organic matters using **functional actinomycetes**

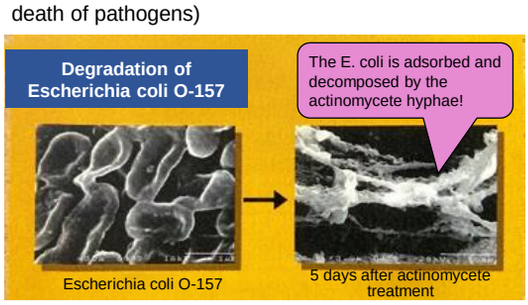
▼ Functional actinomycetes (patented advertising bacteria)

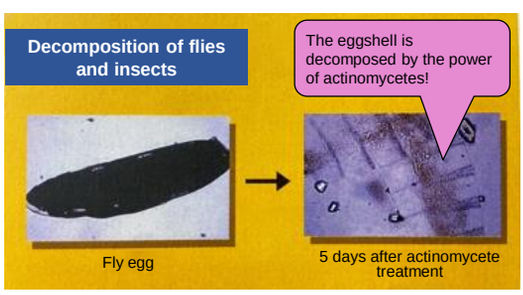




▼ Actinomycete Functional Manufacturing System (AFMS)

▼ Effect of actinomycetes (prevention of flies and death of pathogens)





Effectiveness

The action of selected highly functional actinomycetes allows raw waste and livestock excrement to be used effectively as compost, **reducing waste generation** and contributing to **promoting the effective use of resources**. By taking advantage of its high decomposition ability, it suppresses the generation of foul odors and flies and also leads to **the improvement of hygienic environments and measures against odors around composting facilities and barns**.

It has the effect of killing various pathogens and can decompose persistent organic substances (chitin, keratin, collagen etc.) and substances that prevent germination and growth such as phenols which are not easy to decompose, **providing high quality compost with fewer harmful substances**.

Applications

This technology can be introduced in livestock barns as well as composting facilities treating organic waste discharged from ordinary households and food factories. We not only sell microbial materials, but also develop composting equipment.

Strengths

- **Selected actinomycetes with high decomposition ability**

We recycle waste and purify the environment using actinomycetes with high decomposition ability against organic matter which are repeatedly cultured and selected inhouse. The optimal actinomycetes can be provided, combining features depending on the application. Substances that can be difficult to decompose by other microorganisms (such as chitin, phenols etc.) can be decomposed.

- **High value-added compost production using raw waste as a resource**

We have achieved the high-quality production of compost by decomposing phenols that adversely affect germination and growth while suppressing the generation of foul odors and flies, killing pathogens by the action of actinomycetes. Quality analysis has confirmed the quality of this compost.

- **Improves the sanitary environment of barns and contributes to odor control**

By suppressing the generation of foul odors and flies and killing pathogens, not to mention the composting of livestock waste, this contributes to a hygienic environment inside and outside barns and measures against odors. The high deodorant effect and efficient compositing and economy of our in-house developed compost manufacturing equipment are attractive.

Water

Ishikawa Engineering Co., Ltd.
Mitsubishi Chemical Aqua Solutions Co., Ltd.

Ishikawa Engineering

Mitsubishi Chemical Aqua Solutions

Providing reliable services based on abundant achievements!

Ishikawa Engineering Co., Ltd.
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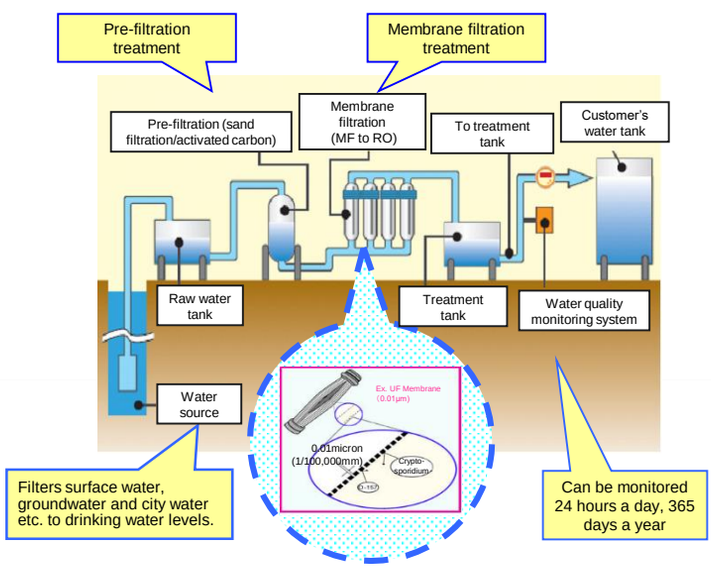
Mitsubishi Chemical Aqua Solutions Co., Ltd.
Contact Address: 2-2-28 Gintenmachi, Hakata-ku, Fukuoka
Telephone/Email: +81-92-574-1431/https://www.mcas.co.jp/en/contact/
Major Overseas Bases: Active in Philippines, Myanmar

We are expanding the safe, secure and inexpensive supply of water overseas, mainly in Indonesia, with the cooperation of Kitakyushu City Hall. We will continue to provide “safe water,” one of the goals of the SDGs. (NAKASHIIMA Hideshi, President and CEO of Ishikawa Engineering Co., Ltd.)
Water is indispensable for people’s lives and industrial development, and we provide the best water for our customers. We use water treatment technologies and expertise cultivated in Japan to provide high value-added solutions all over the world to meet the needs of our customers. (YANAGAWA Hideto, Representative Director, President and CEO of Mitsubishi Chemical Aqua Solutions Co., Ltd.)

YANAGAWA Hideto, Representative Director, President and CEO of Mitsubishi Chemical Aqua Solutions

Providing safe and secure water with **decentralized water supply systems**

▼ Basic flow of drinking water supply system



▼ Water treatment system introduced at Kagoshima University Hospital (left), “WeLLDAS™” remote monitoring unit (right)

▼ Drinking water supply business in Southeast Asia

Effectiveness

We **provide high quality drinking water and domestic water** using groundwater, surface water and tap water as raw water, by performing a process using pre-filtration (sand filtration/activated carbon) and membrane filtration (ultrafiltration membrane, reverse osmosis membrane, etc.). This can be installed in an area the size of a couple of cars and can be installed with a small investment compared to large-scale intensive water purification plants. In addition, by adopting the remote monitoring system (WeLLDAS™) we can achieve prompt response in the case of abnormalities and can provide preventive maintenance for breakdowns so that the **water supply system can be used with confidence**.

Also, due to the minimal need for laying water infrastructure such as pipelines and pumps with distributed water supply systems, this also leads to the **reduction of CO_2 emissions generated from water supply**.

Applications

We deliver high quality and delicious drinking water for various customers such as hospitals and schools, hotels, train stations, shopping malls and homes etc.

Strengths

- **Abundant implementation results in Japan and around the world**

We have abundant results from implementing more than 1,300 distributed water supply systems throughout Japan and around the world, including in Asia. We provide service with reliable quality based on the equipment design and manufacturing know-how and water treatment and water supply system expertise cultivated through these achievements.

- **Distributed water supply to meet customer needs**

Safe and secure water can be provided even in areas where there is no water supply infrastructure in place by using groundwater and surface water as raw water. We are also developing services that meet the needs of our customers to offer higher quality and more delicious water using tap water as raw water.

- **“WeLLDAS™” maintenance management optimization**

The water supply system can be constantly monitored remotely making it possible to make prompt response in the case of abnormalities and to provide preventive maintenance for breakdowns to perform optimal maintenance management. Security cameras are also installed for water supply systems, which can be useful for measures against intruders.

Water

Kankyo Electronics Co., Ltd.

Creating a safe and secure society with reliable products

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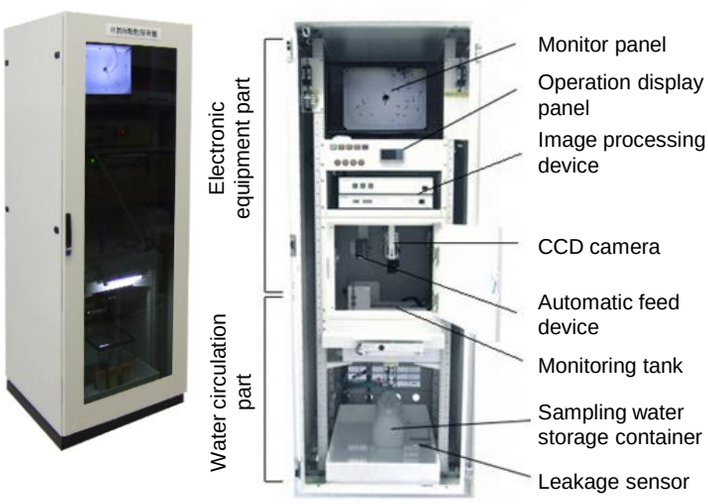
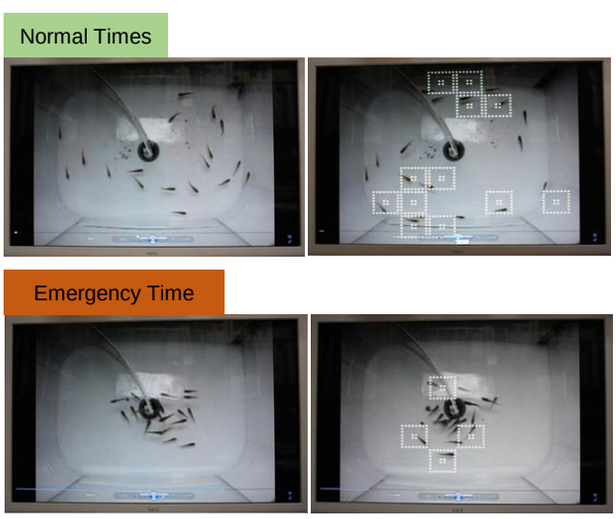
We provide solutions with our equipment to waterworks bureaus around Japan to ensure safe “water” important for daily life. We have a record of being No. 1 in Japan for delivering water safety monitoring equipment. Our technology helps you to be able to drink “water” with peace of mind! (YAMAMOTO Junichi, Sales Manager)

TAKAI Mizuki (left), YAMAMOTO Junichi (center), TAKAGI Yusuke (right)

Continuous automatic water quality monitoring system “Medaka Bioassay” with **a killifish “Himedaka”** and **automatic image analysis technology**



▲ Necessary functions are condensed into a simple form with excellent seismic and lightning resistance. Daily maintenance is easy at low cost and high performance.



▲ If cyan flows in, the himedaka freeze due to their predatory defense instinct, and the abnormal behaviour of their stopping is detected and an alert is issued.

Effectiveness

The “Medaka Bioassay” water quality automatic monitoring device is a device that uses himedaka to **automatically and continuously monitor water quality, 24 hours a day**. With an inflow of about 1.5 liters of raw water per minute, the behaviour of about 20 himedaka can be analysed in images to monitor the water quality.

In the event of a slowdown in the movement of the himedaka, or abnormalities such as death an alarm can be issued, allowing for the **early detection of raw water contaminated by poisonous substances etc.**

Applications

Many have been introduced at waterworks and sewage facilities to ensure the safe supply of water, and it is also used for monitoring water intake from rivers for food and beverage factories and for wastewater discharged into rivers from factories.

We have installed about 250 units at purification plants in Japan alone. This contributes to the early detection of abnormalities, with a track record of having detected the influx of pesticides in the past.

Strengths

- **Himedaka Bioassay**

Bioassay is a method of detecting harmful substances using living things, and its utilization has been promoted in Japan since its use in measures against terrorism about 20 years ago.

Himedaka are used in Kankyo Electronics water quality monitoring devices. Himedaka have high sensitivity to toxicity and little individual difference in response, an ecological fact that has been elucidated academically, and they have been designated by the OECD as an inspection fish. With a wealth of data, results are reliable.

- **Unique image analysis technology**

Himedaka in a water tank are observed with a CCD camera, and images are captured and analysed by an image processing device. Alarms are then issued in stages according to the amount of activity of the analysed himedaka. If there is an abnormality in water quality, a sample of the water is collected as this alert is issued.

This is proprietary image analysis technology, which features very few false alarms. Because of its continuous automatic operation, a remote monitoring system can be constructed, and unmanned management and labour saving can be achieved.

Water

FIRST SOLUTION Co., LTD.

Proposing the best answer for our customers on wastewater and sludge treatment!

Contact Address
2-5-13 Matsuyama, Jonan-ku, Fukuoka
Telephone/Email
+81-92-981-2631/toiawase@1st-solution.jp

On site, you will only need an “SR series” sludge reactor to react the sludge and coagulant, and “Eco Pouch” self-weight dehydration bags. This is low power and can be transported by a 2-ton truck. Sludge disposal costs can also be reduced since volume is reduced on site. (TAKADA Masafumi, CEO)

TAKADA Masafumi, CEO

“MC Method” sludge dehydration technology that is easy to move and operate, with low initial running costs

▼ Toyota Lexus brand resin parts manufacturer
Hoyo Seiko Co., Ltd.
●Uses
Wastewater treatment, sludge dehydration, wastewater recycling (treated wastewater is reused on production lines)

Our original “Eco Pouch” achieves significant cost reductions compared to mechanical dehydrators

▼ Shiga Zeze water purification plant
Seibu Landscape Co., Ltd.
●Uses
Recycling of sludge generated when using water from Lake Biwa to make drinking water. The dehydrated sludge is reused as soil in parks etc.

Effectiveness

The mesh cut (MC) method is a dehydration system for the high-speed sedimentation and separation of wastewater and sludge using an “SR series” sludge reactor and “Floccman” powder flocculant, and dehydration using self-weighted “Eco Pouch” dehydration bags.

In addition to its **high dehydration function and volume reduction performance**, it is small and lightweight, and has excellent portability, making it possible to be **used for muddy water at construction sites** which could not be processed well in the past.

In addition, “Floccman” can not only be used for the MC method but can also be used as a **soil conditioner or a fermentation accelerator during organic fertilizer production**.

Applications

This technology can be used in a wide range of applications from factory wastewater to groundwater treatment, dehydration of construction sludge, purification of ponds and lakes, dehydration of sludge from water purification plants, solidification treatment of dredged sludge, and promoting the fermentation of organic fertilizer.

Strengths

- **Compact “SR series” sludge reactors**

The “SR series” sludge reactor is lightweight, compact and easy to operate, with few failures, realizing wastewater and sludge treatment which can be loaded onto a 2-ton truck and moved. It has a high processing capacity in spite of it being compact and consists of rapid and slow stirring layers and settling tanks.

- **Highly efficient powder flocculant “Floccman”**

A high-performance flocculant capable of the flocculation of wastewater and sludge. This is a flocculant optimized for the MC method, which has a very fast reaction speed and can adsorb and separate dirt particles from supernatant water in a short amount of time. It is also an environmentally friendly flocculant since it is made from natural ingredients.

- **“Eco Pouch” self-weight dehydration bags with dehydration function**

Japan’s only self-weighted dehydration bag manufactured under the flexible container bag standards (JIS/JFC). The dehydration performance of the central part is improved due to its special donut-shaped structure. Dehydration happens just by hanging, and it can be transferred as is to a vehicle and transported. They are also high strength, safe and durable, and are reusable.

Atmosphere

Kawasaki Heavy Industries, Ltd.

Working for a better environment and a brighter future for generations to come

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Tokyo Head Office: 1-14-5 Kaigan, Minato-ku, Tokyo
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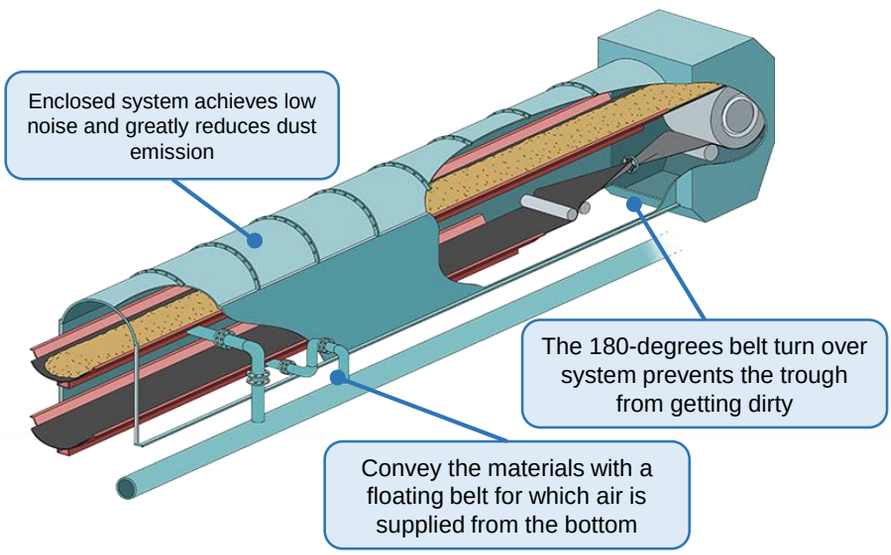
Tokyo Head Office: +81-3-3435-2111
https://global.kawasaki.com/en/corp/profile/contact/index.html

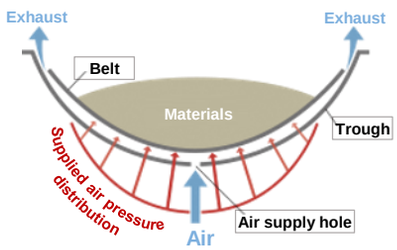
This product proposes solutions to issues such as measures to tighten environmental regulations, efforts to protect the environment, and reducing operating costs etc.We have a video which introduces in detail the mechanism of air floating-belt. Please search “FDC Kawasaki” on the Internet. (MIYAKE Maho, Industrial & Hydrogen Plant Sales Section, Overseas Plant Sales Department, Energy System & Plant Engineering Company)

MIYAKE Maho, Energy System & Plant Engineering Company

Environmentally friendly conveyor with Air Floating-belt



▲ Basic structure



▲ Convey the materials with a floating belt for which air is supplied from below the trough

▲ Handling coal and minerals etc. in power plants and steelworks

Effectiveness

“Flow Dynamics Conveyor” (FDC) is an air floating conveyor supplying air from the bottom of a trough and floating the belt in the manner of an air bearing. The enclosed system with no roller in the intermediate section achieves **easy maintenance** and high-speed handling with **low noise and low vibration**. Furthermore, covering it with a casing prevents dust from spilling and **improves air pollution and working environment**.

Applications

FDCs are used for handling mainly coal, coke, iron ore and ash in power plants and steelworks. It can also be installed in urban areas since it doesn’t spill dust and has low noise and vibration. We have a track record of more than 300 units in Japan and overseas.

Strengths

- **Air Floating- belt**

No roller is required in the intermediate section since air pressure supplied from below and balanced with the load acting from above (the weight of the belt and the materials), floats the belt slightly in the manner of an air bearing.

It enables to reduce power consumption, suppress noise and vibration and increase handling speed in comparison with conventional conveyors. High-speed handling also enables to install it in small space since it allows to handle a larger amount of materials with narrower belt width. Also, turning the belt over at 180 degrees at return side prevents the trough from getting dirty. It reduces maintenance costs as the conveyor does not need to be cleaned.

- **Enclosed system**

The enclosed system prevents dust spilling and suppresses noise.

- **Prefabricated construction**

The relevant equipment is assembled in advance and transported, significantly shortening the construction period at the construction site.

Atmosphere

Chugai Technos Corporation

We carry out reliable inspections and analysis which you can trust and have confidence in!

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+84-28-3620-9222
Chugai Technos India Private Limited (India)
+91-(0)80-4148-8221

In December 2020 we established “Chugai Technos India Private Ltd.” in Bengaluru, India. In addition to Southeast Asia through out Vietnamese company we are also meeting the needs for inspections and analysis in India and the Middle East.
(TAGAMI Akinori, Kyushu Branch Manager)

TAGAMI Akinori,
Kyushu Branch Manager

A comprehensive analysis company which **handles environmental inspection and analysis**

▼ Denitration device performance test

▼ Pipe blockage inspection

▼ Sampling equipment system used for inspection and analysis

▼ Chugai Technos India

Effectiveness

We perform performance tests of environmental equipment such as dust collectors, desulfurization/denitration devices, power generation boilers, and water treatment facilities and can **realize the optimal operation of equipment** by evaluating the results. We can support ISO and EPA (US Environmental Protection Agency) methods in addition to JIS (Japanese Industrial Standards).

The optimal operation of environmental equipment not only leads to **improved productivity and the appropriate maintenance and management of environmental equipment** but can also reduce costs by reducing reagents used in environmental equipment and save energy. The performance of environmental measurement and analysis based on environmental laws and regulations can contribute to the **conservation of air and water environments**.

Applications

We provide performance tests of various environmental devices such as desulfurization and denitration equipment and exhaust gas/drainage analysis services in thermal power plants, cement factories, garbage incineration facilities and petrochemical plants etc. We also focus on the inspection of pipe blockages in plants.

Strengths

- **Responding to a wide variety of environmental measurement and analysis needs**

With wealth of achievements over more than 40 years and advanced expertise, we delivery highly reliable data for all environmental measurement and analysis needs from the analysis of air and water quality, exhaust gas, wastewater and waste, to environmental monitoring, the survey of chemical substance emissions and the microanalysis of harmful substances. We have particular strengths in plant performance tests and soot and smoke measurement for thermal power plants, and the use of non-destructive inspection technologies for various piping inspections.

- **Cross-sectional business development from manufacturing to test run/operation**

In addition to the performance inspection and analysis of various devices, we can fully respond to your needs at every stage, from plant test runs and operation/monitoring, as well as equipment design and manufacturing/sales.

- **Full local/foreign language support system**

We have established local companies in Vietnam and India and can handle inspections and analysis in the local languages. We also have a dedicated department capable of support in English even in Japan and can communicate smoothly and create accurate and rapid English reports.

Atmosphere

BEC Kyushu Co., Ltd.

Proposing solutions that accurately grasp the problems that are closest to our customers!

Contact Address
408-1-101 Naka, Iizuka, Fukuoka
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+81-948-30-2600/info@bec-kyusyu.co.jp

Since our establishment, our company has been manufacturing and selling dust prevention devices at the core of our environmental business. We have a track record of dust countermeasures in a wide variety of industries, and we look to work with our customers to design products suited to them to solve problems that our customers have in their work environments. (OKU Nobutaka, Representative Director)

OKU Nobutaka,
Representative Director

A **dust prevention system** which is friendly to the atmosphere and working environments

▼ Foam spraying and dust prevention effect

Before foam spraying

During foam spraying

▼ Special mist spraying and dust prevention effect

Before mist spraying

During mist spraying

Effectiveness

High dust generation prevention effect can be obtained by introducing the “foam spraying method” or “special mist spraying method,” depending on the requirements and process features of the customer. In addition to the **conservation of the atmospheric environment**, the on-site **working environment and health of workers** can be protected. This is effective not only on visible dust, but also on **suspended particulate matter with a diameter of 10㎛ or less**.

Also, with the combination of dust inhibitor and foam or mist, this can lead to an increased dust capture rate and **reduced water consumption** compared to using water alone. Reducing the amount of water used not only minimizes the water that adheres to objects and equipment but is also expected to have a **cost reduction effect**.

Applications

We have abundant experience in the crushing processes mainly in recycling plants, quarries, foundries and steelworks etc. We optimize our proposals by adjusting the amount of mist based on dust generated in each process.

Strengths

- **Dust source countermeasures using “foam spraying method”**

The generation of dust from crushers which are sources of dust can be suppressed by directly spraying foam on them. Since measures are taken at the source of the dust, the feature is that the effect lasts until subsequent processes. Foam is used because it has a larger surface area than water and can efficiently capture dust.

- **“Special mist spraying method” for floating dust**

Mixing in a dust inhibitor reduces the surface tension of the water, and because of the increased wettability of the dust the efficiency of the dust removal is improved, making it possible to clean the air in a short time. By using a mist (mist with diameter of 10-100 ㎛), the probability of the dust and water colliding is increased, achieving a high dust measure effect with reduced water usage.

- **Provision of safe and eco-friendly dust inhibitors**

The main features of the surfactant that is a dust inhibitor is that it has excellent detergency, foaming power and emulsifying power and biodegradability. Only substances that have been verified to be safe are used and because they are only used in very small amounts it doesn’t adversely affect the surrounding environment.

Energy

Agritree Co., Ltd.

Continuing to create sustainable foods and energy

Contact Address
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Telephone/Email
+81-92-953-2725/info@agritree.jp

Solar sharing was created in Japan to help solve the world's food and energy problems and to create a world without hunger, poverty or plunder. By moving ahead with installations in rural areas and non-electrified areas around the world we hope that this will contribute to a more peaceful world. (NISHI Koji, Representative Director)

ISAKA Jiro (left), NISHI Koji (right)

Joint business of an agriculture and solar power generation "Solar Sharing"

▲ Example of introduction of Solar Sharing

▲ Solar panels installed on farmland

Effectiveness

The solar sharing system is a mechanism for sharing solar power for agricultural production and power generation by installing narrow solar panels on high pedestals above farmland.

Merits include allowing the effective use of space above farmland while continuing farming, **supporting farm management** by providing **power generation income**.

In addition, the introduction of solar power generation can contribute to **the reduction of CO_2 emissions**. This also leads to **the suppression of new land development** for power generation by utilizing existing agricultural land.

Applications

We are able to both secure new sources of income for farmers while also reducing their costs through private power generation. This can also be used as a power generation facility for rural areas with no power facilities.

We can also carry out projects in cooperation with power generation companies or government officials.

Strengths

- **Creating further value from farmland**

This system features the ability to generate electricity by making effective use of existing farmland, without the need for new land development. This allows farmers to keep down the cost of land development, while also increasing income and reducing other costs. We propose a design (panel angles, spacing etc.) which secures solar radiation while maintaining suitability for growing crops and not affecting the harvest of crops.

- **Business plan formulation to financing**

We not only support for formulating business plans, designing and construction management but offer comprehensive support for the implementation of solar sharing businesses including negotiating with overseas financial institutions based on experience cultivated in Japan.

- **System that can be introduced on various farmland**

We have a track record of introduction in Japan and have introduced systems in farmland for potatoes, onions, sweet potatoes, peanuts, taro, soybeans, wheat, and blueberries etc. The system can also be introduced into a variety of other types of farmlands including rice fields etc.

Energy

Kitakyushu Media System Co., Ltd.

Proposing new environmental technologies as we look ahead to the future!

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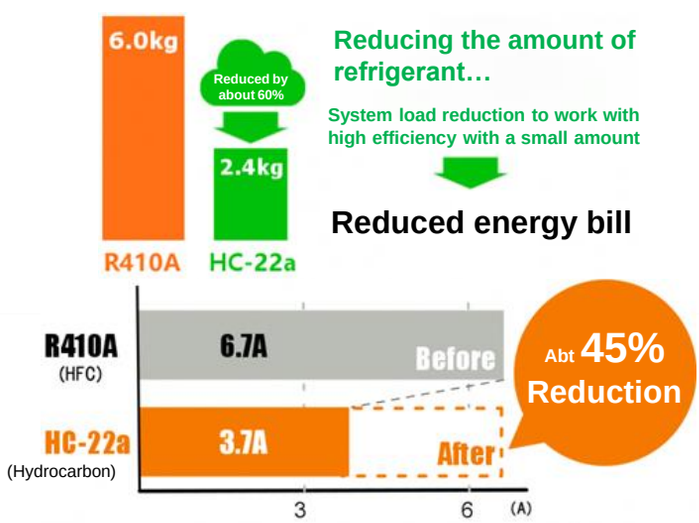
+81-93-245-8664/Ksystem@sat.bbiq.jp

Since our founding in 1999 we have engaged in the construction of electrical equipment and communication equipment based in the Kitakyushu area, and are celebrating our 22nd year with the slogan of "treasuring connections between people." We are deeply grateful to all of you for this. (NAKAYAMA Yasuhiro, Representative Director)

NAKAYAMA Yasuhiro,
Representative Director

Use of **hydrocarbon refrigerant and provision of solar power generation system** that can be trusted by our customer

▼ By switching from CFC substitute (R410A) to hydrocarbon refrigerant (HC-22a) the amount of refrigerant used for air conditioning can be reduced



▼ "Hiezo" refrigeration device that can maintain cold for 3 days at 0-5 degrees

▼ Example of introduction of photovoltaic power generation system

Effectiveness

Hydrocarbon refrigerant works in smaller quantities and with higher efficiency than alternative CFCs, reducing the load on compressors and **reducing the energy required for cooling**. The global warming impact of alternative CFCs is in the 100s to 1,000s in comparison to CO_2 at 1, while hydrocarbon refrigerant is as small as 3, so **the greenhouse effect when released into the atmosphere is extremely low in comparison with conventional CFCs**.

In addition, the introduction of solar power generation systems leads to a reduction of the amount of electricity derived from fossil fuels, contributing to **reduced greenhouse gas emissions**. Due to high construction quality, it is possible to generate electricity for a long time in a stable manner.

Applications

We have a track record of introducing hydrocarbon refrigerant in air conditioning equipment (home improvement stores, fitness clubs etc.). The "Hiezo" cold storage device is useful for transportation, keeping low temperatures for a long time. We have a track record of introducing large and small solar power generation systems. Please contact us if you have any inquiries.

Strengths

- **Hydrocarbon refrigerant with low global warming impact**

The use of non-fluorocarbons as refrigerants is proceeding due to the ozone layer depletion but the global warming impact of alternative CFCs is large, and the hydrocarbon refrigerant (HC-22a) is attracting attention as a next generation refrigerant. Our company is developing a full-service business from the operation and sale of hydrocarbon refrigerants to the construction and maintenance involved with introducing air conditioning equipment.

- **Developing "Hiezo" refrigeration device that can keep cold for 3 days at 0-5 degrees**

We are developing a device with a freezer that can cool and freeze materials with latent heat within a cooler box to -30 degrees, and where the cooler box can be removed if necessary for transportation together with the refrigerant piping coupler. This can be used for transporting refrigerated goods.

- **Abundant achievements in the design and implementation of solar power generation systems**

We are also involved in the design and construction of solar power generation systems and have a track record of introducing systems of various scales, from 100kW to several MW. We have a strong commitment to quality construction that can be trusted by our customers.

Energy

West Japan Engineering Consultants, Inc.

Harmonizing people and the environment, and contributing to the creation of a prosperous society

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eigyou-kanri@wjec.co.jp
(English）+81-92-781-6277/wjec_obd@wjec.co.jp
Major Overseas Bases
Jakarta Office (Indonesia)

One of our company's main pillars is contributing to the promotion of renewable energy towards a carbon-free society by 2050. As society undergoes major changes, we want to respond with the thinking that "change is an opportunity." (NAKAMURA Akira, President)

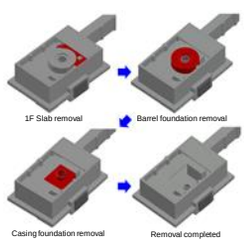
NAKAMURA Akira, President

Provision of **various consulting services** necessary for the **introduction of renewable energy power generation**

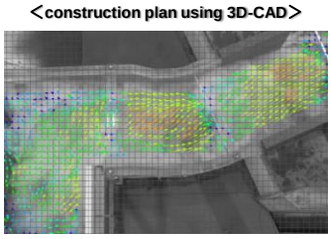
▼ Example of hydropower design work

＜investigation in a narrow waterway using a robot＞

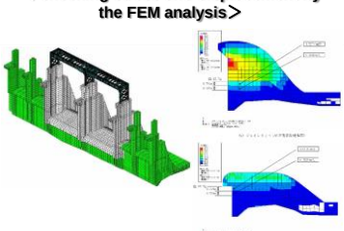
＜construction plan using 3D-CAD＞



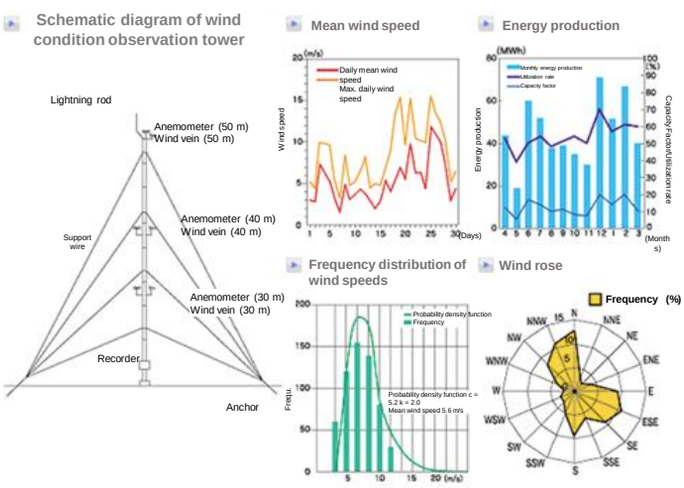
＜construction plan using 3D-CAD＞



＜ checking stress and displacement by the FEM analysis＞



▼ Example of wind observation at wind turbine planned construction site



Effectiveness

Our company has know-how on a wide range of renewable energies, including geothermal, wind, solar and biomass. We provide detailed consulting service both in Japan and overseas, according to the characteristics of each region. The spread of power generation using renewable energy aims to **control CO_2 emissions derived from fossil fuels and solve the problem of climate change**.

We also provide consulting services on the efficient operation of power plants, and can meet various needs, including the realization of **reductions in power plant operating costs** etc.

Applications

We provide consulting to government agencies and power generation companies considering the development of renewable energy such as geothermal power, wind power, solar power, biomass power and hydroelectric power etc.

Strengths

- **Providing a wide range of services, from upstream to downstream**

We can support preliminary surveys, power generation system planning and design, procurement, contracting, construction planning and management, site inspection, vocational training, financing, partner selection and power plant operation for the development of renewable energy. We provide a wide range of consulting services from upstream to downstream based our experience cultivated in Japan and overseas.

- **Consulting according to regional characteristics**

For wind power generation, we carry out wind observation at planned construction sites for wind turbines and landscape simulations for after the introduction of wind turbines, for biomass power generation we survey the properties and emissions of biomass resources, and for geothermal power generation we carry out geological surveys, geophysical exploration and geochemical surveys. We can investigate the characteristics of target areas and design and introduce optimal systems using the resources of the target area.

- **Abundant achievements in Asian countries**

We have a wealth of experience operating overseas in consulting such as on the formulation of geothermal power plant development plans in Indonesia, survey well excavation work supervision and production capacity evaluation in the Philippines, and hydroelectric power plant efficiency in Vietnam etc.

Energy

Riamwind Co. Ltd.

Development of renewable energy equipment that is easy to be accepted for people and the environment

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FS502 Kyushu University Global Innovation Center, 6-1 Kasuga-Koen, Kasuga, Fukuoka
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+81-92-501-8578/inquiry@riamwind.co.jp

The concept of our company is the development and provision of renewable energy equipment with high social acceptance. We already have a track record overseas through JICA projects etc. We hope to contribute to the development of areas in emerging countries and remote islands with poor power conditions where harmony with nature is valued, towards the realization of a carbon-free society.
(TOMINAGA Wakaki, General Affairs Department)

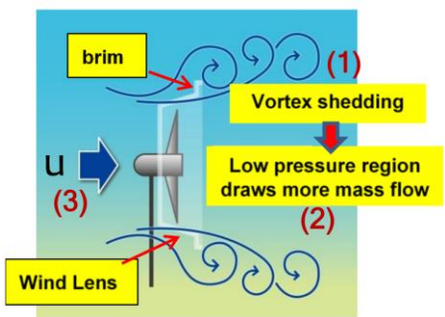
OHYA Yuji, President and CEO
(Specially Appointed Professor, Kyushu University)

Multi-lens wind turbines realizing high efficiency, low noise and large capacity

▼ Lens wind turbine

◀ Example of the introduction of a multi-lens wind turbine

Wind lens technology ▶



Effectiveness

"Lens wind turbines" are wind turbines with diffusers (wind collection lenses), which **allow highly efficient power generation in comparison with conventional wind turbines** and has the characteristics of being **super quiet**. Using a "multi-lens wind turbine" consisting of multiple lens wind turbines **makes it possible to increase power generation output** while maintaining quietness. With wind turbines that feature high efficiency, low noise and large capacity, this can also lead to the popularization of wind power generation and **contribute to the reduction of CO_2 emissions** derived from fossil fuels.

In addition, the lens wind turbines have design quality which helps maintaining the living environment and landscape of installation areas to popularize wind power generation.

Applications

This product can be used by government agencies or power generation companies that are considering the introduction of wind power generation. In addition to introduction in areas without power grid development or remote islands, these can be used as a power source for emergency generators when combined with batteries etc.

Strengths

- **"Lens wind turbines" utilizing wind collection lens technology**

"Lens wind turbines" are wind turbines with diffusers, developed together with Kyushu University. A large speed-up effect can be obtained near the entrance of the diffuser by creating a low-pressure region behind the diffuser from the Karman vortex that occurs due to the "collar" of the diffuser. Since wind energy is proportional to the cube of the wind speed, this makes power generation more efficient than conventional wind turbines. Also, aerodynamic noise is greatly reduced by cancelling the wing tip vortex that causes noise from the flow along the inner wall of the diffuser.

- **Increased output with multi-lens**

Overall output can be increased with the arrangement of multiple lens wind turbines (multi-layering). Output can be increased while maintaining the characteristics of the lens wind turbines, increasing output by 10% with three lenses and 20% with 5 lenses. The development of multi-lens wind turbines with even more lenses is being considered for the future.

- **Design that blends with nature**

We are proposing a "tree that collects the wind" design of wind turbine that blends into the landscape, with the aim of popularizing products that harmonize with nature.

Other

JMA Consultants Inc.

Achieving sustainable reductions to energy and material loss at production sites towards decarbonization!

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Kyushu Office: 10F Nihon Seimei Hakata Ekimae Building, 3-2-1, Hakata Ekimae, Hakata-ku, Fukuoka
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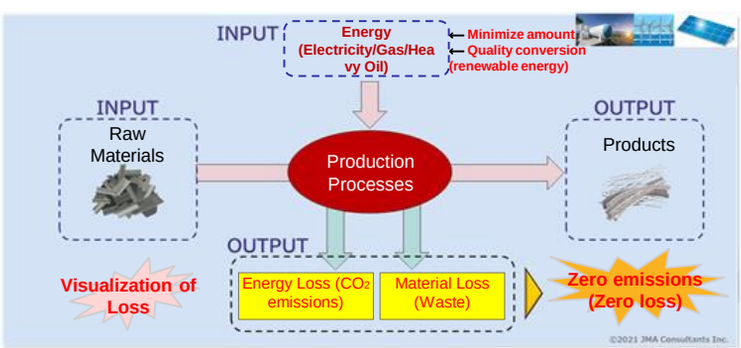
Major Overseas Bases
JMAC Thailand (Thailand)
JMAC China (China)

Our company is a management consulting firm with the longest history in Japan. We are developing consulting for companies and local governments to pursue concrete results through theory and practice for the global issue of decarbonization.
(EHARA Hiroki, Senior Consulting Planner, Business Development Office, Learning Consulting Business Unit)

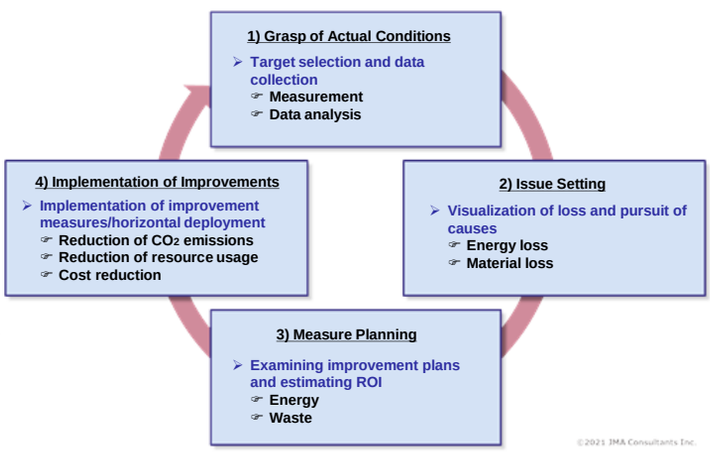
YAMADA Akira (left), EHARA Hiroki (center), SHIOBARA Yoshiyuki (right)

Realizing **energy saving, resource saving and low cost** in **production processes**

▼ Illustration of using MFCA



▼ Zero emissions MFCA cycle



Effectiveness

Using the proprietary Material Flow Cost Accounting (MFCA) proposed by our company, it is possible to not only quantitatively visualize material loss but also energy loss, allowing measures to be taken to reduce them. If various losses can be reduced, this leads to the **reduction of costs in the production process**.

Because of the reduction of material and energy loss, the savings in resources and controlled waste generation can be realized. It contributes to **improved resource efficiency and reduced waste disposal**, and energy savings contribute to the **control of CO_2 emissions**.

Applications

Our service is able to meet the needs to reduce costs, save energy and resource saving in the production process. We can also support data measurement for energy usage.

Strengths

- **Proprietary MFCA developed by our company**

Our company is working on the development of our own improved MFCA (ISO14051: Material Flow Cost Accounting), an environmental management method. Conventional MFCA focuses on the quantification of material loss, and the ability of this method to visualize energy flow and quantify energy loss make it a method suitable for the decarbonization era.

- **Proposing solutions in response to actual conditions on site**

We have a wealth of achievements in corporate management consulting, education and research. We can analyze actual situation on site and challenge by using MFCA. Based on the result, we can support for planning and the execution of practical solutions and achieving purposes and goals.

- **Also supporting data measurement**

It is possible to quantify energy loss by incorporating actual measurement data with proprietary developed methods. We are able to prepare devices for the measurement of energy usage. This makes it possible to understand the actual conditions of each process and equipment.

Other

Hasegawa Environment & Development Co., Ltd.

Technology capturing the needs of the world!

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Since our company began we have only handled thermal coatings for window glass, but given recent circumstances we began working on an antibacterial/antiviral treatment. We hope you will experience this latest in Japanese technology.
(OSHIMA Yasumasa, President and CEO)

OSHIMA Yasumasa, resident and CEO

Antibacterial/antiviral coating “Nanoscreen®”

▼ Working with the new product Nanoscreen

▼ Working with a conventional dedicated gun

Effectiveness

Coating with “Nanoscreen” is easy, you simply spray it onto a microfiber cloth and wipe it on just like cleaning. It is particularly effective in places that many people touch which have had to be frequently sanitized, such as electric switches and remote controls, phones, doorknobs, keyboards, chairs and the tops of desks etc. The big advantage is that **you can do full-scale coating yourself**.

This excellent product works 24 hours a day and is **always effective, even without light.** It **remains effective for 3-5 years** and also has **a deodorant effect**.

Applications

This is a product that meets the expectations of anyone looking for a real “coating that would cost a lot from a specialist but has a long-lasting effect.” It can be used anywhere, including educational sites such as schools, public transport, offices, hospitals, restaurants, banks, and post offices etc.

Strengths

- **Uses Non-photocatalytic “titanium phosphate”**

A product that seeks to be easy to apply, based on titanium phosphate developed by YOO Corporation. Utilizing the photocatalyst “titanium oxide,” which has demonstrative effectiveness against sunlight radiation (UV rays), as a starting material, this breakthrough non-photocatalyst demonstrates an antibacterial, antiviral and deodorant effect even in the dark by reacting with phosphoric acid.

- **Easy to apply with a long-term effect**

The coating is easily applied by simply switching your disinfectant for “Nanoscreen” and wiping it on just like cleaning or sanitizing. After it is cured, you can wipe it with alcohol or hypochlorite water and the strong inorganic film will maintain its effect.

- **Compatible with a wide range of materials**

It can be applied to a wide range of materials such as metal, wood, plastic, fibers and stone etc. A colorless and transparent liquid which is easy to store and can be used with peace of mind on any surface.