



Guidebook on Technologies of Environment-Related Corporations in Fukuoka Prefecture



Introduction

Sharing Environmental Technologies from Fukuoka to the World

–Aiming to solve environmental problems throughout the Asian region



Fukuoka mascot character "Ecoton"

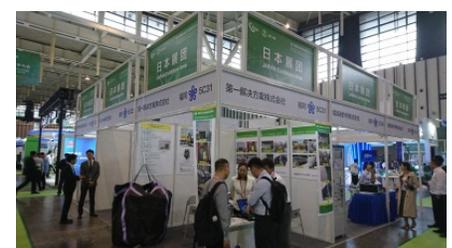
Fukuoka prefecture has accumulated achievements and know-how on overcoming environmental problems over many years and is now taking advantage of this strength to promote exchanges in the environmental field with the Asian region. In particular, we have provided technical cooperation, industrial cooperation 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.



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.

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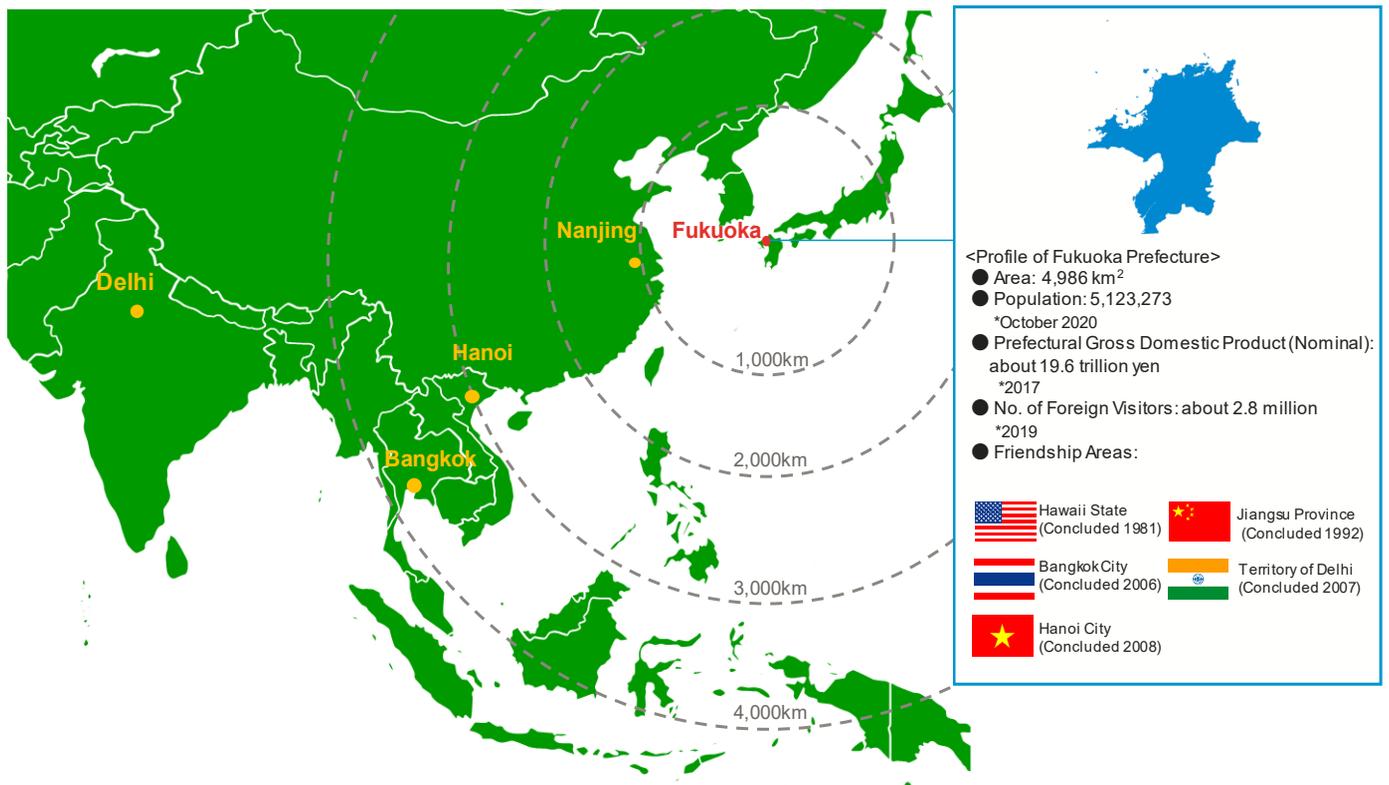
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About Fukuoka Prefecture

Overview of Fukuoka Prefecture

Fukuoka prefecture is located in the northern part of Kyushu, which is in the southwest of Japan. It is geographically close to the rest of Asia and has developed as an open gateway to Asia since ancient times. The area of the prefecture is about 5,000 km², and the population is about 5.1 million. The prefecture has two government ordinance designated cities, Kitakyushu, which is also a model SDGs city where industrial and environmental industries are concentrated, and Fukuoka City where commercial facilities are concentrated and wholesale and retail, and service industries flourish.



Experience Overcoming Pollution

During the period of high economic growth, Fukuoka prefecture faced a serious pollution problem due to the development of industry, and has experiences overcoming such problems. In response to the calls from residents to prevent pollution, residents, companies and government worked together to restore the comfortable environment of today. In the process of overcoming pollution, we have accumulated expertise and know-how regarding environmental technologies and the construction of infrastructure.



Omuta City in the 1950s (smoke flowing into the sky)



Omuta City today (the beautiful blue skies have returned)

Initiatives in the Environmental Field in Fukuoka Prefecture

Promotion of international environmental cooperation

We are promoting environmental cooperation with various Asian countries utilizing the environmental technologies and know-how accumulated in the prefecture through the process of overcoming past pollution issues, to contribute to the solution of environmental problems in the Asian region.

Under the “**Fukuoka International Environmental Management Program (FINE)**” has been implemented since 2006, we have invited government officials that are at the core of environmental measures from various Asian countries to our prefecture to carry out training on efforts to overcome pollution, environmental technologies, policy lectures and site visits etc. We have accepted 231 trainees as of 2019.

Also, under the “**International Environmental Cooperation Project**” we are implementing various environmental cooperation projects utilizing the human network that we have built through international environmental human resource development projects etc.

In Hanoi, Vietnam and Sikhio, Thailand we provided technical support for the introduction of the “**Fukuoka method (semi-aerobic landfill method) waste disposal sites**” for environmentally friendly waste landfill.

In Bangkok, Thailand, we have supported environmental education which was an important issue to Bangkok City through cooperation in the creation of the Bangkok version of a reader for environmental education, with reference to the prefecture’s own environmental education reader.



Fukuoka International Environmental Management Program (FINE)

Invited countries (past)

China, Thailand, Vietnam, India

Content

Lectures and site visits etc.

- General environmental management (waste treatment, water and air conservation etc.)
- Environmental education



Solving environmental problems in the Asian region



Building a human network in the environmental field



The Fukuoka method waste disposal sites

Issues at disposal sites

Odor from landfill

Mass generation of methane gas

Highly polluting leachate

The Fukuoka method disposal site



▲ Suppression of the generation of methane gas by aerobic bacteria due to ventilated structure of landfill



Suppression of odor and methane gas generation



Purification of leachate



Early use of landfill sites



Environmental Education

- Creation of a supplementary reader for environmental education in Bangkok referring to the prefecture’s environmental education reader
- Conducted invited training for elementary school teachers that have started environmental education

▼ Bangkok City Environment Readers



▼ Environmental education at an elementary school in Bangkok



Inquiries regarding international environmental cooperation:

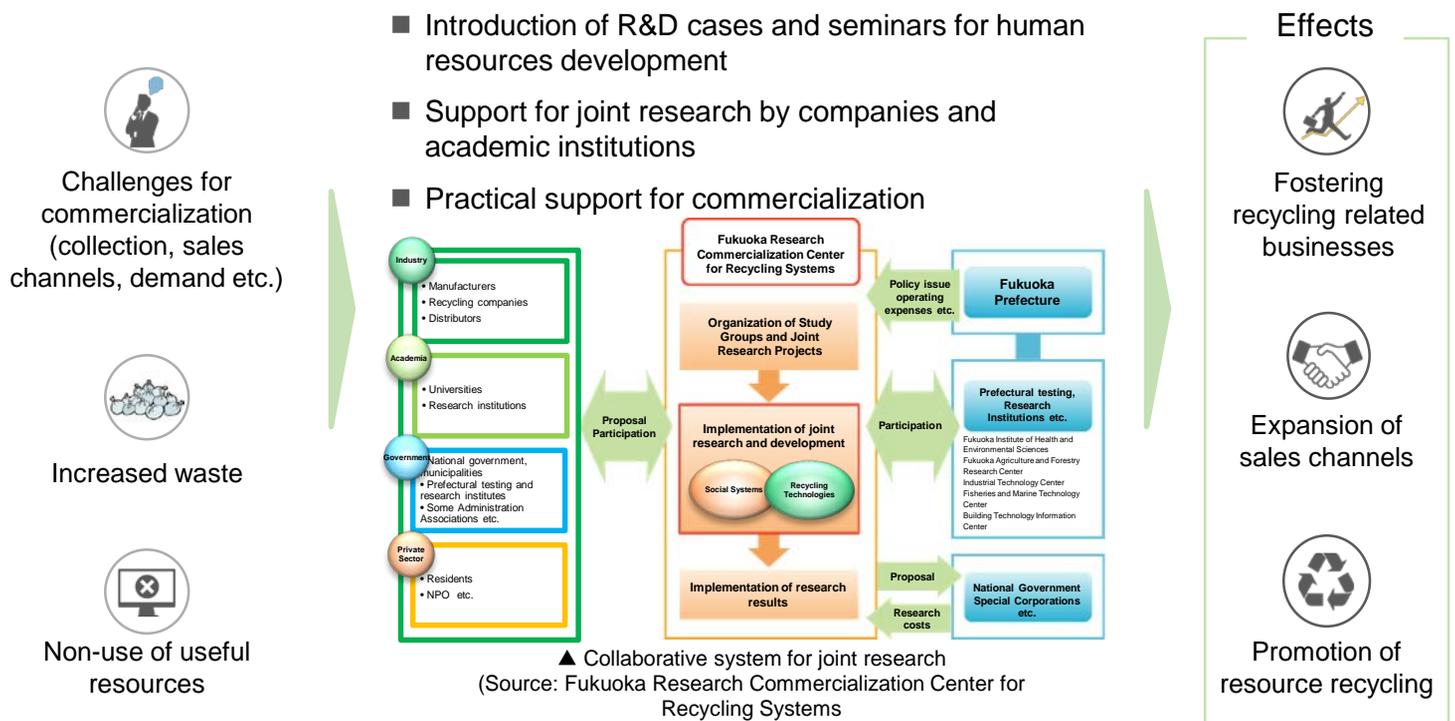
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Department of the Environmental Affairs, Fukuoka Prefecture

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Promotion of a recycling-oriented society and circular economy – Construction of a recycling system integrating industry, government and academia

With the aim of promoting the recycling of resources and the reduction of waste, beyond simply the development of recycling technologies, we are promoting the development of a resource recovery system at the “Fukuoka Research Commercialization Center for Recycling Systems”, supporting sales channel expansion, and supporting the spread and expansion of the prefecture’s certified recycled products.

Fukuoka Research Commercialization Center for Recycling Systems



Recycled Product Certification System



■ Forming living environments for a healthy and comfortable life – Conservation of water and atmospheric environments

We have formulated “sewage treatment principles” for the conservation of the water environment in the prefecture and advance effort to promote the dissemination of processing equipment and to pursue sustainable and efficient operations management. Regarding the conservation of the atmospheric environment, we are conducting air environment management through **monitoring**, and are **researching fine particular matter (PM_{2.5})** through the Fukuoka Institute of Health and Environmental Sciences. Through such measures, we aim to create a healthy and comfortable living environment.



Maintenance of Sewage and Septic Tanks according to Fukuoka Sewage Treatment Principles



Regional differences in spread of sewage treatments

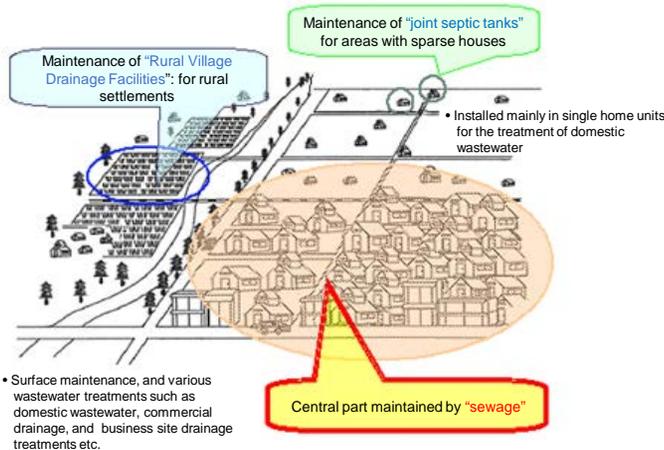


BOD/COD measures for river and sea areas



Aging and declining operating rates of sewage treatment facilities

- Formulate “sewage treatment principles” and disseminating these to sewage treatment facilities to promote efficient management
- Promoting the introduction of low-cost maintenance methods, the introduction of septic tanks, the optimization of sewage treatment facility sites, activities to raise awareness of residents and the introduction of public-private partnership initiatives etc.



Effects



Increased sewage treatment population penetration rate



Improved water quality in public water areas



Renewal of sewage treatment facilities



Air Pollution Monitoring and Survey/Research

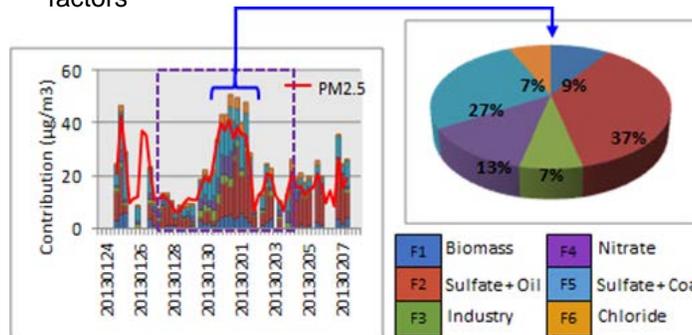


Health damage caused by photochemical oxidants and PM_{2.5}



Air pollutants crossing international borders

- Constantly monitoring the air pollution status in the prefecture at monitoring and measurement stations
- Understanding the components of PM_{2.5} by component analysis and analyzing occurrence factors



Analysis of the contribution rate of occurrence factors (Fukuoka Winter 2013)

Effects



Promotion of countermeasures based on factors that occur



Improvement of living environment

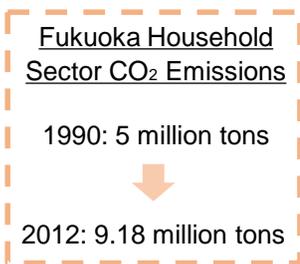
■ Transitioning to a carbon-free society – Promotion of energy saving

We are promoting measures in the prefecture for the introduction of energy saving equipment and the realization of an energy saving lifestyle with the **"Eco-Family Support Program"** in the household sector, supporting energy saving for the transition to a carbon-free society. In the business sector, we are promoting the efforts of business through subsidies for the introduction of energy saving equipment under the **"Energy Measures Special Loan System"** and the **"Eco Companies Support Program"**.

Household Sector – Eco Family Support Program



Increased emissions in the household sector



- Registration of homes engaged in energy saving and resource saving as "Eco Families"
- Supporting an eco-friendly life with the "Environmental Household Budget Book" and smartphone app, granting benefits and awards for efforts



▲ Fukuoka Prefecture Environmental Household Budget Book



▲ Eco Family Support App

Effects



Fostering a consciousness of preventing global warming



Promotion of action at home

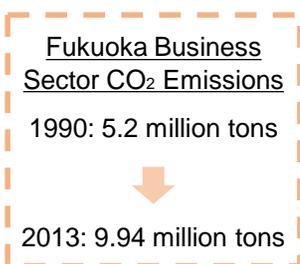


Reduction of CO₂ emissions

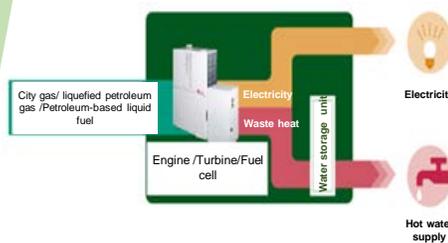
Business Sector – Subsidy for the Introduction of Energy Saving Equipment and Promotion of Efforts



Increased emissions in the business sector



- Implementation of low interest loans to promote energy saving, the introduction of cogeneration and the maintenance of hydrogen stations etc.
- Registration of businesses working to reduce electricity or gas usage as "eco-companies" and implementing preferential bids, awards and PR etc.



▲ Mechanism of cogeneration



▲ Eco-companies sticker

Effects



Promotion of investment in energy saving



Promotion of action by businesses



Reduction of CO₂ emissions

■ Transitioning to a carbon-free society – Promotion of renewable energy

Through the provision of the “Fukuoka Prefecture Renewable Energy Introduction Support System” for companies considering the introduction of renewable energy etc., and the dispatch of “Fukuoka Prefecture Renewable Energy Introduction Support Advisors” etc., we are promoting the introduction of renewable energy to improve the environment. Also, the “Fukuoka Prefecture Energy Utilization Model Construction Promotion Program”, supports the introduction of renewable energy utilizing local resources by municipalities etc., and the construction of a local production-local consumption energy model utilizing regional characteristics.



Support for the Introduction of Renewable Energy



Increased thermal power generation output



Barriers to introduction and lack of information

- Provision of the “Fukuoka Prefecture Renewable Energy Introduction Support System”
- Dispatching experts to companies considering the introduction of renewable energy and implementing the “Fukuoka Prefecture Renewable Energy Introduction Support Advisor Dispatch Program”
- Active introduction at prefectural facilities



▲ Introduction of solar power generation at Fukuoka Prefecture Dazaifu schools for special needs education

Effects



Increased introduction rate of renewable energy



Promotion of introduction consideration by private operators



Reduction of CO₂ emissions



Construction of a Local Production-Local Consumption Energy Model



Need for self-sustaining and distributed energy



Challenges for the development and dissemination of new technologies

- Granting of subsidies under the “Fukuoka Prefecture Energy Utilization Model Construction Promotion Program”
- Supporting biomass power generation using city waste and small hydroelectric power generation for dams and farmlands etc. and municipalities working on model building utilizing renewable energy sources



▲ Miyama City Biomass Center “Refrain” (Source: Miyama City)

Effects



Diversification and decentralization of energy sources



Regional promotion



Reduction of CO₂ emissions



ECOWOOD Co. Ltd



Company website

The only production plant in the western Japan carrying out the “Regeneration of limited resources”

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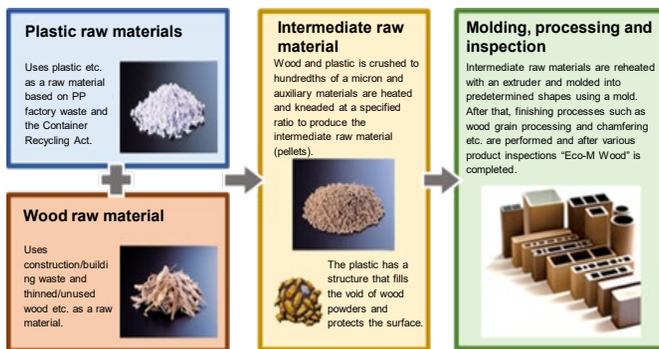
There is a connection between the SDGs that the world is aiming to achieve and our own Corporate Philosophy. ECOWOOD continues to manufacture products with a focus on the environment, quality and technology to realize our Corporate Philosophy. (ISHIMOTO Koji, President and CEO)



ISHIMOTO Koji, President and CEO

“Eco-M Wood,” a wood building material that uses unused wood and waste plastics as raw materials to continue to evolve coexistence with wood

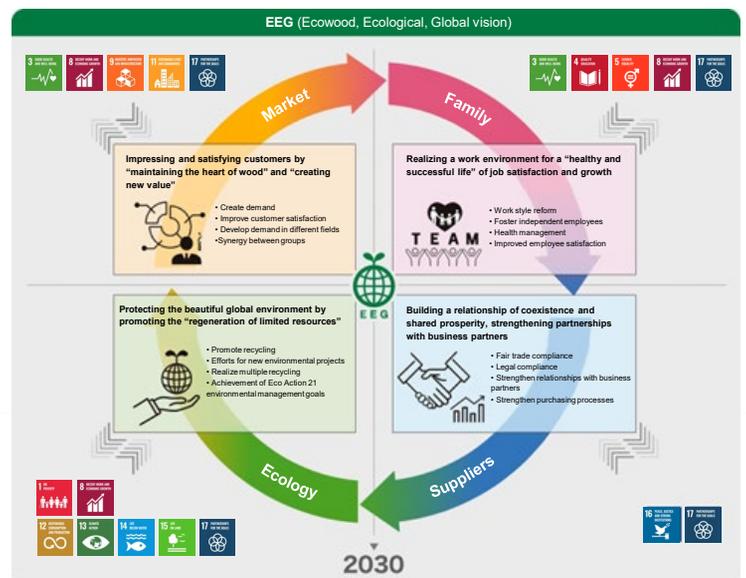
▼ Eco-M Wood manufacturing method



▼ Examples of product use (decking, benches etc.)



▼ Achievement of Sustainable Development Goals



Effectiveness

“Eco-M Wood” is a building material that utilizes used plastic and unused wood and by **promoting the effective use of resources**. This product contributes to the reduction of the amount of timber harvested and **the conservation of forests**.

Also, by using used plastic, **the emission of CO₂ from the production of raw materials derived from natural resources can be reduced by 92%** and using this product on a wooden deck can **reduce CO₂ emissions by about 41% over the total lifecycle**.

In addition to being environmentally friendly, it also has high performance equivalent to or better than natural wood in terms of strength retention, antiseptic properties, water absorption and termite repellency, so that customers can **use it long-term with confidence**.

Applications

This product can be used as construction material for decking, louver fences and benches in various facilities such as parks, schools and government offices. Our commitment to the environment, quality and technology is highly valued by many customers.

Strengths

● **Using this product to improve environmental issues**

Eco-M wood utilizes wood and plastic that is not being effectively used and has a recycled material content of over 90%. The local production and local consumption of resources can also be achieved by regenerating aged decks and existing wood.

● **Quality backed by a wide range of certifications**

We continue to work and make improvements to produce homogeneous and high-quality products that customers can use with confidence. We also carry out thorough quality control and have obtained official certifications and authorizations such as ISO9001, JIS Mark Display Product, and Fukuoka Prefecture Certified Recycled Product.

● **High planning and technical capabilities to meet customer needs**

For almost 20 years we have been adding new functions depending on the application, while maintaining a commitment to the texture of wood. We have demonstrated high planning and technical capabilities providing products that meet the needs of our customers, with weight reduction by foaming the core layer, the pursuit of realistic wood grain, the realization of high weather resistance, combining with aluminum to make it lightweight and high strength, and improving heat shielding and charge suppression.



Waste

Eco-Stage Engineering Co., Ltd.



Using waste as a highly valuable resource

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Major Overseas Bases

Active in morocco

From 2019, our company began a JICA ODA project for the installation, and dissemination/demonstration operation of a small plant as a resource recycling device for olive oil lees in the Kingdom of Morocco. We have high expectations that this will be a stepping stone to future overseas opportunities. (NAKAZONO Eiji, President)



NAKAZONO Eiji, President

“Oil temperature vacuum drying technology” turning organic waste into valuable resources!

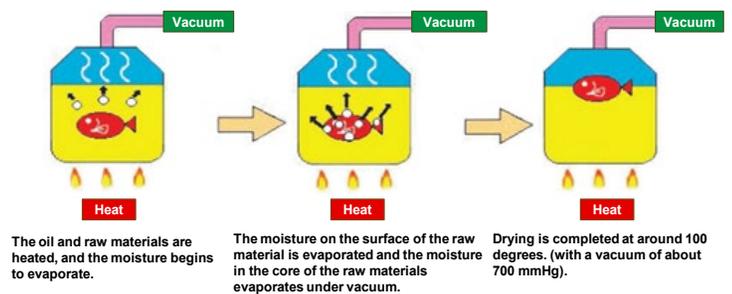
▼ Oil temperature vacuum dryer (cooker)



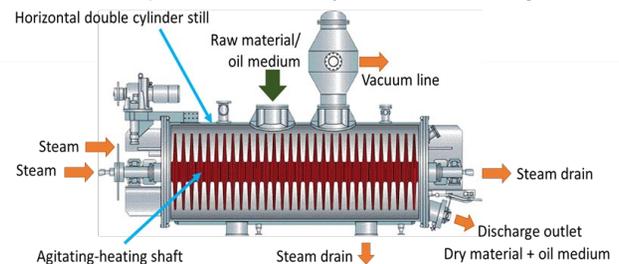
Dried olive pomace (can be used as feed or fuel) ▶



▼ Principle of oil temperature vacuum drying technology



▼ Oil temperature vacuum dryer structural drawing



Effectiveness

“Oil temperature vacuum drying technology (Tempura method)” is our company’s patented technology to use waste cooking oil as an indirect heating medium to mix and heat with organic waste to evaporate the moisture inside of objects to be treated at about 85-110 degrees while lowering the boiling point by reducing the pressure inside the device to about 0.6 atm.

Since waste cooking oil is dried using the “frying” method, there is a uniform amount of waste cooking oil in products after processing, attaching new added value (increased heat) not found in normal drying technologies, allowing this value to be sold or reused. This makes it possible to **produce fertilizer and feed from food waste and fuel from sewage sludge.**

Applications

We can produce resources (feed, fertilizer, fuel) from any kinds of organic waste, including marine products, agricultural products, livestock products, sewage sludge and kitchen waste by drying.

Strengths

● Dried under uniform vacuum

Because the oil in the objects to be treated penetrates sufficiently and then dries, the moisture content distribution in the product is uniform after drying. In addition, by processing under a vacuum the evaporation of moisture is promoted, making for highly efficient and rapid drying. There is also no unpleasant odor derived from the object released outside of the system.

● High value-added use of waste

In the case of food waste, we collect as much organic matter as possible and sterilize it at the same time. In addition, if there is a lot of oil in the objects to be treated the oil is eluted during processing and can be reused as medium oil.

● Achievements with food waste processing and recycling

In Japan, this technology is used in processing and recycling factories operating with organic waste such as food waste and sewage sludge with a high moisture content. In 2019, we began a local dissemination/demonstration project to recycle and reduce the environmental load of olive oil lees in Morocco.



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 CO₂ 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)



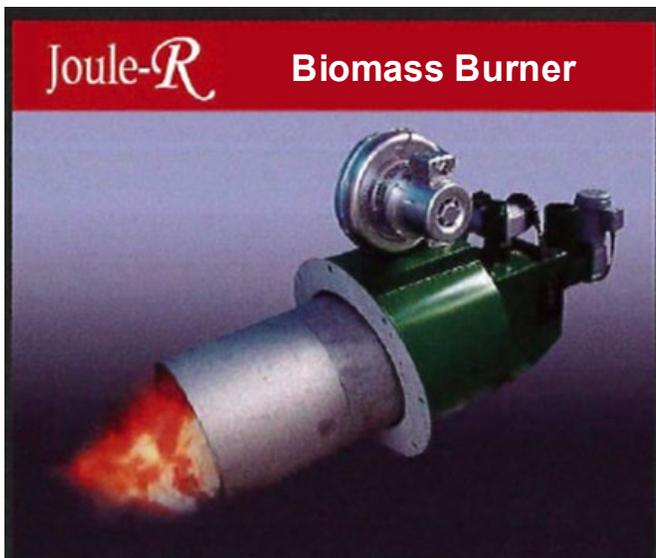
NAKAMURA Yasuyuki, Representative Director



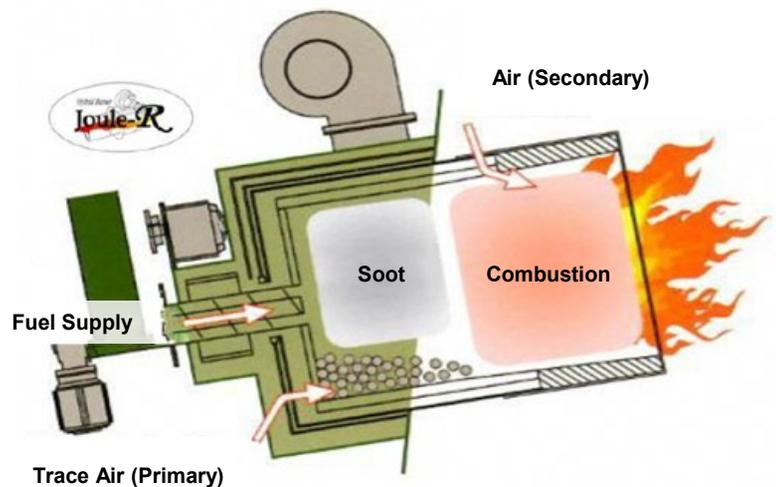
YAMADA Yoshito, Representative Director

“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 CO₂ 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.



Otani Chemical Industries Co., Ltd.



Working towards the implementation of resource recycling to eliminate environmental pollution!

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Major Overseas Bases
GENCO OTANI Co. Ltd (Thailand)

As “environmental conservation” professionals, we aim to build an “environmentally friendly” resource recycling system that not only effectively circulates resources contained in waste but doesn’t generate new environmental loads.
(OTANI Katsumi, President and CEO)



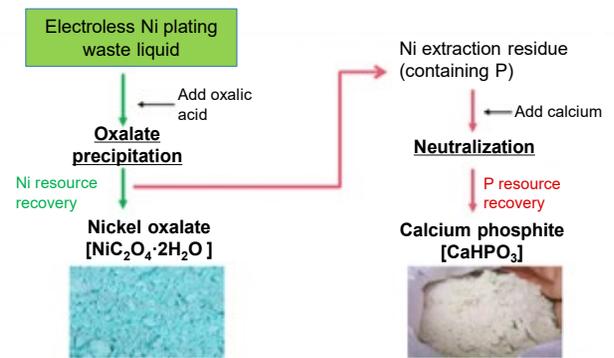
OTANI Katsumi, President and CEO

Nickel and phosphorous recovery from electroless nickel plating waste liquid

▼ Appearance of electroless nickel plating waste liquid recycling plant



▼ Oxalate precipitation recycling method flow



▼ Recovered fertilizer component quality (Units: mg/kg)

Harmful Components	Ni	As	Cd	Pb	Cr	Hg	Ti
Fertilizer Control Act	≤ 50	≤ 20	≤ 0.750	≤ 30	≤ 500	≤ 0.50	≤ 200
Our Standard	≤ 35	≤ 14	≤ 0.525	≤ 21	≤ 350	≤ 0.35	≤ 140
Analytical Value	≤ 15	ND	ND	ND	ND	ND	ND

Effectiveness

By recovering nickel and phosphorous from electroless nickel plating waste liquid, this can **reduce secondary environmental load** and contribute to the **effective use of resources** compared to simple neutralization. Nickel is an indispensable raw material for lithium-ion batteries as the further expansion of electric vehicles is expected, and the improvement of recycling technologies will be further required. The collection and recycling of phosphorous not only **provides for eco-friendly fertilizer raw materials**, leading to the prevention of the eutrophication of river basins and ports and the **conservation of water environments**.

We are working for **assured and trusted waste liquid treatment and resource recovery** for customers based on advanced plating waste liquid treatment technology and highly accurate analysis and evaluation know-how.

Applications

We propose solutions for companies that have trouble processing electroless nickel plating waste liquid which are expected to reduce processing costs while making effective use of resources. We have abundant expertise in the processing of waste liquids containing precious metals and harmful special waste liquids, and the recycling of precious metal scrap.

Strengths

● **High nickel recovery rate by the extraction/precipitation method**

The solvent extraction method originally developed by our company or more commonly used oxalate precipitation method can be chosen, depending on the generation of electroless nickel plating waste liquid, and in either case the nickel in the waste liquid can be collected with a high extraction rate (about 98%). In Thailand we have a processing plant capable of processing up to 20m³ per day.

● **Recovery of phosphorous resources as fertilizer raw materials**

After nickel recovery, the residual liquid contains a large amount of phosphorous. Phosphorous is a valuable resource but can also lead to the pollution of oceans and rivers when excessively excreted into the environment, and we have the technology to collect this phosphorous as a raw material for fertilizer. We supply fertilizer raw materials that can be relied on, meeting our standards that are stricter than Japanese fertilizer raw material standards.

● **Realization of quick response by Thai subsidiary**

We have established a joint venture with GENCO in Thailand, allowing a quick response utilizing the local network. We also plan to focus on waste liquids containing precious metals and precious metal scrap recycling based on processing and analysis technologies cultivated since establishment.



Kakuno Manufacturing Co., Ltd.



Solving both global warming and organic waste treatment with virtual zero CO₂ emissions!

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+81-979-82-3888/

ceobrain1618@kakuno.page

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 CO₂ 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°C	800°C	800°C
By-product	Para-metals	Charcoal	Charcoal
Volume reduction	1/200-1/500	1/10-1/40	1/10
CO ₂ 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: CO₂ 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. CO₂ 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 CO₂ 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 CO₂ 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 CO₂**
 Conventional incinerators emit a large amount of CO₂ from their combustion and the disposal of incineration ash is also costly. Pyrolyzers process under anoxic conditions, so there are none of the CO₂ 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.



Kyushumetal Industry Co., Ltd.



Contributing to a sustainable resource circulation with the thorough recovery of resources

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+81-93-582-6143/kms@kms.nnr.co.jp

Our company is trusted by stakeholders in our work for the proper processing and supply of high quality recycled resources, contributing to the sustainable recycling of resources. The products and services of Kyusyu Metal Industry are created using various resources. We see it as our responsibility to not only efficiently utilize the limited resources of the earth, but also to contribute to the realization of a sustainable recycling economy. We are also actively working on material recycling to deal with the plastics problem that has been gaining attention in recent years. (SHOZAKI Hideaki, President)



SHOZAKI Hideaki, President

Achieving a high resource recovery rate with a proprietary crushing and sorting process

▼ Main shredder (2,000-horsepower)



▼ Mixed metal continuous sorter

A device that can separate metals with specific gravity by fluidizing power sending air from the bottom of filled powder.



Effectiveness

By shredding metal scrap and end-of-life products (home appliances and cars) and utilizing our technology and know-how to recover resources, we promote the proper treatment of waste and the recovery of iron and major non-ferrous metals and improve the **resource recovery rate**.

In addition to the shredding of metal scrap and the recovery of iron and major non-ferrous metal resources, we also have the technology and know-how to collect various valuable metals such as rare metals from the discharged shredder dust. This allows us to contribute to **the achievement of a high resource recovery rate and the improvement of recycling**.

Applications

We can provide technical cooperation on the processing and recycling of metal scrap and end-of-life products (home appliances and cars). We also accept consultations from government officials considering various recycling systems.

Strengths

● **Shredder plant with high processing power**

We have a large number of recycling facilities, including a 2,000-horsepower shredder plant for the processing of iron scrap etc. We also combine certain crushing and sorting technologies depending on the type of object to be processed, to increase added value for produced iron (steel) raw materials and non-ferrous refined raw materials.

● **Recovery of non-ferrous metals from shredder dust**

We have collection technologies and know-how for various valuable metals from shredder dust. In addition to achieving the recovery of high-value metals with our unique processes that combine selection and sorting devices such as heavy liquid sorters and dry fluidized-bed specific gravity sorter/mixed metal continuous sorter etc. and hand sorting.

● **Responsible waste treatment**

We have a wealth of experience in metal scrap and used home appliance/scrapped car processing businesses in Japan, and we take responsibility for the proper processing of waste. (ISO14001 certified authorized operator)



KURINKA Co., Ltd.



Contributing to sustainable development with natural and breathable pavement!

Contact Address

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 +81-940-36-9763/info@kurinka.com

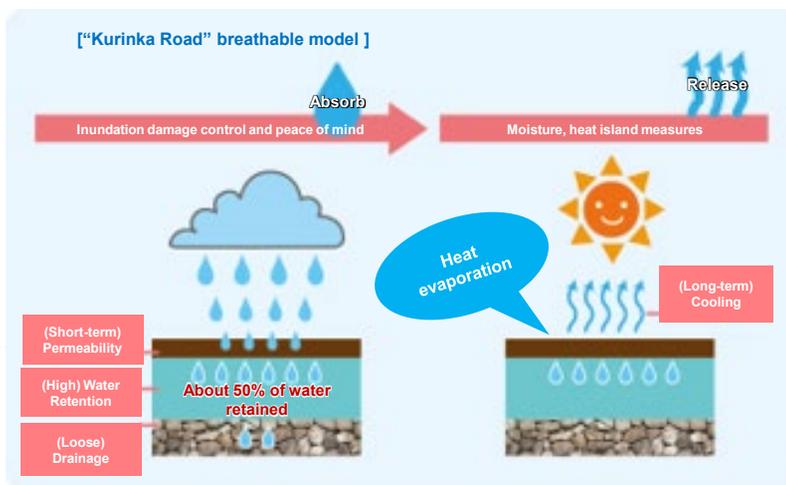
Our company promotes “local production, local consumption model” for coal ash. We are currently promoting this together with local partner companies in the Kanto, Chugoku and Okinawa areas. This model can also be expanded overseas, and we are actively moving into countries centered in East Asia. (UMEKI Shinichi, Representative Director)



UMEKI Shinichi, Representative Director

“KURINKA Road,” a highly permeable water-retaining pavement created from coal ash

▼ “Kurinka Road” water permeability and water retention mechanism



▼ Examples of construction for sidewalks and slopes etc.



Effectiveness

Our paving material is manufactured from coal ash generated from a coal-fired power plant, contributing to **the effective use of resources and the reduction of waste landfill disposal**. Also, by combining a permeable layer and water retention layer, it is effective for **landscaping and drainage measures** by preventing puddling and as **a measure against the heat island phenomenon and topsoil outflow**.

Also, like regular pavement, it is effective for weed control, allowing you to maintain a beautiful landscape.

Applications

The main raw material of this product is coal ash, so please contact us if you are looking for an effective use for coal ash, including coal-fired power plants. Also, “Kurinka Road” can be adopted in areas where there are squalls and heavy rainfall in a short period of time as landscape conservation and disaster measures for sidewalks and slopes from the high drainage and water retention functions.

Strengths

● **Effective use of coal ash generated from a thermal power plant**

Using coal ash (clinker ash) generated from a coal-fired power plant as the main raw material, we produce good quality road paving materials from waste. We have achieved highly functional and stable quality with the optimal formulation of solidifying agents and enhancers for environmentally-friendly pavement which doesn't adversely impact surrounding plants and animals.

● **Realization of comfortable road surfaces due to high permeability**

The permeable payer is constructed with coal ash and epoxy resin, giving it very high water permeability. This feature maintains a comfortable road surface that is easy to walk on by allowing rainwater to quickly seep down without creating puddles.

● **Water retention to prevent the heat island phenomenon and disasters**

The high water retention effect of the water retention layer, which consists of coal ash and a solidifying agent is also a useful measure against the heat island phenomenon, lowering road surface temperatures by about 7-10 degrees. Also, because it allows the water to penetrate gently after it has been retained, as well as being used as a drainage measure to deal with the risk of topsoil outflow due to rainwater erosion it can also be used in places where it is difficult to lay drainage ditches.



KENKI Corporation



Achieve easy, safe, reliable and inexpensive drying with high technical capabilities!

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 3-9-7 Kamimuta, Hakata-ku, Fukuoka
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 +81-92-411-1203/info@kenmori.com

The continuous low temperature Kenki Dryer, with 11 patents in 8 countries*, is capable of drying adhesives and sticky materials that can't be dried by other companies. We currently have distributors in France, Taiwan and Russia, but are also looking for partners in other areas.
 *Patented Countries and Regions: Japan, USA, Canada, UK, France, Germany, Switzerland, Taiwan
 (MORIYAMA Hideyuki, President and CEO)



MORIYAMA Hideyuki, President and CEO

Continuous low temperature dryer utilizing internationally patented technology

▼ Example and internal structure of a continuous low temperature “KENKI DRYER” drying device

KENKI DRYERS CONTINUOUS SLUDGE & PASTE DRYERS

Steam Heated Twin Screw (SHTS)Technology

Sewage sludge input amount 100kg/h (80% W.B.)

Running in Poland (World-first)
 Movable 40-feet-container system

HIGH EFFICIENCY

- Indirect steam heating no ATEX
- Compact
- 24-hour continuously working
- Low energy consumption

LOW TEMPERATURE

- Low maintenance
- No component change
- Very low VOC emission

NO ADHESION

- Specially designed for sludge and slurry
- Self-cleaning screw design
- No adhesion & No dogging
- Global patent

MR.DRY ALL

Adhesion(Silicate Calcium)

80% → 10%

Sticky(Sewage sludge)

80% → 10%

Solid(Pigment)

85% → 10%

Powder(Aluminium)

80% → 10%

SEWAGE SLUDGE, DIGESTAT, FOOD WASTE, MINERALS
 INDUSTRIAL SLUDGE, CHEMICALS, ...

Effectiveness

The amount of waste generated can be reduced by drying dehydrated sludge and organic waste discharged from water treatment facilities, and livestock manure etc.

Recycled raw materials (fuel, feed, fertilizer etc.) can be recovered after drying, which not only contributes to **the effective use of resources** but by combining with a pyrolyzer gas and oil can be collected and this can also be expected to **reduce greenhouse gas emissions**. It can also be used for adhesive and sticky materials, and it is also possible to dry raw materials with a moisture content of 90% or more to 2% or less (depending on the application and the properties of the raw material).

Applications

This technology can be used for drying for sewage treated sludge and production processes/wastewater treatment processes for various industries (automobiles, chemicals, semiconductors, food etc.). This can have a significant effect on waste reduction and the reduction of running costs by efficient drying, so please contact us if you have any problems with sludge treatment etc.

Strengths

● **Adopts an original adhesion/agglomeration prevention mechanism**

Adhesive raw materials are dried while separating and stirring them with a blade, and through repeated crushing the agglomeration of the coagulant in sludge can be prevented. This allows for the stable processing of adhesive and sticky raw materials (sludge, organic waste, slurry etc.) without problems.

● **Realizes highly efficient drying with low pressure steam**

The latent heat when low pressure steam turns into liquid is 2-5 times the sensible heat, and by drying with latent heat improved efficiency and miniaturization of dryers can be achieved. The drying temperature can be adjusted with steam pressure allowing for drying at even low temperatures (100 degrees or below), reducing water content without changing the composition of organic waste.

● **Improved production efficiency by operating continuously 24 hours a day**

It can be operated continuously for 24 hours, and by combining with a continuous pyrolysis device, solid fuel and soil conditioners can be collected using 100% of sludge energy etc.



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

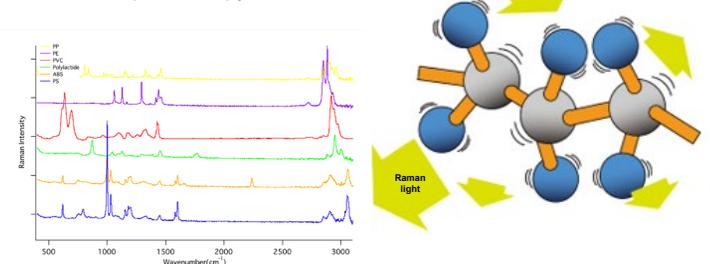
▼ External view of Raman plastic sorting device



▼ 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.



Sakai Kogyo Co., Ltd.



Expanding business from multiple angles along with life cycle of buildings

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My grandfather made Jojima roof tiles. He would ride a bulldozer to collect good quality soil in it to use as the raw materials, and then knead it, shape it, and bake it in a kiln. I would go with him in the middle of the night to check on the temperature of the kiln... The times have now turned to recycling rather than manufacturing. We want to focus on what we can now do with valuable limited resources. (SAKAI Aya)



SAKAI Aya

Improving road surface environments with recycled waste tile “roof chips”

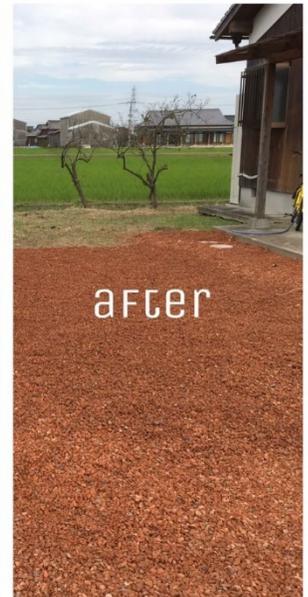
▼ Example of using “roof chips”



▼ Bags of “roof chips” for sale



▼ Before and after application of “roof chips”



Effectiveness

“Roof chips” are a recycled product (particle size adjusted crushed stones) which reuses waste roof tiles (good quality clay baked pottery tiles and smoked tiles) and can be spread on the surface of roads or sidewalks instead of crushed stone or gravel. The roof chips produced from the porous materials of roof tiles are characterized by high water retention and permeability.

Due to its low thermal conductivity, **the road surface is about 5 degrees lower than that of asphalt roads**, and aside from its effectiveness at suppressing the heat island phenomenon it also improves drainage with its excellent water permeability. It also has **the effects of weed control and preventing mud**.

Applications

It can be used in various situations in addition to roads and sidewalks, including parks and gardens. Because its effects of improving drainage and preventing muddiness it is also suitable for use in places susceptible to rainwater. It can also be used in homes for security measures and weed control.

Strengths

- **Use by spreading on road surfaces instead of gravel**

In addition to demonstrating the effects of water retention and water permeability which are characteristic of roof tiles, they are also lighter and easier to handle than stone or gravel, and because of their natural reddish brown or smoked coloring they fit well on road surfaces and in the garden. They have been introduced in parks, schoolyards, parking lots, flowerbeds and service areas etc.

- **Can buy small bags in retail for spreading**

We can sell roof chips in small bags (e.g. 12 kg bag), and also support large quantity sales. The company has also applied our experience and know-how in construction and civil engineering in the development of “roof chips” .

- **Contributing to the solving of environmental issues by effectively using waste roof tiles**

“Roof chips” are recycled waste roof tiles that would previously have become landfill, recycled into an added value resource. As the original roof tile manufacturer, we have utilized our expertise to develop this new application of “roof chips” to more effectively utilize waste roof tiles.



Genuine R&D Co., Ltd.



Discovering and developing functional ingredients and providing genuinely reliable products!

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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)

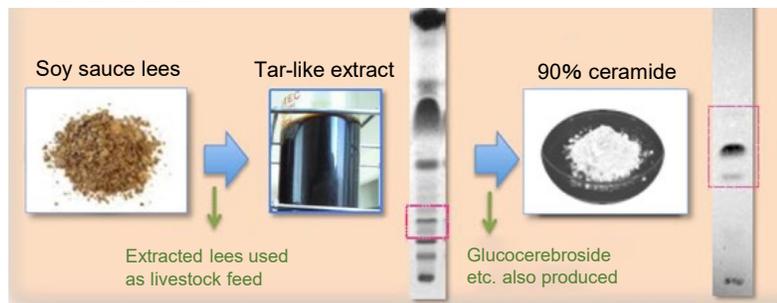
*GMP (Good Manufacturing Practice): Third-party certification for health food manufacturing and quality control



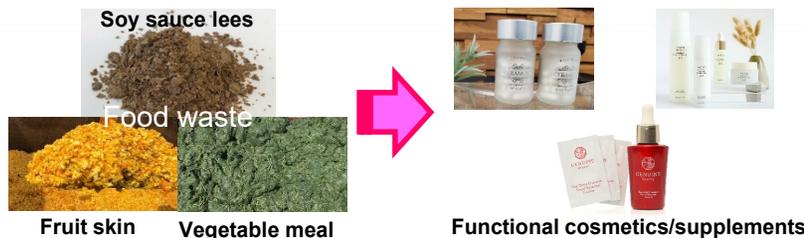
MIYANABE Masakatsu
Representative Director

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

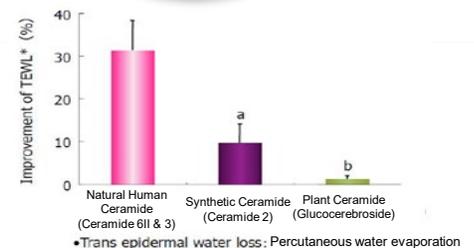
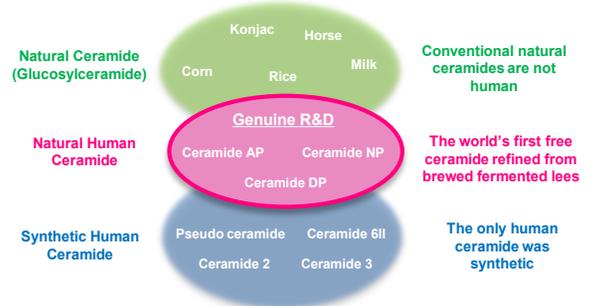
▼ Advanced utilization technology focused on the production of natural human ceramide



▼ Manufacture of functional cosmetics and supplements utilizing food waste



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



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.



General Incorporated Association Resource Circulation Network



Solutions for the entire recycling system based on abundant achievements and networks!

Contact Address

Inside the Asian Center for Low Carbon Society, 1-1-1 Hirano, Yahatahigashi-ku, Kitakyushu

Telephone/Email

+81-93-616-8155/info@trace-recycle.or.jp

We were founded as a “traceability certification body” based on the need for proper information management in recycling logistics. We currently provide solutions and services utilizing various consulting and information systems. (HAYASHI Takamasa, Representative Director)



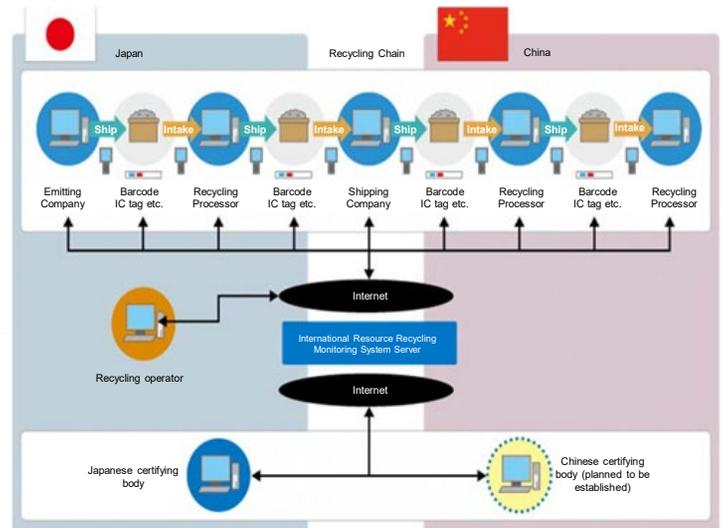
HAYASHI Takamasa
Representative Director

Visualization of recycling business and revitalization of the waste treatment industry

- ▼ Provision of various support services specialized in the areas of the environment and resource recycling



- ▼ Example of an information management solution (International resource circulation traceability system between Japan and China)



Effectiveness

Managing logistics information in waste processing and recycling and making it traceable **ensures the transparency and reliability of waste processing and recycling businesses.**

Also, the management of information eliminates the waste in logistics and realizes **increased efficiency.**

The service that we provide develops recycling business and **promotes control of illegal waste dumping and improvement of recycling rates, contributing to the realization of a recycling-oriented society.**

Applications

We propose optimal solutions for emitting operators and local governments, and waste treatment/recycling companies aiming to improve services through information management. We also have a track record of initiatives for the sophistication of waste treatment and recycling in cooperation with government.

Strengths

- **Realization of information management for recycling logistics**

We provide a traceability system using barcodes to manage logistics related to recycling, both within Japan and overseas. Our system is proving useful for the international circulation of resources between Japan and China, and the management of disaster waste and contaminated soil in Japan.

- **Abundant knowledge in waste treatment and recycling**

We have a track record of the proper processing and information management, and the formulation of medium to long-term processing plans and management strategies for many local governments and recycling companies and provide consulting services based on our abundant knowledge of waste processing and recycling.

- **Bringing together the knowledge, information and technologies of members**

We can provide comprehensive proposals bringing together the knowledge, information and technologies of various members from not just recycling companies but also manufacturing, IT and transportation companies etc. We also work closely together with the Kitakyushu Asia Low Carbon Center.



Shin Kitakyushu Kogyo Co., Ltd.



Towards the creation of sustainable industry that is friendly to people and the environment

Contact Address

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Telephone/Email
 +81-93-481-2893/
<http://shinkitakyukg.co.jp/contact.html>

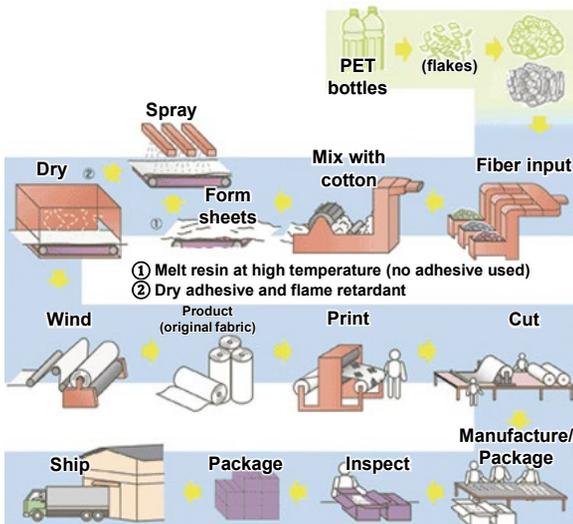
Our company manufactures non-woven fabric and injection molds using plastic as raw materials. For this purpose, we actively work on recycling and work towards the advanced manufacture of plastic products in harmony with the environment.
 (WATANABE Hisaya, Director)



WATANABE Hisaya, Director

Development and manufacture of recycled, non-woven fabric filters achieving a high compound ratio

▼ Non-woven fabric product manufacturing processes using recycled PET fiber



▼ Filter performance test equipment



▼ Examples of recycled PET non-woven fabric and biodegradable plastic products



Effectiveness

We develop and manufacture products using recycled PET (polyethylene terephthalate) fibers and choosing our products can contribute to **reduced waste emissions and the effective utilization of resources**. Also, by reducing dependence on petrochemical resources this leads to a **reduction of greenhouse gas emissions**.

In terms of product functions our range hood (ventilation fan) filters reduce labor for the cleaning of range hoods by preventing the adherence of oil, and our air conditioner filters can be expected to purify the air by collecting mites and house dust etc.

Applications

By installing our filters in household range hoods and ventilation fans, and office, store and factory air conditioners, it is possible to save labor in cleaning work and maintain a comfortable air environment.

Strengths

● **Technical capability to realize high rate of PET recycling**

We have cultivated technological capabilities for a high compound ratio with 30 years of development of products using recycled PET. Currently, we manufacture non-woven fabric products using PET fiber as a raw material such as our marquee product range hood filters, which achieve a 90% compound ratio of recycled PET.

● **Pursuit of safe and functional products**

We have in-house quality inspection equipment and carry out thorough quality control, conducting regular combustion and tensile tests and measuring pressure loss (air resistance). There is a good balance of filtration performance and aeration performance, with air passing through well and sound removal of oil and fine dust.

● **Certified recycled products that meet prefectural standards**

Our range hood and ventilation fan filters have been certified "Fukuoka Prefecture Certified Recycled Products" due to their high content of recycled resources. (as of March 2021)



Shinryo Corporation



Utilizing chemical technologies to take limited resources to the next generation!

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tanaka.shingo@me.shinryo-gr.com

Major Overseas Bases

Active in China (Suzhou), Taiwan

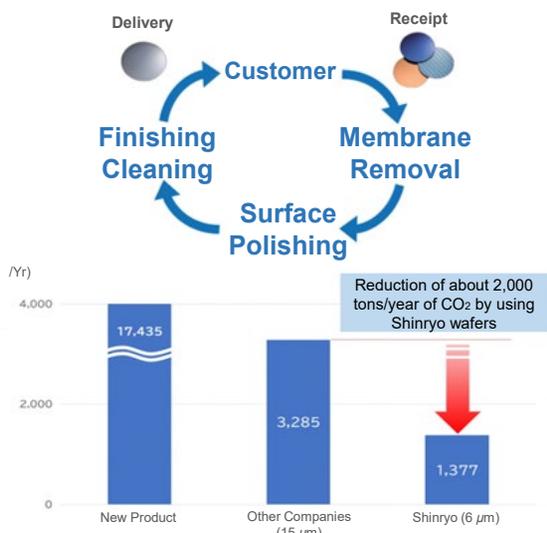
We are a company that looks to show good faith to our work, people and the earth. We make full use of chemical technologies through “reduce, reuse and recycle” and with the “reliance (trust)” of the community we contribute to the creation of a resource-recycling society. (TANAKA Shingo, New Business Development Office, Corporate Planning Headquarters)



TANAKA Shingo, New Business Development Office

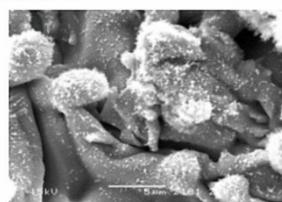
Processing solutions connected to cost reduction and the effective use of resources

- Increasing the number of reuses and effect of greenhouse gas emission reduction from recycling used monitors/dummy wafers

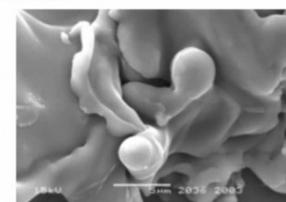


- Removal of fine particles from semiconductor manufacturing equipment by precision cleaning

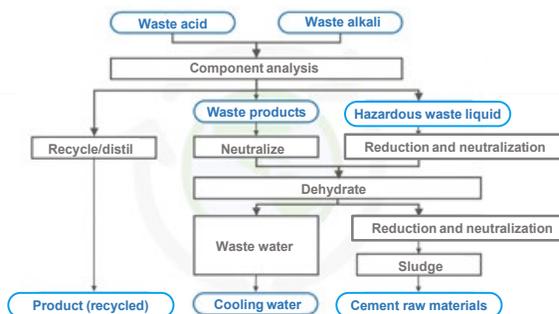
Before



After



- Example of waste recycling using processing technologies



Effectiveness

By polishing the surface of used semiconductor silicon wafers they can be reused many times, which can **reduce the cost of procurement** and can **reduce greenhouse gas emissions associated with manufacturing new products**. Also, since the precision cleaning of semiconductor manufacturing equipment contributes to reduced production loss due to dirt, this can contribute to **improved yield** and **reduced waste generation**.

By recycling the chemical products and waste discharged by raw material producers and manufacturers, our resource recycling business promotes the **reduction of waste disposal and effective use of resources**.

Applications

We provide the recycling of used wafers and precision cleaning of semiconductor manufacturing equipment for semiconductor manufacturers. In terms of resource recycling, we pick up waste from various raw material producers and manufacturers and provide recycled products.

Strengths

- Provision of recycled wafers with excellent cost and environmental functions**

We recycle monitors and dummy wafers used in the semiconductor manufacturing process utilizing our proprietary technologies for film removal, surface polishing and finishing cleaning. We conduct inspections with high-precision equipment and provide recycled wafers of reliable quality.

- Precision cleaning technologies for semiconductor manufacturing equipment**

Using our precision cleaning technology, we can remove μm to nm units of dirt from semiconductor manufacturing equipment. We can remove fine particles that are the source of dust and residual abrasions and alterations to the layers of ceramic/metal surfaces.

- Promotion of a resource-recycling society with advanced processing technologies**

Our recycled wafer business and precision cleaning technologies for semiconductor manufacturing equipment are backed by technologies and know-how in physical and chemical processing technologies cultivated through many years of chemical recycling and waste treatment. We have advanced technologies that can remanufacture used chemical products as new products and we make proposals which lead customers to the effective use of resource in production activities and the reduction of raw material procurement costs.



Daio Engineering Co., Ltd.



Working with sincerity and enthusiasm to realize an affluent life for the people of the world

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+81-92-475-7212/soumu@daio-eng.co.jp

Our company utilizes the know-how of our technicians and replaces what employees want to do with what customers want to do, aiming to be a company loved by everyone that can act and contribute to goals with wisdom and technology.
(MURACHI Masatoshi, Kyushu Sales Office)



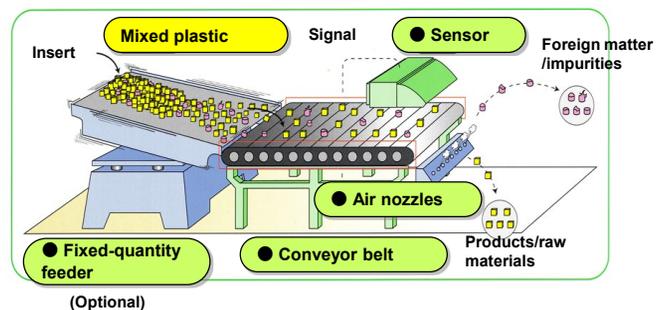
MURACHI Masatoshi,
Kyushu Sales Office

“Aero Sorter Series” contributing to recycling-oriented businesses

▼ Latest model “Aero Sorter V” capable of sorting black plastic

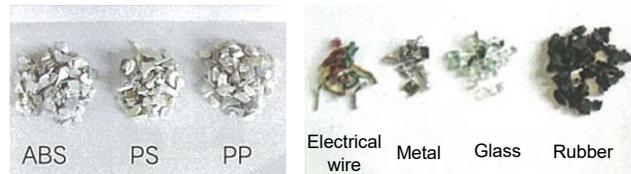


▼ High purity sorter “Aero Sorter Series” selection principle



▼ Examples of sorted and collected items

- Left: sorting of ABS/PS/PP from mixed plastics
- Right: Recovery of materials other than resin from car crush residue



Effectiveness

The “Aero Sorter Series” is a device that sorts materials targeted for recovery from other materials with air nozzles in the later stage after sensing objects on the conveyor belt. By adjusting the detection method and device specifications it is possible to collect metals such as copper and aluminum, soft/hard/flame-retardant plastic, paper and wood, rubber, and glass from used products etc. As a result, this contributes to the **reduction of landfill and effective use of resources.**

Applications

This product was developed for those developing waste treatment/recycling businesses for waste automobiles and waste electronic and electrical devices, plastic containers and packaging, and metals etc. We also build flexible systems that can meet the needs on site. Please choose us for the total coordination of your entire plant.

Strengths

● **“Aero sorter series” realizing high purity resource recovery**

The aero sorter series can recover high purity resources by assembling a device with sensors appropriate to the target object (waste automobiles, waster electronic and electrical devices and plastic containers and packaging etc.). In addition to color, shape and near infrared sensors, we have developed a sensor that recognizes black plastic and have improved sorting accuracy by installing AI and can make proposals tailored to your needs.

● **Proposals for the entire processing system**

In addition to aero sorters, we develop and manufacture a series of devices (crushers, sieves, wind sorters etc.) in-house from the acceptance of objects to the recovery of resources. We make proposals to optimize the entire processing system.

● **Total coordination of the entire plant**

We not only introduce devices but can also provide full support for environmentally friendly recycling plants, from design and construction to maintenance and the handling of recovered resources (RPF etc.).



Waste

Total Care System Co.



Aiming to contribute to the SDGs through the recycling of disposable diapers!

Contact Address

1-10-40 Isoda, Hakata-ku, Fukuoka

Telephone/Email

+81-92-588-3365/info@totalcare-system.co.jp

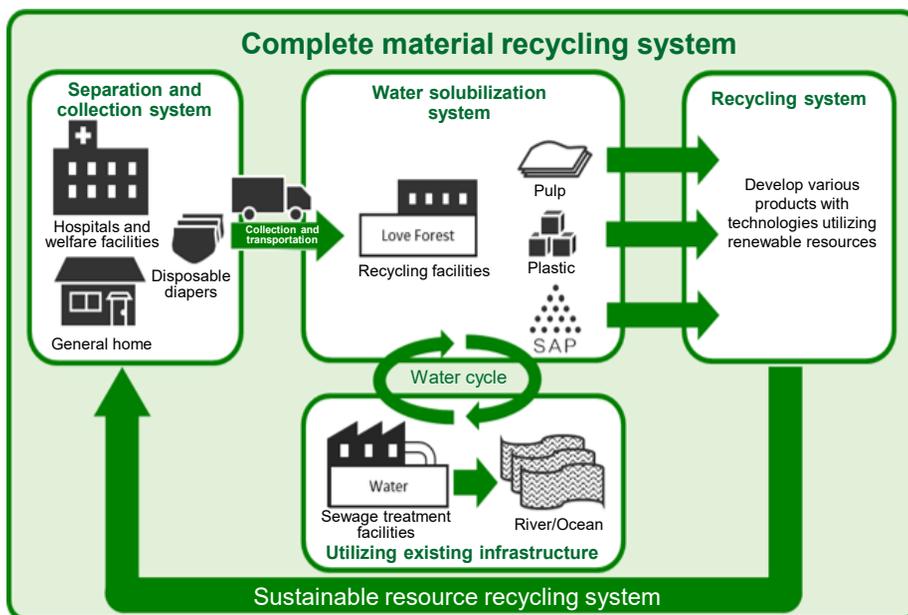
We have positioned used disposable diapers as a resource. We aim to create a society where recycling is the norm, instead of incineration. We are working towards the realization of cities that are friendly to the global environment through collaborations with nation and local governments, local residents and various businesses.
(CHO Takeshi, Representative Director)



CHO Takeshi,
Representative Director

Eco-friendly recycling system of disposable diaper

▼ Complete material recycling system



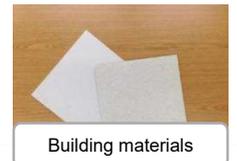
▼ Factory exterior (LOVE FOREST Omuta)



▼ Goods collected in the recycling system



Recycled pulp



Building materials



Plastic raw materials (pellets)



Soil conditioner

Effectiveness

By recycling used disposable diapers issued from medical, welfare and nursing care sites instead of incinerating them, we can **promote the effective use of resources**.

Our company is building a functioning system which unifies “separation and collection,” “water solubilization treatment,” and “recycling” **to reduce greenhouse gas emissions** from fossil fuels and greatly contribute to **the reduction of environmental load**. Disposable diapers have a high water content and low combustion efficiency, so there are also merits in reducing the load on incinerators.

A separation and collection is essential for building a recycling system, and we hope to work in cooperation with local governments **to contribute to the sustainable development of the region**.

Applications

We offer a consulting business for each stage of construction of a recycling system, from manufacturing to sales, emissions, and recycling. We are also looking to expand our business overseas, and have a business alliance with a major Taiwanese sanitary material manufacturer.

Strengths

● **Separation and collection in cooperation with medical welfare facilities and local governments**

We have built a cooperative system with medical and welfare facilities to reduce the amount of mixed foreign matter which is a barrier to recycling, and we are also working on the separation and collection of used disposable diapers in cooperation with local governments in Fukuoka Prefecture (Oki, Miyama).

● **Technology to replace incineration with “water solubilization treatment”**

Currently, most disposable diapers are incinerated, but our company became the first to commercialize water solubilization in Japan in 2005. Using water and a separating agent, used disposable diapers are separated into pulp, plastic, sludge and other materials reducing CO₂ emissions by about 40% compared to incineration. We have realized a cost-effective methods of recycling in utilizing existing infrastructure (cooperation on sewage treatment plant water resources etc.)

● **Recovery of useful resources utilizing a recycling system**

The recycled pulp recovered by solubilization is used as a building material, the sludge is used as soil conditioner and the plastic is recycled as solid fuel (RPF), but we are currently moving ahead with research and development with the goal of returning useful products to the emitting companies (upcycling).



NARITABISO Co., Ltd.



Working towards the creation of a recycling-oriented society based on numerous achievements!

Contact Address

1-8-17 Seiho, Kurume, Fukuoka

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+81-942-44-1030/

http://www.naritabisou.com/contact/form.php

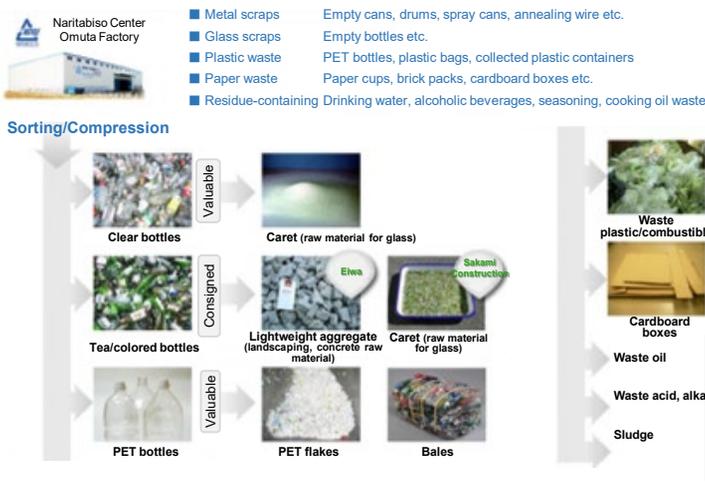
Our company will soon be celebrating 50 years since its founding and we are focused on recycling towards the future of SDGs. We focus on the promotion of sorting before and after acceptance and specialize in the processing acceptance of difficult-to-process items. (YOSHITOMI Shinichi, Representative Director)



YOSHITOMI Shinichi, Representative Director

Treatment and recycling of a wide variety of waste

▼ Omuta Factory recycling flow



▼ Exterior/Interior of Omuta factory



Effectiveness

The proper treatment of waste discharged by homes, businesses and medical facilities **contributes to extending the life of landfills and conserving living environments**. Medical waste in particular can contain pathogens which may infect people and it is very important to properly process it.

Also, by recycling metals, plastics and glass from collected waste it is possible to make **effective use of resources**. The Omuta factory processes 72 tons a day and has **achieved a recycling rate of 95%**. We aim to make effective use of resources as much as possible, in the spirit of "Mottainai."

Applications

We can provide various know-how on waste treatment and recycling.

Strengths

● **Wide variety of waste treatment and recycling results**

We have been accepting general waste, industrial waste and medical waste for many years and have cultivated technologies and expertise in the processing of various waster such as containers and packaging, scrap metal, glass scraps, waste plastic and waste paper etc. We also hold ISO14001 certification and conduct our business with consideration for the environment.

● **Technology for processing fiber waste and residue-containing containers**

For fiber waste that is not easy to dispose of, we have improved crushers and technologies for collecting coal substitute fuels and foaming cushioning materials for cement and paper companies, depending on the application. In addition, while residue-containing containers are generally incinerated we have developed a technology to separate the contents and containers and we supply materials including PET as material resources.

● **Waste collection know-how based on applications**

We also handle collection and transportation vehicles and container, as well as special containers for medical waste, depending on the application. We work in cooperation with other waste treatment and recycling companies for efficient container and packing recycling over a wide area.



JEPLAN, Inc.



Aiming for a society in which everything is recycled

Contact Address

Head Office: 12-2 Ogimachi, Kawasaki-ku, Kawasaki, Kanagawa
 Kitakyushu Plant: 1-120-6 Hibikimachi, Wakamatsu-ku, Kitakyushu

Telephone/Email

info@jeplan.co.jp

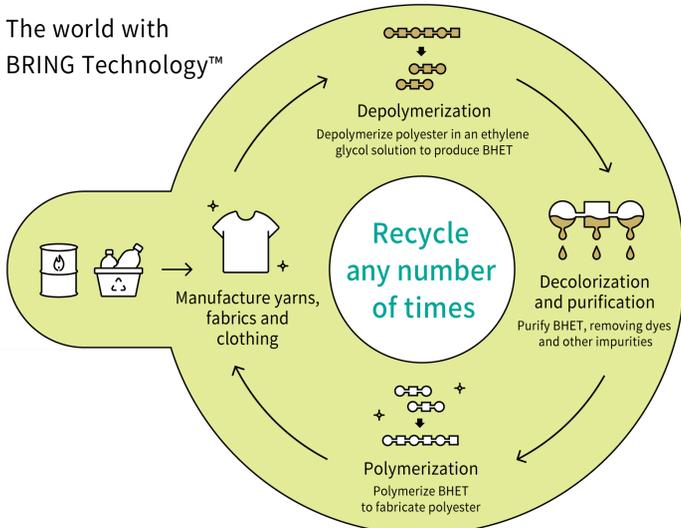
Our business moves forward with a focus on fiber recycling, under the vision of “recycling everything.” We operate a commercial recycled polyester manufacturing factory in Kitakyushu, with chemical recycling technology said to be one of the most advanced in the world.
 (TAKAO Masaki, CEO)



TAKAO Masaki, CEO

“BRING Technology™” proprietary chemical recycling technology realizing PET to PET

▼ Horizontal recycling realized with BRING Technology™



▼ Clothing recycling project “BRING™”



“Making clothing from clothing”

Effectiveness

“BRING Technology™” is a unique chemical recycling technology for PET (polyethylene terephthalate).

Horizontal recycling from clothing to clothing and from PET bottle to PET bottle is possible, and it is also possible to manufacture recycled resin of the same quality as new PET resin made from petroleum.

By making use of **PET that had previously been incinerated or landfilled as a substitute for natural resources**, it is possible to contribute to the **reduction of the amount of landfilled waste, improved resource efficiency, and the control of CO₂ emissions etc.**

Applications

So far, more than 150 brands have participated in the “BRING™” clothing recycling project. We are also expecting to expand our technology licensing business for existing resin manufacturing factories.

Strengths

● **Patent technology enabling horizontal recycling**

BRING Technology™ extracts monomer (BHET: Bis-2-hydroxyethyl terephthalate) through the combination of different purification processes called “crystallization” and “distillation.” Also, depending on the condition of the items to be recycled and the applications after recycling, by changing the combination and order of the refining processes, properly removes impurities from the items to be recycled. In this way a recycled resin of equivalent quality to new PET resin can be manufactured.

● **Can be connected to existing resin manufacturing processes**

The BHET extracted in the purification process is a commonly used substance as raw materials with existing PET polymerization equipment. Thus, it is possible to connect equipment utilizing BRING Technology™ with the existing resin manufacturing process.

● **Consistent approach from collection to manufacturing**

In cooperation with various partners such as in the apparel industry, we are promoting the horizontal recycling of plastics and clothing through the collection of PET products and manufacturing products with “collected goods recycled into raw materials.”



Nippon Magnetic Dressing Co., Ltd.



Practicing a sustainable growth in the “recycling industry”

Contact Address

3-6-42 Bashaku, Kokurakita-ku, Kitakyushu

Telephone/Email

+81-93-521-4400/ nmd_info@nmd.co.jp

Major Overseas Bases

Hankook Matics Co., Ltd. (Korea)

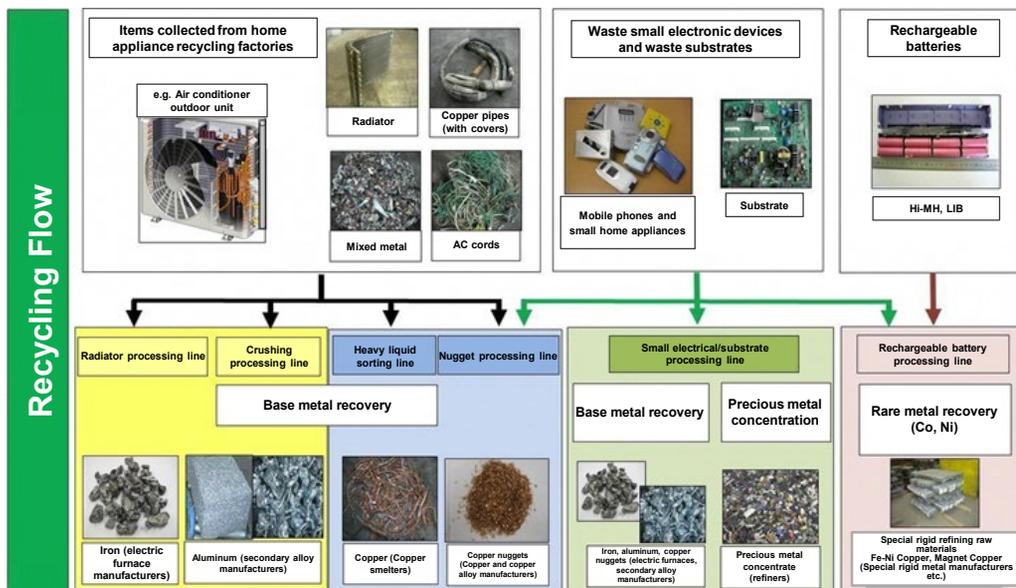
Since our founding in 1949, Nippon Magnetic Dressing Co., Ltd. has developed business activities mainly in the recycling of steel by-products (slag) generated from steelworks. Recent business developments have included the development of rechargeable battery recycling technology in the field of environmental and non-ferrous recycling, and we have worked on the recycling of rechargeable batteries equivalent to industrial waste and general waste, with a focus on small home appliances, contributing to domestic resource circulation and the reduction of final disposal volumes.
(SEKIOKA Shingo, Executive Officer, Corporate Planning Department Manager)



SEKIOKA Shingo, Executive Officer, Corporate Planning Department Manager (left), IDETA Yukinobu, Corporate Planning Department Section Chief (right)

Technological cooperation on E-waste including for rechargeable batteries

▼ Example of an E-waste recycling flow



▼ Small electronic equipment processing facility



▼ Rechargeable battery processing facility



Effectiveness

Utilizing our technology and know-how for the dismantling, crushing and sorting of resources collected from waste electrical and electronic equipment, we promote the proper treatment of waste and the recovery of various valuable metals such as iron and non-ferrous metals, contributing to the **control of environmental pollution in waste treatment, reduction of disposal landfill and improvement of resource efficiency.**

We also have the technology and know-how to recycle rechargeable batteries with the expected increase of emissions due to the spread of smartphones etc. This can contribute to **the recovery of resources such as rare metals which have previously been difficult to collect, preventing the outflow of harmful substances and ignition etc.**

Applications

We provide technical cooperation on the processing and recycling of waste electrical and electronic equipment. We also consult with government officials who are considering building various recycling systems.

Strengths

● **Metal recovery using various crushing and sorting technologies**

We have our own recycling factory for waste electrical and electronic equipment in Fukuoka and have a track record for proper processing and recycling. We build unique processing processes utilizing various sorters such as magnetic sorters, eddy current sorters, dry specific gravity sorters and heavy liquid sorters. The processes makes it possible to collect various valuable metals.

● **Proper processing/recycling technology for rechargeable batteries**

Our company is registered as a certified business operator under Act on Promotion of Recycling of Small Waste Electrical and Electronic Equipment and have developed a recycling technology for rechargeable batteries. Using a superheated steam pyrolysis furnace, it is possible to properly dispose of rechargeable batteries, collecting various valuable metals such as rare metals and special steel.

● **Achievements in overseas technical cooperation**

We provide technical cooperation for overseas businesses utilizing our track record of the proper processing and recycling of waste electrical and electronic equipment in Japan. We have provided cooperation in the form of guidance for the dismantling of waste electrical and electronic equipment for dismantlers in Cebu, Philippines.



Beetle Engineering Co., Ltd.



Affiliate (Nishihara Shoji) website

Making proposals overseas for the optimization of infectious waste treatment!

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 2-8-2 Jinnoharu Yahatanishi-ku, Kitakyushu
Telephone/Email
 +81-93-644-0158/s-narita@beetle-ems.com
Major Overseas Bases
 Active in Indonesia

We have optimized price, environmental considerations, human resource development and operations management support to eliminate the anxiety concerned with the introduction of incinerators. We also propose sustainable systems for domestic and overseas users that don't require large equipment.
 (NARITA Shiho, International Development Office)



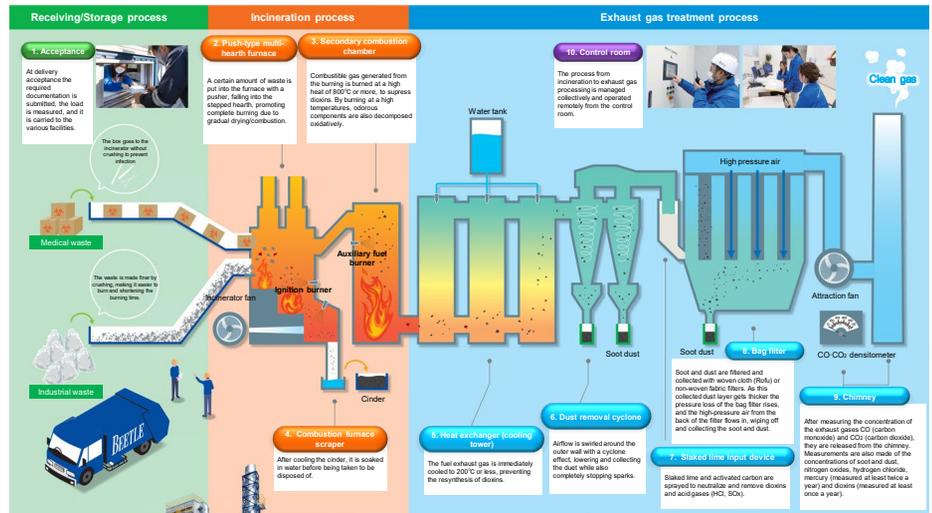
NARITA Shiho, International Development Office

Small incinerators providing the improvements of softwares and hardwares

▼ Push-type multi-stage incinerator



▼ Processing Flow



Effectiveness

Our “BE series” push-type multi-stage incinerator is a small incinerator for the stable combustion of various waste including medical, municipal and industrial waste. Through the thorough review of device specifications in joint research with engineers, we have realized **high efficiency, small-scale processing at a price range that is easy to implement**. We have a fully environmentally friendly structure from combustion to exhaust gas treatment processes, meeting domestic and international standards. We also promote the **proper treatment of medical waste** and contribute to **resolving the issue of insufficient landfill sites by reducing the volume and weight of waste**.

Applications

This facility can be introduced at processing companies, government agencies (local governments etc.) and medical institutions aiming to dispose of 15 to 50 tons of waste per day.

Strengths

● Environmentally friendly and low cost

Thorough environmental consideration is given to not only suppress the generation of harmful substances such as dioxins with stable combustion at about 900 degrees, but also the emission of exhaust gas contact water using indirect cooling methods, etc. At the same time, our pursuit of practicality with designs that do not require large-scale wastewater treatment equipment allows introduction at a low price and in a small area because of the simplicity of the equipment.

● Human resource training center

A major concern when introducing equipment is the reduction of anxiety in human resource development, and at our company's factory in Fukuoka prefecture we accept operational training from Japan and overseas using actual machinery. We support smooth introduction through such opportunities to handle the equipment in advance.

● Cooperation with a traceability system

By using it with our company's “bee-net system” centralized waste management system, we can build a more reliable and appropriate processing flow. We also support soft management measures in waste treatment, including medical waste with dangerous and harmful properties.



Hitachi Zosen Corporation



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

Contact Address

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Kyushu Branch : 3-2-1 Hakataekimae, Hakata-ku, Fukuoka

Telephone/Email

+81-3-6404-0841/aono@hitachizosen.co.jp

Major Overseas Bases

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

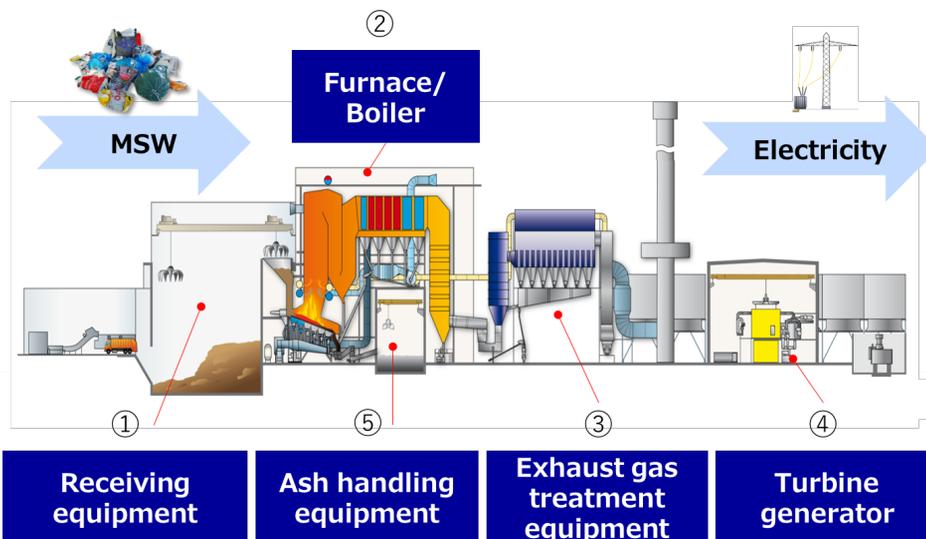
We continue to provide value with advanced technology and sincerity in response to environmental problems, based on our corporate philosophy of “we create value that is useful to society with our technology and sincerity, contributing to a prosperous future.” We do our best as a solutions partner to 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

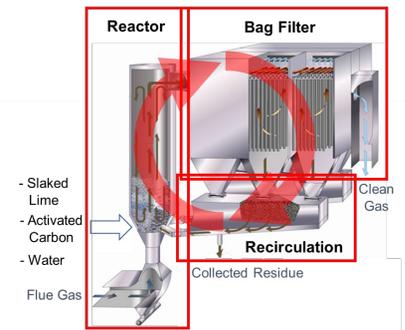
▼ Waste-to-Energy facility schematic diagram



▼ “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.



Fukuoka Metal Enterprise Co., Ltd.



Stable supply of high-quality iron scraps from a raw material manufacturer of steel to Japan and Asia

Contact Address
885-19 Nakaizumi, Nogata, Fukuoka
Telephone/Email
+81-949-25-1800/fukkin@fukkin.co.jp

For more than 70 years since our founding, we have worked for the stable management of metal scrap/waste collection and processing. We are expanding our business in every aspect based around our weapons of "quality" and "speed." In recent years we have also developed Kyushu's first automatic resource recovery system "eco Pit 24" (<http://www.fkeco.jp/>). (YOKOMIZO Junya, President)



Production and sales of high-quality iron scraps (raw material for steelmaking) through the establishment of quality control systems (collection, processing and sorting)

- ▼ Left: ISO14001 (Environmental Management) certification
- Right: ISO45001 (Occupational Safety and Health Management System) certification

- ▼ 400-horsepower vertical shredder



Effectiveness

Our company has abundant technology and know-how in the management and treatment of high-quality iron scrap (raw material for steelmaking). By performing the appropriate processing for each type of input, the impurities mixed in the scrap can be managed. In addition to contributing to the improvement of the environment, we aim to **improve resource efficiency** by **recycling as higher value-added raw materials**.

We also use our own quay for the export of iron scrap, realizing the **supply of high-quality recycled raw materials to Asian countries** and the **expansion of international resource circulation**.

Applications

Proper treatment of metal scrap and waste resulting from production at manufacturing plants. We also sell steelmaking raw materials to businesses looking to purchase raw materials.

Strengths

● **Optimal processing utilizing processing technologies and know-how**

We have a 1,250 t scrap shear (2 units), 400-horsepower vertical shredder, and a press machine, and have the technology and know-how for the compression cutting, crushing and compression processing of metal scrap etc. Utilizing these technologies and know-how, it is possible to perform optimal processing depending on the type of metal scrap and to produce higher quality iron (raw material for steelmaking).

● **Proper management of procured metal scrap**

By managing procured metal scrap depending on types and suppliers, it is possible to perform optimal processing for each. We are also working hard on human resource education to improve awareness of safety and quality.

● **Abundant track record of overseas transactions**

We have an abundant record of transactions (export of iron scrap etc.) with Asian countries (China, Thailand, Philippines, Vietnam, Malaysia etc.) from Kyushu's first proprietary import/export quay in Hibikinada district of Kitakyushu. In addition, we have exchanged information with local stakeholders in Malaysia.



Fukuoka Bioindustry Development Research Institute



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

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 +81-942-78-6135/houzou@fukuseiken.co.jp

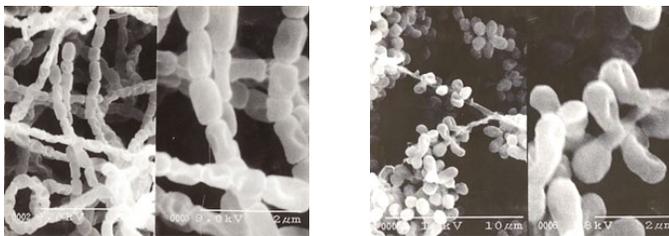
We effectively return to the soil organic matter nutrients that have been robbed from soil, reducing the use of pesticides and fertilizers as much as possible, and regaining the original nutrition and strength of crops, thinking first about “protecting food, human health and the environment for the future.”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

Degradation of Escherichia coli O-157

Escherichia coli O-157 → 5 days after actinomycete treatment

The E. coli is adsorbed and decomposed by the actinomycete hyphae!

Decomposition of flies and insects

Fly egg → 5 days after actinomycete treatment

The eggshell is decomposed by the power of actinomycetes!

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 composting and economy of our in-house developed compost manufacturing equipment are attractive.



FROM Industry Co., Ltd.



Using expertise and technologies to develop products to meet the needs of society

Contact Address
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 +81-93-244-2061/frominfo@joy.ocn.ne.jp

It has been about 50 years since the manufacture of disposers began in Japan. By repeatedly improving this product in-house and inheriting its technical history, we propose new kitchen life and contribute to environmental protection and energy saving/creation.
 (OBATA Ukiyo, CEO)



A high performance and safe disposer utilizing a large number of patented technologies

▼ Disposer (large capacity type)



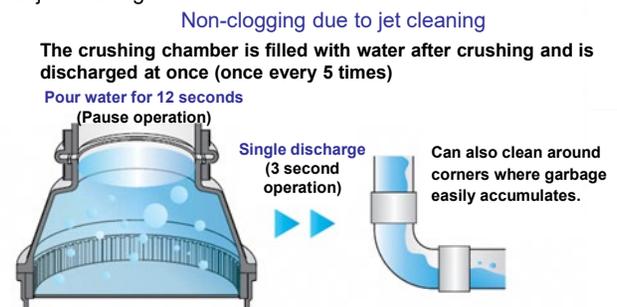
▼ Hammer and fixed blade structure



The FROM disposer can handle it!



▼ Illustration of jet cleaning



Effectiveness

Food waste can be crushed into small pieces with our disposer, and the solid and liquid can be easily separated with a dehydrator. As a result, the weight and volume of garbage can be reduced. This efficient transport of kitchen waste can contribute to **energy saving and cost reduction, the reduction of incineration volume, and the improvement of combustion efficiency by reducing the water content of kitchen waste.**

In addition, used together with biogas power generation equipment waste can be used to generate power, contributing to **the emission control of CO₂ from fossil fuels and the sustainable use of resources.**

Applications

It can be used in homes and apartments, and commercial disposers can be used in school lunch centers, hospitals, schools and restaurants etc.

Strengths

● **High crushing power and safety**

By utilizing saw-shaped fixed blades and a hammer that increases centrifugal force, the unit has a high crushing power and can crush kitchen waste that is difficult to dispose of such as edamame pods and onion skins etc. In addition, given that our company's product is a batch type operation (lid switch operation) there is no risk of accidentally touching it and it is very safe.

● **Excellent drainage with jet cleaning**

It has a function which jet cleans on a regular basis by filling the crushing chamber with water and discharging it in one go after the crushing of kitchen waste. This makes maintenance easy and prevents the clogging of pipes with garbage after crushing.

● **Efficient operation based on the amount of kitchen waste**

The unit has a program that processes kitchen waste depending on the amount of kitchen waste thrown in. It enables efficient operation depending on the amount of kitchen waste and contributing to energy saving and cost reduction.



E.I.M. Control Systems Co., Ltd.



Providing comprehensively customized services

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Our company has been working on water treatment technologies since its founding. We are also working on environmental conservation and energy saving technologies with our involvement in plant equipment such as steelworks and harbor crane control etc. In process control we support a wide range of electrical controls incorporating remote technologies such as communications and remote monitoring etc. We are researching every day based on the concept of "delivering highly reliable control systems that satisfy customer needs."
(KURAMOTO Arata, President and CEO)



KURAMOTO Arata, President and CEO

Contributing to water treatment and energy saving by an excellent system control



▲ Introduction of control system at a water treatment facility



▲ Many achievements in harbor crane equipment



Effectiveness

Our company specializes in system control devices and has **contributed to the management of river and ocean river quality** by working with water treatment equipment manufacturers to introduce management systems for water and sewage facilities, rainwater treatment facilities and dams and rivers.

Aside from water treatment equipment, we can also achieve **energy savings** with highly efficient controls of systems that use motors.

Applications

We provide control systems for the construction of **water and sewage facilities and various hydraulic facilities (river gate equipment, manhole pumps)** by municipalities. The control of **water treatment facilities for electric power plants and steel works** is also possible.

We have many achievements in the control of cranes in harbor areas.

Strengths

● **Custom made to meet your needs**

Because our products and systems are custom made, we are able to introduce control systems that are suitable for the actual usage environment. Some electrical manufacturers offer general-purpose control systems, but at EIM Control Systems we consider control systems unique to each setting. We also provide a comprehensive service, from design to after-sales support.

We can respond strongly to the need to "improve energy saving effectiveness." Our strength is the ability to introduce control systems that respond to local needs and legal requirements.

● **Compatible with various electrical systems**

In addition to water treatment equipment, we also manufacture control systems for harbor cranes, steelworks work machinery and operating systems, and power plant coal transport equipment etc.

We provide highly efficient control systems with advanced technology while collecting information on the latest equipment and products.



ISHIGAKI COMPANY, LTD.

Maintaining water infrastructures with “trusted technology”!

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Major Overseas Bases

Ishigaki Environmental Machine (Suzhou) Co., Ltd.
(China)
+86-512-6283-2377

Ishigaki develops, designs and manufactures unique dehydrators and pumps etc. These products are used in many fields in Japan and overseas such as in water and sewage facilities and production processes and we demonstrate technologies from the maintenance of familiar household water to the conservation of water environments. (MURAKAMI Hiroaki, Chief, Business Promotions Headquarters, Environmental Machinery Division)



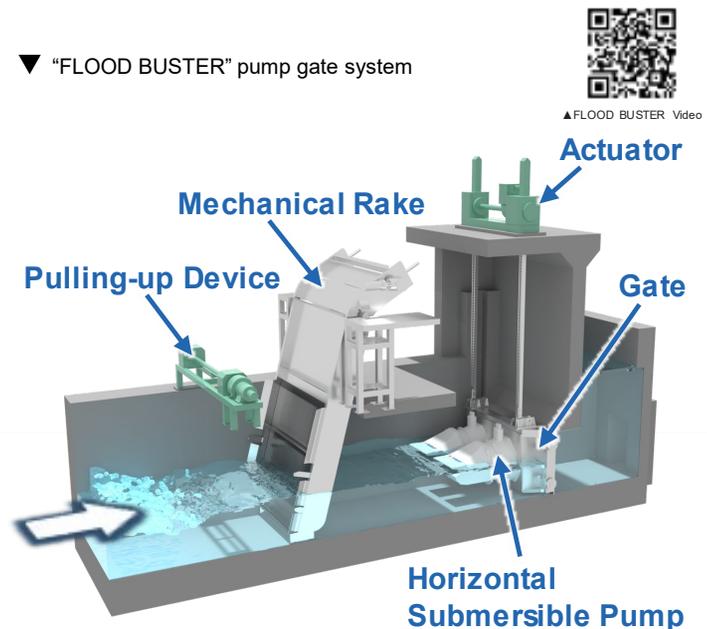
KURITA Mamoru (left),
ICHIHARA Shinji (center),
MURAKAMI Hiroaki (right)

Highly efficient solid-liquid separation by filter cloth-type “LASTA PRESS” and flood control system “FLOOD BUSTER” with minimal footprint

▼ Appearance of “LASTA PRESS”



▼ “FLOOD BUSTER” pump gate system



Effectiveness

The filter cloth-type “LASTA PRESS” is used in various fields, such as for separating the solids and liquids from sludge in water and sewage treatment plants and private factories. Its excellent dehydration performance and high processing capacity lead to **reduced processing costs** and **energy savings**. Also, by collecting the matter suspended in wastewater, it contributes to the **conservation of water environments** when discharged into lakes and rivers.

The “FLOOD BUSTER” pump gate system allows for the construction of compact and effective pumping stations in a short period of time. This is useful for city **flood control** and to **protect people’s lives**.

Applications

The filter cloth-type “LASTA PRESS” is used to separate solids and liquids in the wastewater and manufacturing processes at water and sewage treatment plants and various private factories (food, chemicals, steel, papermaking/pulp, etc.). “FLOOD BUSTER” forcibly drains rainwater from areas to protect them from flooding.

Strengths

- **Self-driving filter cloth-type “LASTA PRESS” with high dehydration performance and high processing efficiency**

A filter press that operates fully automatically, equipped with a number of original mechanisms such as a top feed liquid supply, an original filter cloth independent running mechanism, and the simultaneous opening and closing of filter plates etc. The simple structure makes maintenance easy.

The ability to peel the cake (dehydrated solid) and wash the filter cloth at the same time in all rooms eliminates time and effort and also produces very high processing efficiency, which make this attractive in comparison with conventional machines that open the plate sequentially.

- **“FLOOD BUSTER” pump gate system achieving effective pumping stations**

Because it is installed directly in existing waterways, it can be constructed with a minimal amount of land. This also realizes low-cost pumping stations quicker in comparison with regular pumping stations. “FLOOD BUSTER” can pump at full speed in full water levels, and its simple configuration reduces the risk of failure due to repeated stopping and starting.



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



Ishikawa Engineering



Mitsubishi Chemical Aqua Solutions

Providing reliable services based on abundant achievements!

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Mitsubishi Chemical Aqua Solutions Co., Ltd.
Contact Address: 2-2-28 Gintennmachi, Hakata-ku, Fukuoka
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Major Overseas Bases: Active in Philippines, Myanmar

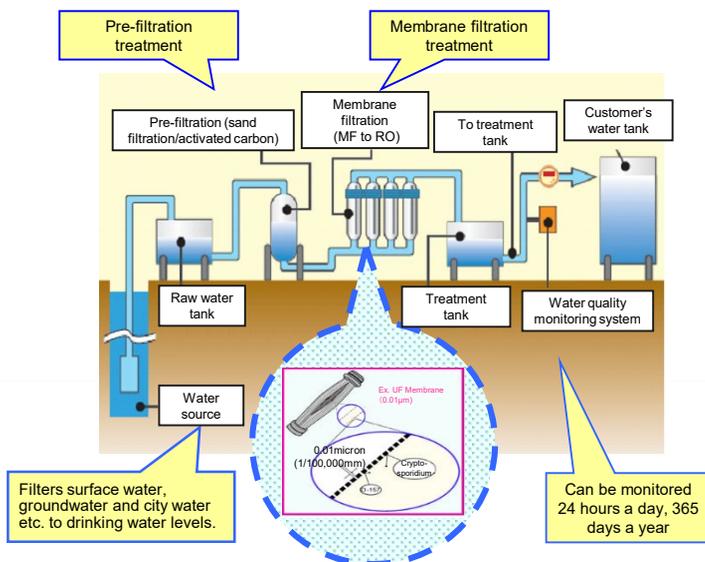
We are expanding the safe, secure and inexpensive supply of water overseas, mainly in Indonesia, with the cooperation of Kitakyushu City Hall. We will continue to provide "safe water," one of the goals of the SDGs. (NAKASHIIMA Hideshi, President and CEO of Ishikawa Engineering Co., Ltd.)
Water is indispensable 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 CO₂ 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.



SKE Co., Ltd.



Dedicated to water all the time, and providing services our valuable customers

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From the establishment of our company until today we have worked on the area of consistent fluid transfer and processing. We will continue to provide water environments that satisfy our customers, as we work to improve water related environments through the advanced treatment of wastewater and the recycling of treated water etc. as increasingly sought around the world in the future. (TAGAWA Seiji, Representative Director)



TAGAWA Seiji, Representative Director

Proposing plans according to your needs from water intake to supply and drainage



Apartment water purification system



Detached home water purification system

- ▲ A water purifier installed in general households. Supplies safe water through membrane filtration.



- ▲ Planning optimal water treatment tailored to the customer's needs, utilizing a variety of equipment owned by the company

Effectiveness

We provide services including the installation of water purifiers in general households, water conveyancing from water intake to final discharge for construction work, and wastewater treatment at construction sites and factories **providing planning and equipment** according to requests from our customers.

In areas where tap water quality is insufficient, we can supply **safe and high-quality water** using advanced processing such as membrane filtration and activated carbon etc.

Also, utilizing our abundant knowledge of heavy metal pollution cultivated through business with the public sector and at construction sites, we are able to **properly treat wastewater** from industrial activities and construction.

Applications

We have a strong track record in wastewater treatment at factories and construction sites. We also provide services for water distribution for companies and private homes, for the safe supply of domestic water.

Strengths

● Provision of rental equipment

We conduct planning from design to maintenance to meet the needs of the site through efficient water supply and drainage, wastewater treatment and water purification.

We also provide services to lend equipment owned by our company. Since there is no big initial investment, this can be effective for low-cost short-term use as temporary equipment for construction or when processing for a limited time for disaster recovery work etc. Also, since it uses ready-made equipment rather than made to order, it is possible to respond quickly to urgent water pollution.

● Compatible with various levels of water quality

We have many achievements and technologies that can deal with diverse living environments as well as more severe environmental problems. Our strength is our ability to propose optimal plans for safe and secure life and environmental maintenance associated with construction infrastructure.



Kamata Bio-Engineering Co., Ltd.



Providing economical systems conserving the environment and ecosystems

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 +81-92-471-1600/info@kamata-bio.co.jp

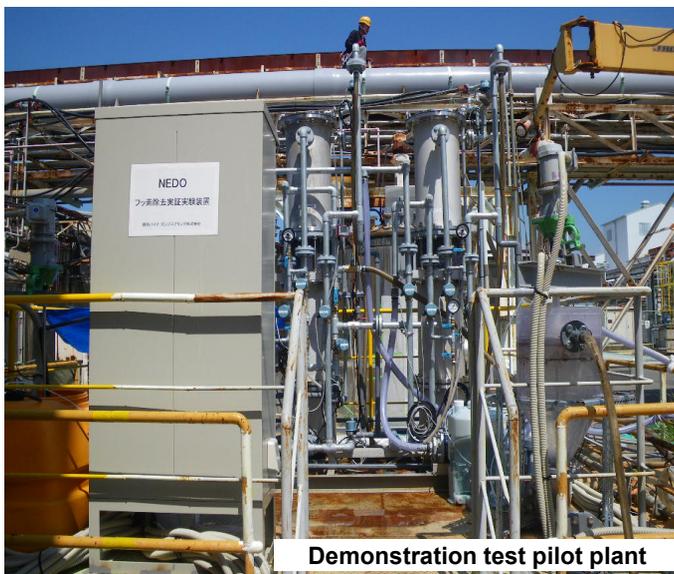
Magnetic agglutination biofiltration systems are gaining attention as devices that can purify contaminated water in a variety of fields. We have a track record of delivering systems in the private and public sectors as devices for the reuse of large amusement park lake water, car wash drainage and sewage.
 (KAMATA Hirofumi, Representative Director)



KAMATA Hirofumi,
 Representative Director

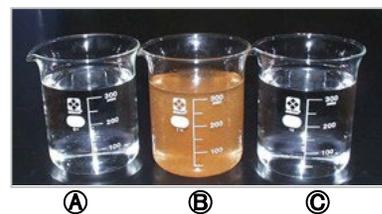
Achieving advanced water purification with proprietary adsorption and filtration technologies!

▼ Appearance of KBE Fluorine Removal System



Demonstration test pilot plant

▼ Effect of KBE iron/manganese/arsenic removal system



- (a) Tap water
- (b) Raw water
- (c) Treated well water

▼ Appearance of KBE oil decontamination system



Effectiveness

Our fluorine removal system not only **removes fluorine with high efficiency** but can also **reduce the amount of sludge generated** due to its high adsorption efficiency. In addition, the high filtration line speed contributes to the **compactness of the device, reduced initial and running costs, and reduced energy consumption**.

Because our iron, manganese and arsenic removal system can remove iron, manganese and arsenic ions by air oxidation only, without the use of oxidants, **safe drinking water** can be obtained from well water **without the production of by-products**. This can also contribute to the **reduction of chemical purchase costs**.

Our oil decontamination system **can process emulsified oil** which is difficult to process. We can also **miniaturize equipment** due to its high adsorption and aggregation performance.

Applications

We can handle the removal of fluorine from semiconductor/glass factory wastewater, the removal of iron, manganese and arsenic from well water, and measures against oil pollution for factories and refineries, depots and ships.

Strengths

● **High-speed fluorine coagulation and adsorption filtration system**

By injecting the fluorine adsorbent developed by the NEDO project* with a magnetic flocculant and combining a special fiber adsorption filtration tower, the environmental pollutant of fluorine can be removed at high efficiency in a short amount of time.

*New Energy and Industrial Technology Development Organization

● **Iron, manganese and arsenic oxidation catalyst filtration**

Using our special filter medium, we have achieved the reliable removal of iron, manganese and arsenic ions by air oxidation alone, without the use of oxidizers such as sodium hypochlorite or ozone etc. Our special filter medium meets US environmental standards and has a track record of about 60 years of use, so it can be used with confidence.

● **Economical and ecological oil pollution removal**

Our company's oil and fat water treatment agent shows good adsorption and aggregation performance for both floating oil and emulsified oil. In addition, we can detoxify the adsorbed and aggregated oil and fat components by microorganism decomposition. Also, by combining with a filtration system that allows backwash, a highly economic system can be built in comparison with other membrane treatments.



Kankyo Electronics Co., Ltd.



Creating a safe and secure society with reliable products

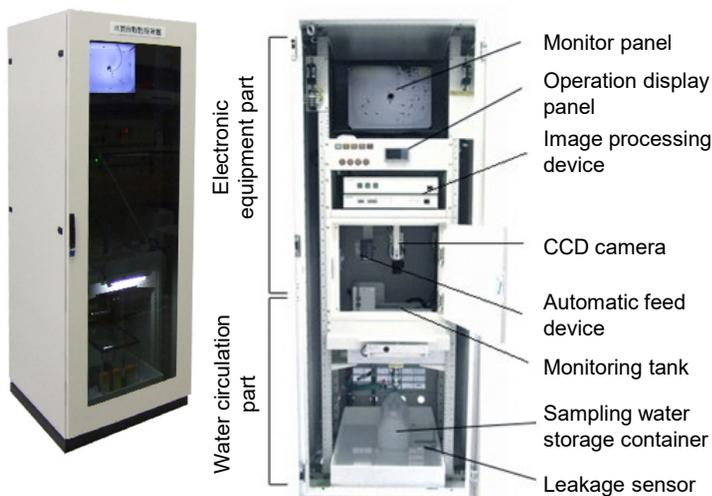
Contact Address
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We provide solutions with our equipment to waterworks bureaus around Japan to ensure safe “water” important for daily life. We have a record of being No. 1 in Japan for delivering water safety monitoring equipment. Our technology helps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

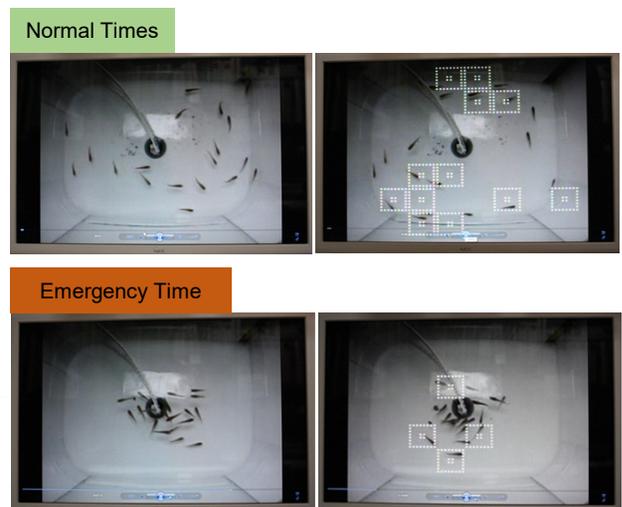


TAKAI Mizuki (left), YAMAMOTO Junichi (center), TAKAGI Yusuke (right)

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.



Kyowakiden Industry Co., Ltd.



Providing “One-stop” problem solving!

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 Fukuoka Branch : 7F Nishitetsu Hakata Ekimae Bldg. 1-6-16
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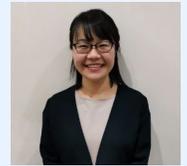
Telephone/Email

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Major Overseas Bases

KYOWA Environmental Technology (Shenzhen) Co., Ltd. (China)
 KYOWAKIDEN VIETNAM CO., LTD. (Vietnam)

Our company has accumulated technologies in the fields of water and electrical energy as an “environmental development company” and continue contributing to the achievement of the SDGs by providing services focused on the development of water and social infrastructure. (MATSUZONO Rieko, Representative)

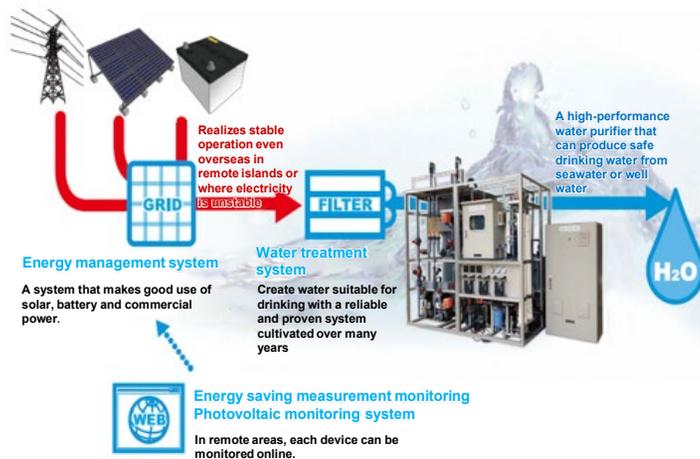


MATSUZONO Rieko, Representative

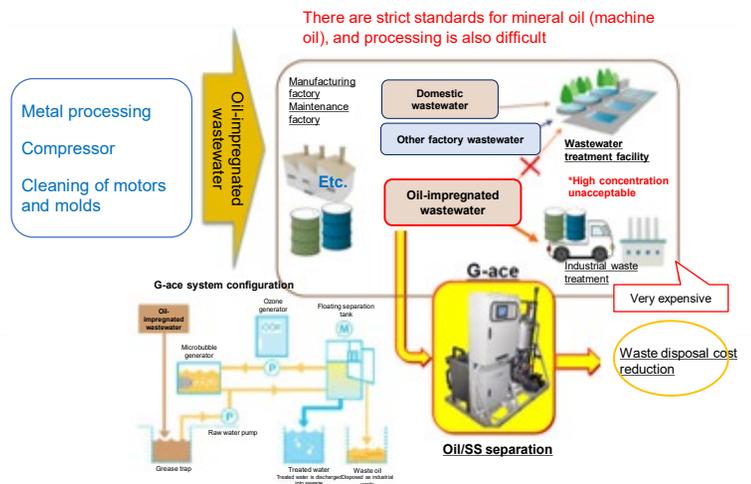
Meeting a wide range of water treatment needs, from drinking water to wastewater treatment!

▼ Hybrid water purifier

An advanced **water purification** system meeting water needs in regions with unstable power supply



▼ Oil-impregnated wastewater treatment device “G-ace”



Effectiveness

The introduction of a “hybrid water purifier” enables **stable supply of safe drinking water** even in areas where power supply is unstable. It **saves energy** because of its efficient energy management.

The oil-impregnated wastewater treatment device “G-ace” **prevents water pollution** by separating and collecting the oil from wastewater that contains oil, and also contributes to the **conservation of the water environment**. The waste such as waste oil which needed to be processed can be separated into concentrated waste oil and treated water that can be discharged directly into the sewer etc.

Applications

“Hybrid water purifiers” are being used to secure drinking and domestic water in areas away from cities, where electricity and drinking water infrastructure are inadequate. It is anticipated that they will be used at island hotel and resort locations etc. “G-ace” is suitable for treating oily wastewater at factories that perform machining and the inhouse treatment of oil-impregnated wastewater has been very well received by customers looking to reduce costs.

Strengths

● **Obtaining stable drinking water and domestic water**

The “hybrid water purifier” makes use of water purification technology developed by our company, including for seawater desalination, and can even purify river water containing salt and a lot of turbidity, and well water. Stable operation is enabled by supplying stable power by a combination of commercial power, storage batteries and renewable energy, and by optimizing operation and maintenance by remote monitoring.

● **Oil removal using ozone microbubbles**

The oil-impregnated wastewater treatment device “G-ace” floats and separates the oil in wastewater using ozone microbubbles. It can also efficiently process the mineral oils, animal and vegetable oils and emulsified oils contained in oil-impregnated wastewater. It has already been introduced in Japan and China, and we are working to spread it throughout Southeast Asia in the future, with a focus on Vietnam.

● **Handling all your needs from proposal to maintenance**

We are skilled at proposing the optimal water treatment solutions in line with customer needs, and providing for all of your needs, including after-sales maintenance.



KES Co., Ltd.



The company growing with a society and customers

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<https://www.kes-21.co.jp/contact/>

Major Overseas Bases

Active in Vietnam

Our company established a representative office in Hanoi in 2017, where we have been conducting market research. It is our hope that in the future we will be able to work to help the maintenance of water and sewage facilities and the maintenance of in-facility equipment in Vietnam. (YAMANE Hironori, Hanoi Rep office manager)



YAMANE Hironori,
Hanoi Rep office manager

Approaching the water environment with the “comprehensive capabilities” of our plant business, maintenance business and services and support business



▲ Abundant experience from the design of water treatment facilities to after-sales follow-up



▲ Providing advanced technology with a commitment to safety, technology and quality

Effectiveness

Our company is developing our business around the three pillars of our **plant business** for the design and construction of water and sewage facilities, **O&M (maintenance) business** operating and maintaining machinery and equipment, and **service and support business** performing equipment repair, facility repair and patrols, maintenance and inspections.

We provide professional services from design to after-sales follow-up for **water purification plants, sewage treatment facilities and urine treatment facilities**, and contribute to the **stable supply of safe water** and the **prevention of water pollution from wastewater**.

Applications

We are developing an operations management support business not only for the maintenance of water and sewage networks in urban areas, but also for industrial parks with water treatment facilities.

We have a track record of implementing feasibility studies on remote support for water and sewage facility operations in Vietnam.

Strengths

● **Strengths of “Comprehensive Capabilities”**

Our strength is our “comprehensive capabilities” in the three water and environment related businesses of plant construction, maintenance and management (operations management, inspection and maintenance, circulation inspection), and after-sales follow-up (equipment repair, reform, disassembly and maintenance, plumbing work and equipment manufacturing). We provide optimal solutions for the conditions at each site, by coordinating these three businesses

● **Many years of experience and external collaboration**

We have worked as a regional partner in water related businesses for more than 40 years since our founding and have many years experience in collaboration with local stakeholders. We are also expanding into Vietnam as a partner agency to a major Japanese plant maker.

● **Providing technology overseas**

To provide professional services beyond geographical constraints, we are working on the provision of remote support using IT for the operation of overseas water and sewage/industrial wastewater treatment facilities. We are also focused on bring personnel from Vietnam to train engineers.



KOYOH Co., LTD.



Verifying effectiveness and achieving reliable results

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It has already been 10 years since we began research and development into the purification of tidal flat sludge by fermentation and humus of sewage sludge and thinning that had been incinerated. The practical operation finally commenced last summer. Because this involves nature there are still some points to be improved, but it has been possible to increase marine resource root species such as Japanese littleneck clams and hard clams etc. In the future, we want to work with a university team, government and fishery cooperatives to make improvements and to find the best installation methods for different conditions in various sites. (KOGA Masayuki, Director)



KOGA Masayuki, Director

“Ryugu no Tsukai”, a water purification product that converts sludge into seafood bait



Water purification product (Ryugu no Tsukai)



▲ Main component – Fulvic acid iron silica



▲ Effective for sludge purification and clam recovery



Before installation



1 month after installation

▲ Easy to construct to purify water environments on tidal flats or fish cages etc.

Effectiveness

“Ryugu no Tsukai” is a water purification product that can convert sludge into seafood bait.

The main component is Fe-Fulvic acid silica, which, when placed in water, breaks sludge down with the oxidizing power of ferrous iron. Also, the supply of silica at the same time promotes the growth of diatoms which are preferred by shellfish, small fish, and crustaceans. The presence of shellfish has a particularly synergistic effect on tidal flat purification and the maintenance of marine ecosystems.

“Ryugu no Tsukai” is capable of **converting about 10 cm of sludge per year into seafood bait.**

Applications

This can be used to break down sludge in closed waters such as bays and lakes where eutrophication is proceeding. In addition, by oxidizing ammonia and nitrite nitrogen into nitrate nitrogen in seafood farms, it is possible to reduce the seafood mortality rate.

Strengths

● **Supplying seafood while improving the environment**

A major feature is that it can break down sludge to supply food needed by living organisms, while suppressing the occurrence of nitrite, which is harmful to living organisms. Not only does this improve water environments, it also contributes to increased catches for fisheries and aquaculture.

● **Inexpensive and easy to purify**

This product can be used by just placing biodegradable bags containing the product on tidal flats or in fish cages. The conventional sludge treatment method of collecting sludge by ship and transporting it offshore is costly, but with “Ryugu no Tsukai” it is possible to process about 2,000 m² of sludge for about 500,000 yen.

● **Utilizing plants as raw materials**

The main component of fulvic acid is produced from plants such as trees, bamboo and grass etc. Also, by reusing sewage sludge we can effectively use minerals such as iron, silica and magnesium contained in the sludge.



Water

Sanki Engineering Co., Ltd.



Contributing to the promotion of the SDGs over the world with our reliable technology!

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Major Overseas Bases

Active in Austria

We have placed the management of environmental problems as an important issue and actively work to conserve the global environment. This proposed air diffuser has half the energy consumption of a conventional type, greatly contributing to the construction of a decarbonized, recycling-oriented society.
(HANDA Daisuke, Plants & Machinery Systems Headquarters)



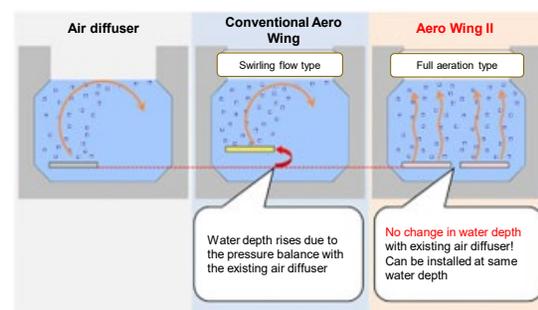
HANDA Daisuke,
Plants & Machinery Systems Headquarters

The “Aero Wing II” air diffuser realizes energy saving, low-cost sewage treatment with its high oxygen transfer efficiency

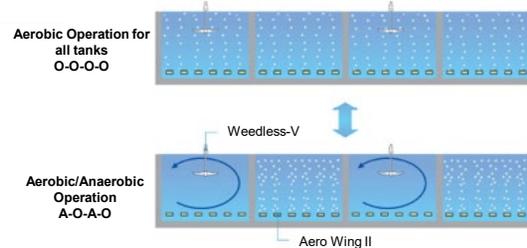
▼ “Aero Wing II”



▼ Adopted full aeration type



▼ Example of using the advanced processing method



Effectiveness

The Aero Wing II is a device that has a special synthetic resin diffuser membrane attached to a stainless steel plate achieving low pressure loss with high oxygen transfer efficiency. The amount of air blown and air blowing power can be reduced in comparison with conventional air diffusers, contributing to energy saving in sewage treatment.

In addition to the reduction of operating costs by saving energy, it is also possible to reduce initial investment costs because a pressure loss prevention device is not required.

It can also contribute to the improvement of the water environment by removing phosphorus and nitrogen because it can support advanced processing methods using an anaerobic/aerobic tank.

Applications

By introducing it to sewage treatment plants, appropriate sewage treatment can be performed while keeping energy consumption and costs down. We have a track record of having introduced more than 400 in Japan.

Strengths

● High oxygen transfer efficiency with ultrafine bubbles

With the foaming of ultrafine bubbles of around 1 mm, the gas-liquid contact area of the bubbles is enlarged, making it possible to reduce the amount of air blown and air blowing power with oxygen transfer efficiency more than twice that of existing air diffusers (conventional air diffusers).

● Full aeration type dispersion method

Because of the low ventilation resistance of the Aero Wing II during operation, the diffused water depth can be lowered allowing the operation of the fully aerated diffuser method. Adopting the full aeration type with higher oxygen transfer efficiency than the swirl flow type, a further reduction of air blown and air blowing power is possible.

● Compatible with advanced processing methods

The pores are closed when the air diffusion is stopped so as not to cause clogging. Therefore, intermittent operation is possible as a measure against bulking. Also, given the ability to disperse air during aerobic operation and stop dispersing air during anaerobic operation, advanced processing methods using anaerobic/aerobic tanks are possible.



JFILS Co., Ltd.



Working on the world's water pollution problems with new technological concepts!

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Major Overseas Bases

Active in Vietnam (Hanoi)

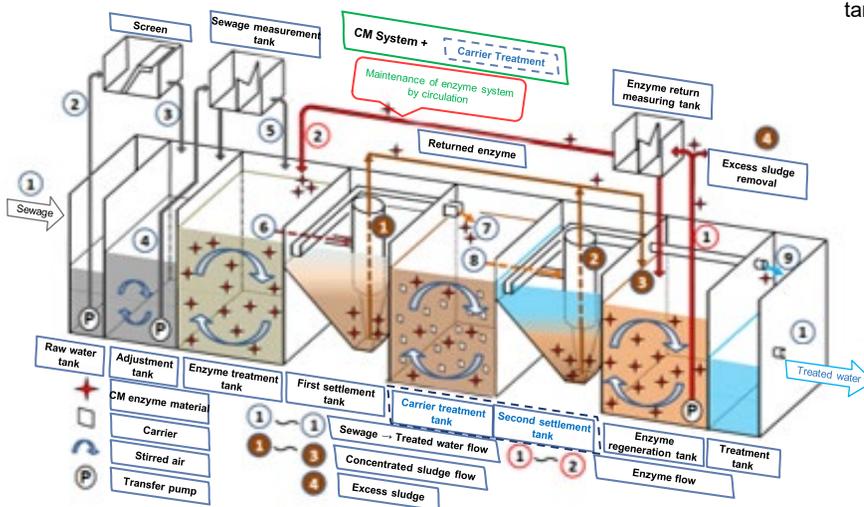
As economic development progresses, river and ocean pollution is becoming more serious, and there is also an urgent need to reduce CO₂. We hope to conduct joint research and development into enzyme circulation CM system facilities suitable to your country and to contribute to solving various problems. (TANI Kazumi, Representative Director)



TANI Kazumi, Representative Director

Utilizing the catalytic action of enzymes! High-efficiently water treatment using the enzyme activation method

▼ Overview of water treatment using the enzyme activation method



▼ Results of high-concentration waste liquid treatment from a food factory (Top: immediately after collection, Bottom: 2 hours after collection) From left: Raw water tank, aeration tank, discharge tank



Effectiveness

The enzyme circulation CM system developed by our company promotes the decomposition of organic matter in raw water by the action of enzymes, making **it is possible to treat wastewater with high organic concentration**, which is difficult to treat with the standard activated sludge method. Also, since it is resistant to changes in the environment it can be treated stably regardless of changes in raw water concentration. Furthermore, the ability of the enzymes to decompose is a major advantage to **deodorize sludge odor**.

The amount of sludge generated with the enzyme activation method can be reduced to about 10-30% of that from the standard activated method, contributing to **the reduction of sludge landfill disposal** and **the reduction of CO₂ emissions from sludge incineration**.

Applications

BOD can treat 1,000-10,000 mg/L of raw water. It can also be used in a wide range of pH and water temperatures, making it effective for treating various organic wastewater including food factory drainage. Please contact us if you have any issues with odor control and processing costs.

Strengths

● **Wide range and easy management of raw water**

Organic matter can be efficiently decomposed by adding enzyme materials, making it possible to treat raw water containing high concentrations of organic matter. By adding the action of enzymes in addition to the function of microorganisms there is no need for advanced microbial control because it becomes resistant to changes in the environment and can respond to such changes.

● **Deodorization with the action of biocatalysts (enzymes)**

The standard activated sludge method can cause issues for the neighborhood such as sludge odor but the enzyme activation method can contribute to odor control by decomposing the substances that cause odors with the action of enzymes.

● **Realization of reduced CO₂ emissions by reducing the volume of excess sludge**

With the standard activated sludge method, about 80% of the generated sludge is occupied by dead microorganisms, requiring a lot of energy for disposal. On the other hand, since the action of enzymes breaks down dead microorganisms with the enzyme activation method the amount of sludge generated can be reduced to about 10-30%. Also, since much of this is made up of inorganic matter, another feature is that it can be dried in the sun, further reducing CO₂ emissions.



Nikka Environment Engineering Japan Co., Ltd.



Providing customer satisfactions with trust and reliability

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Major Overseas Bases

Nikka Environment Engineering Limited (Hong Kong)
Shenzhen Nikka Water Engineering Ltd. (Shenzhen, China)
Shenzhen Nikka Environment Engineering Ltd. (Shenzhen, China)

We are a company that operates mainly in Japan and Asia, engaged in the manufacture, sale, and foreign trade of environmental equipment, including the construction, maintenance and management of environmentally friendly plants. The product here is used as an additive developed for the processing of persistent COD in factory waste liquids which greatly reduces the cost of waste liquid processing.

(AMARI Masahide, Sales Manager)

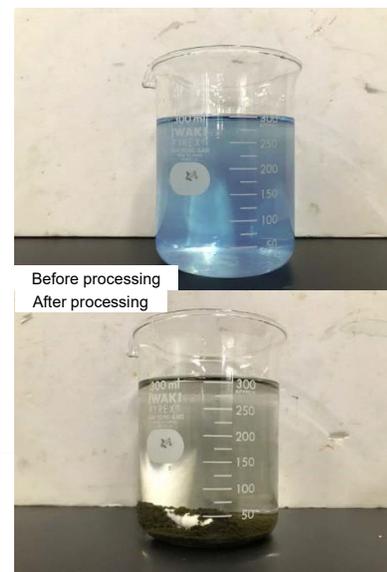


AMARI Masahide, Sales Manager (left)

“Cotalyst BP” reducing process costs for persistent COD decomposition



▲ Appearance of Catalyst BP. A moist black powder that disperses well in water



▲ Decomposes not only COD and TOC, but also metal complex. The supernatant water is colorless and transparent after the copper ions are processed

Effectiveness

Fenton processing is a method for processing industrial wastewater by decomposing organic matter with the strong oxidizing power of the reaction of hydrogen peroxide and iron.

Cotalyst BP is a catalyst that greatly improves the efficiency of this Fenton processing. Even organic compounds that can be difficult to decompose with conventional Fenton processing can be decomposed, improving processing efficiency and contributing to water quality conservation in rivers and seas. It is also possible to reduce the volume of waste liquid, and to reduce the cost of processing and amount of sludge generated.

Applications

Effective against various industrial waste liquids such as plating waste liquid, developer from the semiconductor manufacturing process and dimethyl sulfoxide waste liquid etc. COD standards are becoming stricter in Asian countries such as China, and this can be used to keep drainage below standard levels.

Strengths

● **COD processing cost reduction**

By adding Cotalyst BP to processing it is possible to reduce the volume of waste liquid, and because the reaction is streamlined it also reduced the amount of iron salt required in the wastewater for Fenton processing. There is also a cost of processing associated with a lot of persistent COD, and this can also be reduced. Even considering introduction costs, you can recover your investment in about a year.

● **Decomposes various substances**

In addition to being able to decompose organic compounds that are difficult to process with the conventional Fenton processing method, metal complex can be decomposed and precipitated and separated as metal hydroxide. It also has the effect of decomposing the hydrogen peroxide that remains from Fenton processing.

● **Easy to install**

Can be used with only slight modifications to existing equipment. Our company provides the catalyst on its own and also supports the installation and remodeling of processing equipment.



Nikken Kensetsu Co., Ltd.



Solving water and climate change issues in emerging countries with our technologies

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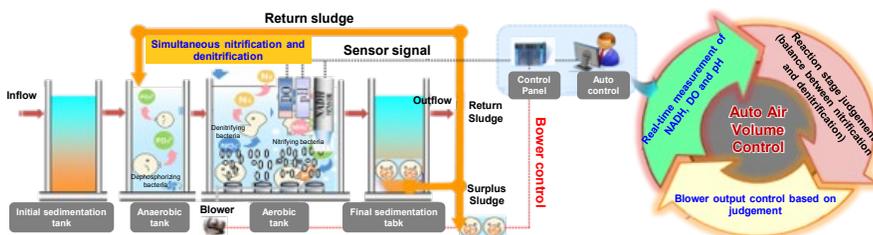
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We are a company located in Kitakyushu, an industrial city that has overcome pollution. We provide technologies that contribute to the creation of a sustainable community and want to take concrete measures to protect the richness of the sea with clean water, and to prevent global warming by reducing CO₂ through energy saving. (SUGASAKA Kazumi, Representative Director)



SUGASAKA Kazumi, Representative Director

Directly grasp the respiratory reaction of microorganisms! **“NADH air volume control system”** advanced sewage treatment



Item	Units	Anaerobic anoxic aerobic method using NADH air volume control (AZO method)	General anaerobic anoxic aerobic method (A2O method)
Reaction tank capacity image	—		
All reaction tank HRT	Hours	8~10	About 16-18
Anoxic tank HRT	Hours	1~1.5	6~7
SRT	Days	7~14	19~26
ASRT	Days	5~10	11~14
MLSS	mg/L	2,300~3,000	2,000~3,000
Nitrification liquid circulation rate (excluding sludge return rate)	%	70 Operating range 40~100	100~150
Nitrogen removal rate	%	Average removal rate 79	About 70

*Cited from Japan Institute of Wastewater Engineering and Technology (JIWET) Technical Manual

▲ Reduced reaction tank staying time and nitrification liquid circulation rate

▲ Can be installed in existing aerobic tanks

Effectiveness

The NADH air volume control system **automatically controls the optimal air volume** in an aerobic tank, as an advanced processing technology that removes **not only organic matter but also nitrogen and phosphorus**. By installing an NADH sensor, DO (dissolved oxygen) sensor and pH sensor in existing aerobic tanks, the microbial metabolism and respiratory information from each sensor can be measured in real time to control the air volume.

With automatic water quality measurement and air volume control, as well as the use of ICT technology, this not only contributes to **the improvement of ocean and river water quality**, but also contributes to the **reduction of CO₂ emissions and chemicals used due to labor saving and energy saving**.

Applications

This system can be applied to sewage treatment facilities, rural wastewater treatment facilities and factory wastewater treatment facilities etc. It is suitable for facilities looking to improve their nitrogen/phosphorus removal performance or processing efficiency.

Strengths

● **Maintaining optimal processing status in reaction tanks**

Living organisms live by oxidation and reduction metabolism, and both NADH (nicotinamide adenine dinucleotide) reduction coenzyme and oxidizing coenzyme (NAD) both forms exist within cells. By measuring the NADH value of microorganisms in activated sludge with a fluorescence wavelength measurement NADH sensor it is possible to grasp the environment inside the tank in combination with the pH/DO and automatically adjust the amount of air in the tank in real time, constantly maintaining an optimal reaction environment.

● **Cost reduction**

There is no need to add a treatment tank to install in existing facilities. Also, by reducing the nitrification liquid circulation rate by about 50% processing efficiency can be improved, blower power consumption can be reduced by about 30% and the amount of added chemicals can be reduced, leading to reduced running costs.

● **Operation management labor saving**

Automatic control is conducted by using ICT technology, so labor savings can be made. It is also possible to manage remotely via the internet.



Water

FIRST SOLUTION Co., LTD.



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

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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 “Flocman” 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, “Flocman” 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 “Flocman”

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.



FujiClean Co., Ltd.



Utilizing our experiences to “protecting beautiful water” in your country

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Major Overseas Bases

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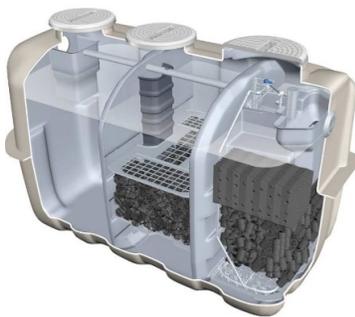
As a leader in septic tanks, our company has contributed to the improvement of sewers and water environments in Japan. With this experience and advanced technologies, we will continue to contribute to protecting the beautiful waters of the world.

(TABATA Yosuke, General Manager, Overseas Business Department)

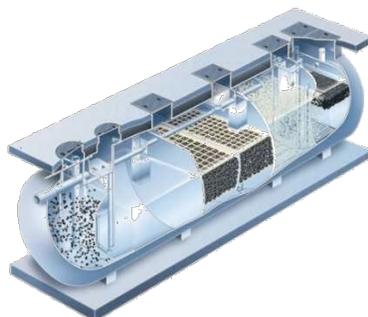


TABATA Yosuke, General Manager
(third from the right in the back row)

Reliably removing the odors and dirt from domestic wastewater with high quality septic tanks



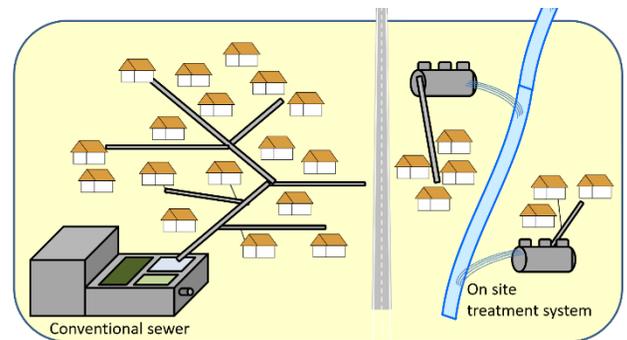
▲ “CE Model” small septic tank



▲ “PCN Model” large septic tank

	Before Processing	After Processing
BOD	200 mg/L	20 mg/L
Suspended solids (SS)	160 mg/L	20 mg/L
Total Nitrogen(T-N)	50 mg/L	20 mg/L

▲ Processing Performance



▲ Proposed septic tank implementation plan in combination with existing sewage treatment facilities

Effectiveness

Our company manufactures the **“CE model” small septic tank** and the **“PCN model” large septic tank**. In the treatment of domestic wastewater in Southeast Asian countries, often only solids are separated, and wastewater is often discharged as is in kitchens and showers and the odor of water and dirt at the point of discharge are a problem.

Our company’s septic tanks **remove odors and dirt** from such domestic wastewater, **improving water environments** and **preventing the eutrophication** of aquatic environments by further removing **nitrogen and phosphorous** with advanced processing.

Applications

Our products are effective for domestic wastewater treatment and can be installed in each home or incorporated into the sewage improvement plans of local governments. As a result, our products contribute to streamlining regional wastewater treatment.

We have a track record of installations all over the world (North and Central America, Europe, Asia, Oceania, Middle East, Africa).

Strengths

● **Designed for local conditions**

We have a long track record of installation of the CE and PCN models in Japan and have established models that are easy to maintain and use. We also propose wastewater treatment infrastructure depending on local conditions, to implement septic tanks that align with existing sewer networks.

● **High-performance, durable structure**

With high performance in the removal of BOD, suspended solids and total nitrogen, wastewater can be processed to a level that can be drained directly into rivers. This is a factory production type with stable quality. Also, through analysis and testing it is designed to be durable and strong against natural disasters.

● **Full maintenance support**

Septic tanks may not be able to fulfill all of their functions if not properly used or managed after installation. Our company visits sites regularly and provides construction guidance, maintenance of manuals, the holding of workshops and lectures to support maintenance.



METAWATER Co., Ltd.



Continue, to make it sustainable.

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Major Overseas Bases

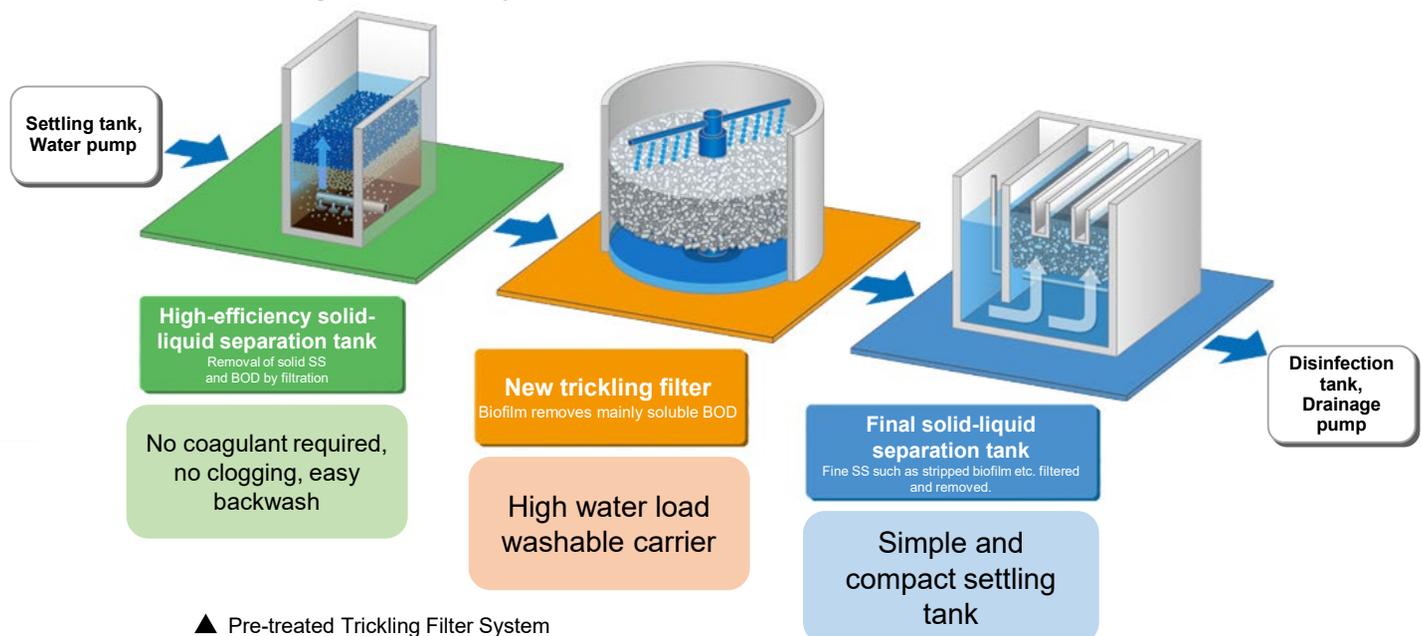
Vietnam, Cambodia, Singapore, USA, Netherlands

Overseas, the quality and costs required for water infrastructure differ for each country. There is a need to localize and customize our products and technologies according to the circumstances of each country. It is our goal to be a reliable presence for local construction, with a relationship of trust built on localism.
(SEO Shintaro, International Sales & Marketing Department)



SEO Shintaro,
International Sales & Marketing Department

Energy saving and stable water quality treatment with our “Pre-treated Tricking Filter System”



Effectiveness

“Pre-treated Tricking Filter (PTF) System” is a sewage treatment system that combines a high-efficiency solid-liquid separation tank, new trickling filter and final solid-liquid separation tank.

With solid-liquid separation and biofilm processing, BOD (biochemical oxygen demand) and SS (suspended solids) can be removed to levels that meet overseas water quality standards, contributing to **improved environment in public water areas** by the **proper treatment of sewage**. It also has **energy saving effect** compared with the conventional standard activated sludge method, and also contributes to the **reduction of greenhouse gases**.

Applications

Developed for emerging countries, this technology has received “technical confirmation for overseas use” from the Japan Sewage Works Agency and can be used to improve water quality and environmental hygiene in Asian countries.

We built a sewage treatment facility adopting the PTF system in a cooperation project with the Japan International Cooperation Agency (JICA) in Hoi An City (Vietnam).

Strengths

● Fast and stable sewage treatment

In the high-efficiency solid-liquid separation tank, a dedicated special windmill type filter medium with light specific gravity is used, with a performance of being able to process 50-80% of BOD and 60-80% of SS, with a large filtration rate of 1,000 m/day. Also, since no flocculant is required, there is no screen clogging, making it easy to maintain with simple backwash cleaning.

● Energy saving

Under the new water trickling filtration system, air is supplied to the processing tank by blowing water down from above. By this mechanism, the supply of air to aerate from the bottom layer in the opposite direction to gravity achieves a power consumption reduction of about 75% in comparison with the conventional standard activated sludge method.

● Simple and compact

The final solid-liquid separation tank has a structure with just a filter, making installation simple and compact. Combined with the effect of high-speed filtration in a high-efficiency solid-liquid separation tank, overall space savings can be achieved, and maintenance is easy and inexpensive.



Kawasaki Heavy Industries, Ltd.



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

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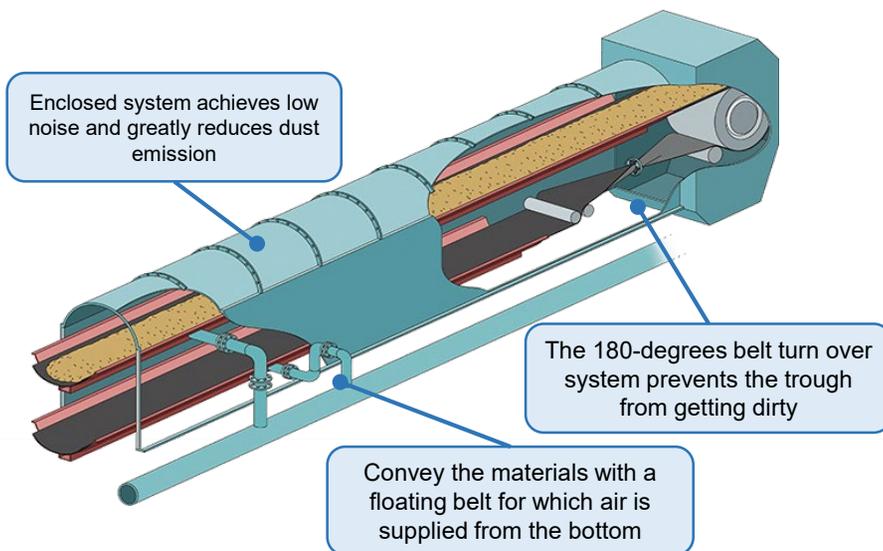
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<https://global.kawasaki.com/en/corp/profile/contact/index.html>

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)

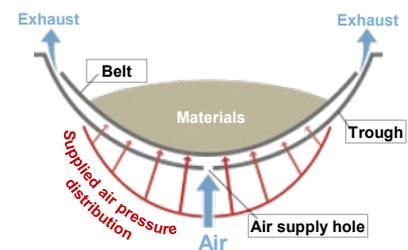


MIYAKE Maho, Energy System & Plant Engineering Company

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.



Seibu Giken Co., Ltd.



We always stay ahead of the rest of the world

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Major Overseas Bases

Seibu Giken (Changshu) Co., Ltd. (China)

We have a track record of more than 30 years of adoption of our VOC concentrator "SKY-SAVE" for various purposes around the world. We will continue contributing to environmental issues as a leading manufacturer of environmental and energy-saving equipment, with a focus on the improvement and updating of existing products and the development of new products. (OTA Yasutaka, Overseas Sales Department)



Seibu Giken Group

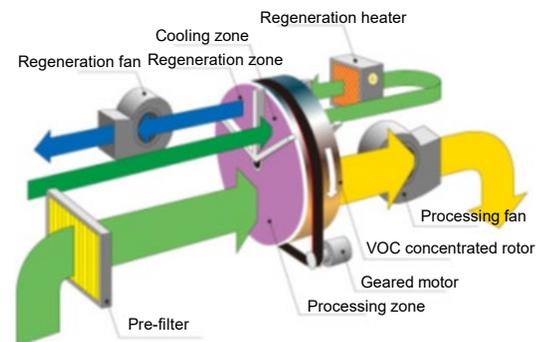
High-performance VOC concentrator "SKY-SAVE" with proprietary honeycomb manufacturing/zeolite support



▲ VOC concentration unit



▲ VOC concentrated rotor. Hydrophobic zeolite supports inorganic honeycomb.



▲ When exhaust containing VOC passes, the VOC is adsorbed and concentrated on the rotor surface. By passing a small amount of hot air, this can be recovered as high-concentration VOC gas.

Effectiveness

SKY-SAVE is a VOC concentrator for the efficient processing of **VOC (volatile organic compounds)** contained in factory exhaust from the use of organic solvents **by concentrating and reducing processing air volume**. By sending VOC concentrated exhaust gas to a combustion device, **efficient oxidative decomposition and detoxification treatment** is possible. This contributes to a **significant reduction in costs and for the processing of VOC and prevention of air pollution**, which is suspended particulate matter and causative photochemical oxidants.

Applications

SKY-SAVE is installed in locations with a large amount of VOC such as painting booths, printing factories, and semiconductor factories etc. In addition to Japan, we also have a manufacturing factory in Jiangsu Province, China, allowing us to smoothly respond to needs in China and other Asian countries. With an increased awareness of air pollution control, environmental regulations are being developed which are expected to lead to effective utilization in these areas.

Strengths

● High-performance VOC processing with proprietary technology

The SKY-SAVE rotor adsorbs and concentrates VOCs, obtaining a high concentration of VOC-containing gas by passing hot air through it. Sending this to a combustion device can lead to the minimization of fuel consumption and reducing VOC processing costs.

SKY-SAVE is used as a VOC concentrated rotor for hydrophobic zeolite with excellent VOC adsorption performance impregnated and supported into inorganic honeycomb and baked at high temperature. Seibu Giken has know-how in honeycomb manufacturing technologies accumulated over many years and zeolite impregnation carrier technologies patented all over the world, and SKY-SAVE brings these technologies together in high-performance VOC processing equipment. We are continuing further research while grasping the needs of the market.

● Support for various needs

The types of VOC that occur differ from factory to factory, and we can support the needs of your site in terms of the selection of optimal zeolites, design to meet removal efficiency needs, equipment miniaturization and energy saving etc. We also have many years of experience and a wealth of know-how in dealing with problems.



Chugai Technos Corporation



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

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Major Overseas Bases

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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.



BEC Kyushu Co., Ltd.



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

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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



▼ Special mist spraying and dust prevention effect



Before foam spraying

During foam spraying



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 10µm 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 µm), 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

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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 CO₂ 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.



MTEC Co., Ltd.



Reliable supply of raw materials to meet an increasing need for biomass fuel

Contact Address

1-3-6 Kumade, Yahatanishi-ku, Kitakyushu

Telephone/Email

+81-93-883-8130/zaitsu@mtec-inc.net

Major Overseas Bases

Active in Indonesia

The strength of MTEC Co., Ltd. is our established system through business partnership on PKS export with Indonesian state-owned enterprise and Union of Palm Operators of Riau Province which allowed total of 100,000 or more tons of export per month from multiple ports. (ZAITSU Masami, Representative Director)



OHATA Sho, General Manager

Stable supply of high-quality palm kernel shells (PKS) based on local networks

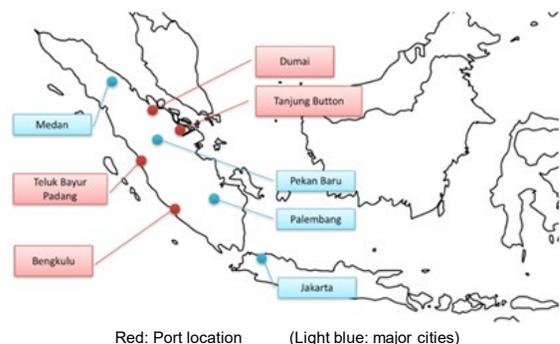
▼ Export port and foreign matter removal device



▼ Palm kernel shells (PKS)



▼ Export ports in Indonesia



Red: Port location (Light blue: major cities)

Effectiveness

Palm kernel shells (PKS) are a crop residue that occur in the process of palm oil production, and since it contains a lot of oil and has a high calorific value it is a suitable raw material for biomass power generation.

By substituting biomass power generation using PKS for fossil fuel derived power generation, this **suppresses CO₂ emissions from fossil fuels**, resulting in contributions to **solving the problem of climate change and the sustainable use of resources etc.**

In addition, promoting the proper and effective use of PKS contributes to **controlling the amount of waste generated** in emitting countries, and **reducing the environmental load** in waste processing.

Applications

We can sell PKS to government agencies and power generation companies that are considering the introduction of biomass power generation. We can also work with business operators considering exporting or selling PKS overseas.

Strengths

● **Stable procurement of PKS**

Our company carries out a PKS export business from Indonesia, and our rich export system of 100,000 tons per month or more makes it possible to provide a stable supply of PKS.

● **Ensuring high-quality PKS**

We have established a process when exporting from Indonesia to remove foreign matter including fiber and metals with a foreign matter removal device and also carry out on-site inspections to check for foreign matter mixed with the PKS to ensure that we supply high-quality PKS.

● **Abundant overseas experience and network**

We have a business alliance with an Indonesian state-owned enterprise (PT Perusahaan Perdagangan Indonesia), private enterprises and the Riau Sumatera Union of Palm Operators (ASPACASRI) and are building an export system based on collaborations with trading companies, palm plantations/factories and PKS suppliers. With this abundant experience and network, we can support the stable supply of high-quality PKS.



Kitakyushu Media System Co., Ltd.



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

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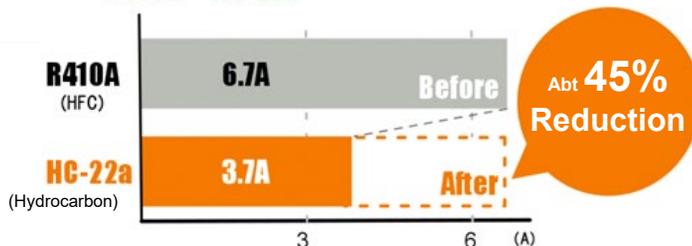
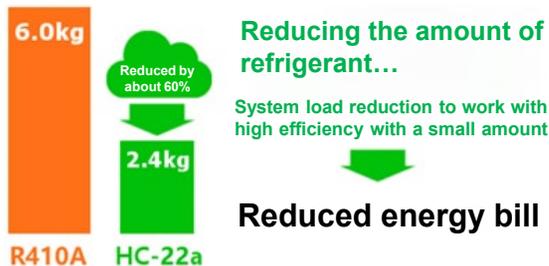
Since our founding in 1999 we have engaged in the construction of electrical equipment and communication equipment based in the Kitakyushu area, and are celebrating our 22nd year with the slogan of “treasuring connections between people.” We are deeply grateful to all of you for this. (NAKAYAMA Yasuhiro, 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 CO₂ 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.



Kyudenko Corporation



Providing a comfortable environment for our customers as the “comprehensive equipment business” that widely supports their lives

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+81-92-533-0300/k-shino@kyudenko.co.jp
Major Overseas Bases
Active in Singapore, Malaysia, Vietnam, Thailand, Taiwan, Indonesia, Myanmar

Utilizing the technologies and know-how cultivated as a comprehensive equipment business in Japan, we are working every day to provide comfortable living environments for people in Southeast Asia. (SHINOMIYA Kengo, EMS Team Leader, International Business Division, International Business Department)



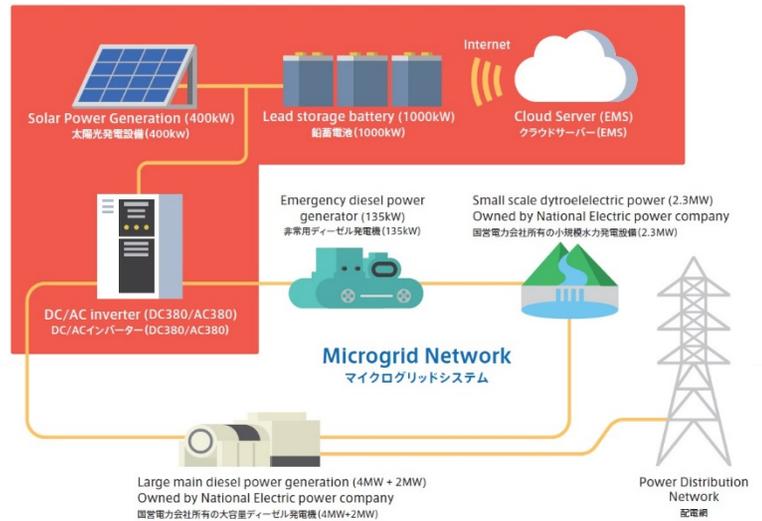
SHINOMIYA Kengo, EMS Team Leader (Second from the right)

Contributing to the stabilization of renewable energy with the “Kyudenko EMS”

▼ EMS demonstration facility in Sumba, Indonesia



▼ Illustration of introduction of EMS (Energy Management System)



Effectiveness

By substituting renewable energy such as solar power, wind power, biomass power and small hydropower for fossil fuel derived power generation, our services contribute to **suppressing CO₂ emissions from fossil fuels**.

We can also propose and construct energy saving equipment together with the construction of roof-mounted solar panels, realizing **energy saving for the entire facility** with the introduction of renewable energy. This also makes it possible to **reduce power costs** for the facility.

Applications

Our service can be provided to government agencies, power generation companies and developers considering the introduction of renewable energy power generation. We can also support the construction or maintenance of roof-mounted solar panels and energy saving equipment for factory personnel.

Strengths

● Achievements in the introduction of EMS

The “Kyudenko EMS” is a technology that delivers stable power to the grid for power generation such as solar and wind power that depend on the weather. For example, on remote islands where power generation facilities and power grids are limited, it is difficult to maintain stable power with unstable solar power generation, and this system uses a storage battery and dedicated systems to supply electricity 24 hours a day using renewable energy. We are currently working to spread this technology, mainly in Indonesia.

● Abundant achievements in renewable energy power generation equipment business

Until now, we have carried out the construction and maintenance of equipment for solar, wind, geothermal and small hydro power generation in Japan. We also support the construction and maintenance of renewable energy equipment overseas, based on our experience cultivated in Japan.

● Proposing energy saving for factories

We have abundant achievements in the design and execution of electrical equipment, distribution lines, air conditioning, water supply and drainage equipment and sanitary equipment as a comprehensive equipment company. When installing roof-mounted solar panels, we can diagnose the environment of the facility and make proposals on updating energy saving equipment which can be performed at the same time.



Shizen Energy Inc.



Aiming for the world of 100% renewable energy

Contact Address

3F Fukuoka Ohori Bldg., 1-1-6 Arato, Chuo-ku, Fukuoka

Telephone/Email

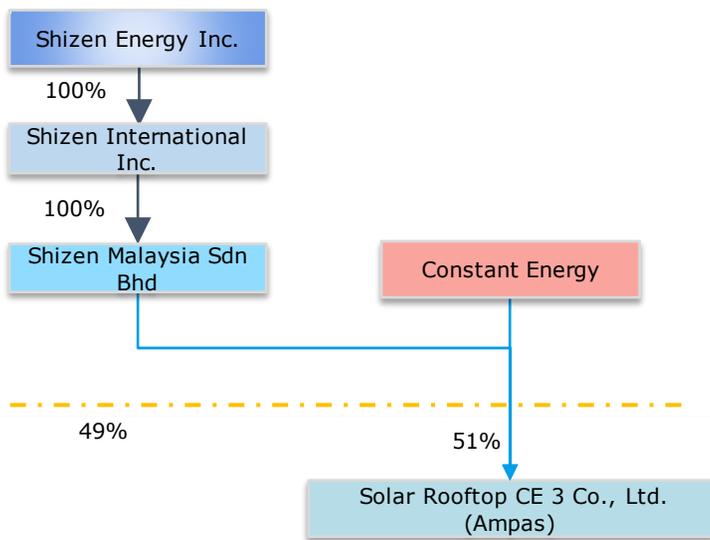
+81-92-753-9834/infomail@shizenenergy.net

Our company provides a service for both electricity producers and users, with the aim of realizing a world of 100% renewable energy. Please contact us if you are considering introducing solar power or reducing power costs in your factory. (USHIKUBO Rei, Overseas Division)



USHIKUBO Rei, Overseas Division

Providing low cost and clean power using with the Corporate PPA model of roof-mounted solar power generation



▲ Corporate PPA model mechanism (example)



▲ Example of the installation of a roof-mounted solar power plant

Effectiveness

Corporate Power Purchase Agreements (PPA) for roof-mounted solar power plants are long-term purchase contracts for the electricity generated from installed roof-mounted solar power plants.

Our company installs, owns and maintains the roof-mounted solar power plants, so they **can be installed at low cost** because there is no need to bear the initial investment cost or maintenance costs which are borne by power purchasers. Also, because electricity can be procured from the solar power plant long-term, this leads to **reduced electricity costs and a reduction in greenhouse gas emissions**.

Applications

Meeting the need for low cost, clean power procurement. The roof-mounted solar power plants can be installed in various facilities such as factories and schools.

Strengths

● **Fully implement work required for power plant installation**

The Shizen Energy Group has a track record of installing renewable energy power generation facilities in more than 70 locations throughout Japan. Our Group offers a full range of support based on our experience cultivated in Japan, including development, financing, EPC (engineering, procurement and construction), management and maintenance etc.

● **Able to quickly start business**

The feature of roof-mounted solar power generation in comparison to other large-scale renewable energy is that business can be started quickly. You can get started with a power generation business about 1 year after signing a corporate PPA.

● **Business performance in Thailand**

In July 2020, our company together with Constant Energy Co., Ltd. installed a production/industrial roof-mounted solar power plant (Capacity: total of 5MW) in the Bangpoo Industrial Estate under a corporate PPA with Ampas Industries Co., Ltd. In October 2020 we signed a corporate PPA with Aisin Thai Automotive Casting, and are developing our business in Thailand.



Energy

TTS Planning Co., Ltd.



Aiming for “regional development” and “contributions to the earth”

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+81-948-82-4936/info@ttsplanning.co.jp

Since our founding, we have been engaged in a lot of real estate development, contributing to the development of our region. We aim for “regional development” and “contributions to the earth” through continuing to promote the development of next-generation clean energy and taking on challenges to meet the needs of our times and region. (NOMIYAMA Toshiyuki, President and CEO)



NOMIYAMA Toshiyuki, President and CEO (left), NOMIYAMA Muneyuki, President's Office Manager (right)

Large-scale Biomass Power Generation using resources as fuel

- ▼ Biomass power plant (Image of the completion of the Karita Biomass Power Plant)



- ▼ Traveling Stoker system (Combustion system)



- A wide range of fuels can be incinerated due to its gentle combustion method.
- Suitable for power transmission businesses where there is little power in the facility.
- Easy to operate and repair due to its simple structure.

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Effectiveness

Biomass power generation contributes to the reduction of CO₂ emissions from fossil fuels by substituting for fossil fuel derived power generation. By utilizing a traveling stoker, a variety of waste resources can be used as fuel, including palm kernel shells (PKS) and construction waste etc. The effective use of waste as fuel can also contribute to **the reduction of landfill, and energy recovery.**

Aside from this, using wood chips produced from unused wood as fuel can realize the **stable supply of electricity from the effective use of local forest resources.**

Applications

In cooperation with power generation companies, operators considering the introduction of biomass power generation for private consumption, and companies aiming to popularize renewable energy, we would like to further develop our overseas power generation business and fuel procurement business etc.

Strengths

● Biomass power generation business in Japan

In 2019 we established “Nihonkaisui TTS Karita Power Co., Ltd.” for the purpose of the construction and operation of a 50MW output large-scale biomass power plant. We plan to commence operation of the biomass power plant in Fukuoka prefecture in 2023.

● Able to use a variety of biomass resources

Because of the combustion method using a traveling stoker, various forms, properties and moisture content of biomass waste resources can be used as fuel in comparison with circulation flow methods. In addition to construction waste, palm kernel shells (PKS) which are generated in Southeast Asia and wood chips from various types of wood such as acacia can be used as fuel.

● Building systems rooted in the community

Utilizing our know-how of urban development accumulated through our real estate development business, we aim to develop power generation businesses rooted in the region. We are also considering building a mechanism to use agricultural waste heat for the generation of biomass power (for the temperature control of greenhouses etc.).



West Japan Engineering Consultants, Inc.



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

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eigyoun-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

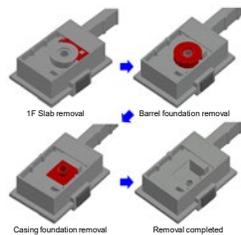
Provision of various consulting services necessary for the introduction of renewable energy power generation

▼ Example of hydropower design work

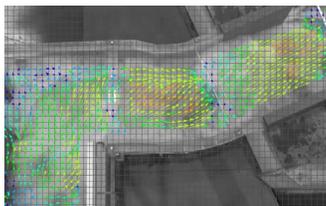
< investigation in a narrow waterway using a robot >



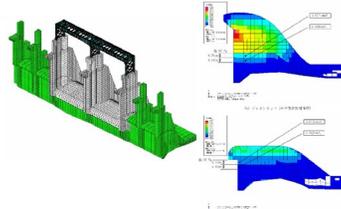
< construction plan using 3D-CAD >



< construction plan using 3D-CAD >

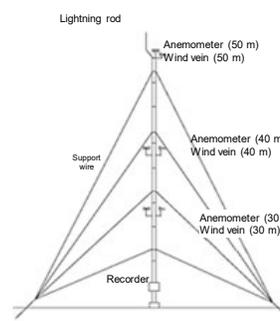


< checking stress and displacement by the FEM analysis >

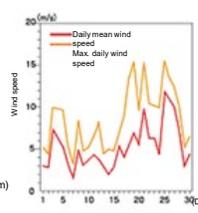


▼ Example of wind observation at wind turbine planned construction site

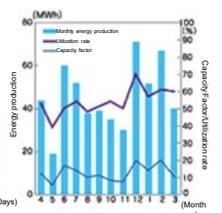
Schematic diagram of wind condition observation tower



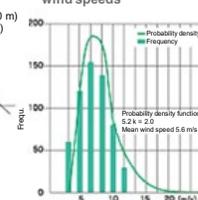
Mean wind speed



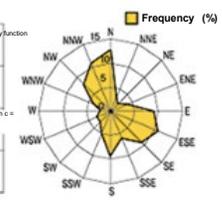
Energy production



Frequency distribution of wind speeds



Wind rose



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 CO₂ 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.



ProX Material Corporation



Creating a comfortable environment against global warming progresses

Contact Address
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+81-92-885-3722/info@syonetu.biz

Our company develops, sells and manufactures “Professional grade” heat shield sheets. Also, our patented construction method can build most steel structure buildings quickly, cheaply and neatly, with beautiful finishes and no damage. We can also show you model homes. Please feel free to contact us! (INOUE Tetsukazu, President)

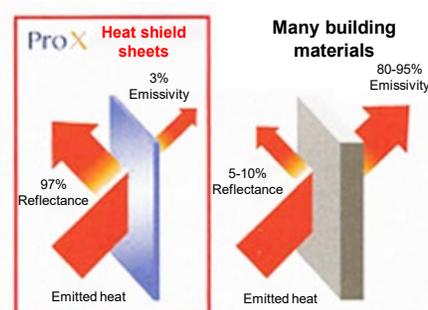


INOUE Tetsukazu, President

Energy saving and work environment improvement with “ProX Heat Shield Sheets”



▲ Can be installed cheaply, quickly and neatly in most steel structures with our patented construction method.



▲ Reflects 97% of radiant heat



▲ We also have sheets to improve the thermal efficiency of machinery and equipment and to prevent dew condensation in refrigerator/freezer equipment.

Effectiveness

ProX heat shield sheets are heat shield sheets made of double-sided aluminum reflecting 97% of radiant heat. By installing in the underside of the ceiling and in walls, it shuts out the heat from outside air during summer and prevents heat in the room from escaping outside in winter. It also contributes to **energy saving and reduced greenhouse gases** because of improved operating efficiency of air conditioning.

Also, by installing in machinery and pipes, it is possible to **improve the thermal efficiency of industrial processes**. Further, by suppressing the rise in room temperature due to mechanical exhaust heat, this leads to **improved work environments for workers**.

Applications

This product has a significant effect on energy saving and the improvement of working environments in factories and warehouses with large spaces using little insulation. It can also be used at any building such as offices, stores, facilities and homes, etc. It is also possible to construct in existing buildings and is not limited to new construction.

Strengths

● **Semi-permanent effect by constructing in walls of rooms and roofs**

Has high durability with sandwiched aluminum with 99% purity or higher which is hard to tear and the application of anti-corrosion coating. Since the main component is aluminum, it can be recycled after use.

Since heat is shielded without using energy such as electric power, the effect is semi-permanent immediately after construction. We have a track record of obtaining energy efficiency improvement effects of 15% or more for drying furnace construction and cooling effects of about 7 degrees in house construction.

● **Advanced construction technology**

Our patented construction technology can be installed in a short amount of time with low noise. It can also be installed neatly, due its being lightweight and having the right thickness.

We have developed breathable and waterproof heat shield sheets that can also be implemented on wooden buildings.

It can also be implemented on rental properties since it is easy to recover to its original state if necessary. We also offer full after-sales service.



Hokutaku Co., Ltd.



Improving profitability and the future for our children

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Wakamatsu-ku, Kitakyushu

Telephone/Email

+81-93-701-5820/ hs000@hokutaku-co.jp (Rep.),
hs130@hokutaku-co.jp (Person in Charge)

Major Overseas Bases

Active in Germany

As the only multi-vendor large-scale wind power generation facility in Japan, we perform operation and maintenance (O&M) on domestic and overseas wind power generators. In addition, we are working to have local communities become familiar with wind power generation and working on job creation and community building to promote decarbonization and the spread of wind power generation at home and abroad. (ITO Yoshitaka, Deputy Chief General Affairs Department)



Kitakyushu branch

Multi-vendor wind power maintenance service

▼ Wind power generator for maintenance technology research and experiments



▼ Example of repair to a damaged blade



Effectiveness

Wind power generation operations and maintenance prevents turbine accidents such as blade scattering and contributes to the spread of wind power generation by supporting its stable operation. The spread of the renewable energy of wind power **can contribute to the reduction of CO₂ emissions derived from fossil fuels.**

In addition, as wind power generation can be used for domestic energy in various countries, it is also expected that power generation will be **profitable for the country.**

Applications

Our service can be provided to government agencies and power generation companies considering the introduction of wind power generation. We can also work with business operators involved in the manufacture and sale of wind power generators.

Strengths

● **Proven track record of wind turbine maintenance**

Our company's main business is the maintenance of wind power generators and we can support the maintenance of a wide range of wind power generators in Japan and overseas. We can respond to wind turbine blade repair, preventive maintenance technology, wind power generator tuning and customization and careful periodic inspections.

● **Provision of services including operating rate guarantee**

By providing maintenance and preventive maintenance as well as a comprehensive operation rate guarantee, we provide a service that guarantees a constant wind power operation rate. We contribute to improving business feasibility by providing an operation rate insurance and property/profit insurance linked to our advanced maintenance technologies and maintenance levels, and our operating rate guarantee.

● **Have wind power generator for technical research and experiments**

We have wind power generators for the technical research on maintenance and experiments. The generators are used for maintenance training and experiments on new technologies and products. We work to improve our wind power generation maintenance skills through technical training and demonstration tests for new technologies etc.



Maeda Road Construction Co., Ltd.



We help build roads in a way that values the natural environment!

Contact Address

5F Higashi Hie Business Center III, 4-2-10 Higashi Hie, Hakata-ku, Fukuoka

Telephone/Email

+81-92-411-9421/https://ssl.maedaroad.co.jp/contact/

Major Overseas Bases

Major Export Destinations: Active in Vietnam, South Korea, Singapore, Philippines, Indonesia, etc.

In 2030 our company will celebrate its 100th anniversary. We will continue building roads that are friendly to people and the environment, with our corporate philosophy of “realizing our mission of contributing to the broad development of social capital and to the improvement of the rich life of communities.” (KUBOTA Shinji, Kyushu Branch)



KUBOTA Shinji, Kyushu Branch

“AQUA PATCH” all-weather, highly durable, cold asphalt mixture

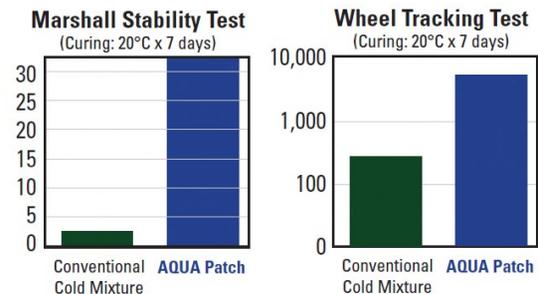
▼ “AQUA PATCH” package and usage method



▼ Example of construction in pothole



▼ Comparison of stability of conventional cold asphalt mixture



Effectiveness

Unlike heated asphalt mixtures, our all-weather, highly durable cold asphalt mixture (AQUA PATCH) can be laid at room temperature, **reducing the energy** that is consumed with road repair work and contributing to the **reduction of greenhouse gas emissions**.

Also, plant-derived ingredients are used for some of the raw materials, **reducing reliance on fossil fuel resources**.

In addition, AQUA PATCH has the same level of durability as conventional heated asphalt mixtures so it can be used on roads for a long time, allowing **roads to be used safely over a long period of time with few resources**.

Applications

This product can be used for road construction and the repair of road surfaces for airports, schools and shopping malls etc. It can also be used to repair road surfaces in emergencies such as disasters.

Strengths

● **Quickly open up to traffic**

Laying AQUA PATCH in construction sites with our proprietary technology and compacting after watering allows curing to be completed in 1 hour at room temperature. It is also possible to open traffic quickly after construction, contributing to alleviating traffic congestion.

● **Similar durability to common heated asphalt mix**

It is very durable compared to conventional cold asphalt mixtures, and has been confirmed to have more than 10 times the stability under the cold Marshall Test and more than 20 times the stability under the Wheel Tracking Test.

Also, it has durability similar to conventional heated asphalt mixtures.

● **Can be stored at room temperature and easy to carry**

We are developing bagged product which is also suitable for use in remote areas and islands. Since it can be stored at room temperature for about 6 months after manufacture, it is also very easy to store and manage.



Riamwind Co. Ltd.



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

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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)

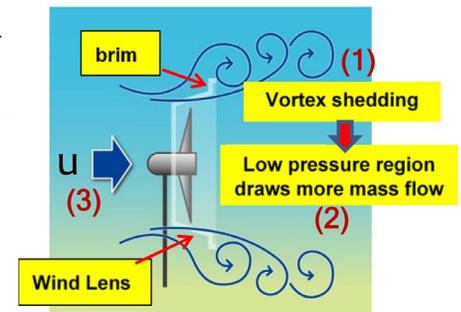
Multi-lens wind turbines realizing high efficiency, low noise and large capacity

▼ 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 CO₂ 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.



ATGREEN Co., Ltd.



Co-creation of measures with partners to solve local problems

Contact Address

Head Office: MIKAGE 1881 5F ACT
Matsunaga Bldg., 2-1-7 Uomachi
Kokurakita-ku, Kitakyushu, Fukuoka
Tokyo Office: No. 602 Bancho Royal Court, 23-
2 Ichibancho, Chiyoda-ku, Tokyo

Telephone/Email

0120-26-0589/info@atgreen.jp

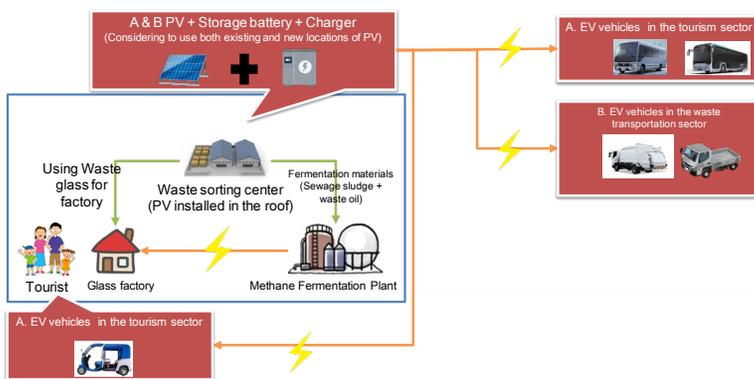
There are various issues facing countries and regions, and we work with partners in the fields of environment and energy to propose measures that lead to the resolution of these issues and want to support efforts that will lead to the development of business for both sides. Please feel free to contact us.
(TOMINAGA Seiya, Senior Manager, Consulting Department)



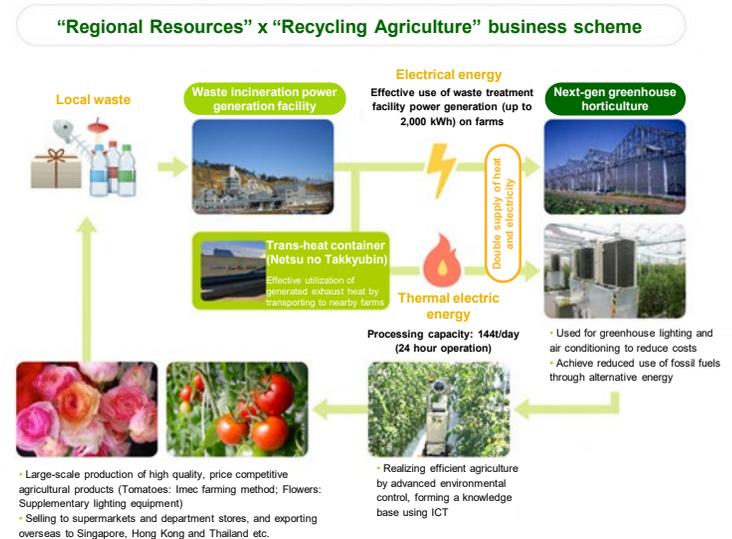
TOMINAGA Seiya, Senior Manager

Efforts to contribute to decarbonization and proposals for resource recycling systems based on local issues.

▼ Commercial feasibility study towards the introduction of EV passenger vehicles at tourist spots



▼ Example of a recycling-oriented agricultural system utilizing local resources (achievements in Japan)



Effectiveness

We propose initiatives and resource recycling systems that contribute to decarbonization leading to the solving of problems and sustainable development, depending on the characteristics and issues of the region. For example, we are considering a project to introduce EV passenger transport vehicles in countries with thriving tourism industries and biomass power generation projects using rice husks in countries and regions where rice farming is thriving. These efforts lead to the reduction of fossil fuel consumption, the promotion of decarbonization, improved resource efficiency and the creation of local industry and employment.

Applications

We consult on methods that are most suitable to local circumstances after listening about the positions and aims of various parties such as private businesses, public institutions and agricultural cooperatives etc. We can also consult on the capacity building of government officials.

Strengths

● Proposing systems that meet local needs

We propose appropriate systems after conducting an examination of local market needs and environmental issues, the amount and abundance of waste generated, and waste and energy related legal systems etc. In addition to the use of technologies that can be introduced locally, we can propose systems that generate profits locally and incorporate the generation of employment etc.

● Collaboration with partner companies

We have rich networks with private companies throughout Japan (waste disposal companies, manufacturers, agricultural companies etc.) including waste treatment group companies. By collaborating with companies with various technologies and know-how, we can propose initiatives that contribute to decarbonization measures that are suited to the region and resource recycling systems. We can also handle cooperation between local governments and companies.

● Abundant achievements overseas

We have a track record of JICA private sector cooperation projects in Southeast Asian countries and island countries and intercity collaboration and demonstration projects with the Ministry of the Environment. We also have a track record in the field of agriculture and of efforts contributing to the achievement of SDGs.



Other

Environmental Technology Service Co., Ltd.



Utilizing our experience and networks “for the world and humanity”

Contact Address

2-4 Nakabarushinmachi, Tobata-ku, Kitakyushu

Telephone/Email

+81-93-883-0150/kankyo@kan-tec.co.jp

Major Overseas Bases

Dailen-Kyushu Environmental Science & Technology Co., Ltd. (China)

Responding to environmental problems is a global issue for both developed and developing countries. To solve these problems, it is first important to collect accurate information. Our company uses our many years of experience and our network to help solving these problems.

(TSURUTA Tadashi, President)



TSURUTA Tadashi, President

Environmental survey, measurement and analysis based on many years of achievements and advanced technologies



Water quality survey



GC-MS



Exhaust gas measurement



Automatic air quality measurement device



Soil gas survey



Environmental composition standard substances

- ▲ We have various analytical equipment for water quality, air and soil etc., and staff with high technical abilities, and provide environmental surveys, measurement and analysis, standard sample preparation, and consulting services.

Effectiveness

We perform various **environmental surveys, measurement and analysis** of water quality, air and soil, **prepare standard samples** for the calibration of analytical instruments and provide **consulting** on the reduction of greenhouse gases and environmental risks.

We have researchers with high technical abilities who can propose analysis methods tailored to our customer's needs. As a third-party inspection agency, we make full use of our advanced technologies and precision analysis equipment to **perform measurement and analysis with a high degree of independence, fairness and accuracy** and to **contribute to compliance with environmental regulations**.

Applications

We receive many requests, from private companies in need of environmental monitoring, to universities and research institutions that are difficult to carry out sufficient analysis or R&D with their own measurement and analysis equipment alone. We have commenced developing our business around local governments and Japanese companies moving into local communities.

Strengths

● Researchers with high technical abilities

From our background of a founder who devoted himself to ingenuity for measurement and analysis when Japan was at the height of its pollution problem, our researchers have worked hard to understand the principles of measurement and analysis methods, not just following manuals. This high level of technical ability has allowed us to provide highly trusted measurement and analysis.

Even for issues for which there are no environmental regulations, we work to provide technologies to solve problems, including providing analysis and consulting on what kinds of regulations and technologies will be created.

● Abundant achievements and trusted externally

In regions where it is difficult to collect reliable information about measurement and analysis companies, operators may make measurements themselves, but our company has established trust and abundant achievements in emerging countries in Asia, performing measurement and analysis with high reproducibility and objectivity.

● Breadth of knowledge and network

From our experience engaging in overseas business, we have contacts in emerging Asian countries, including China and Southeast Asia, and are also familiar with the trends of local environmental laws and regulations.



K.K. Investment Limited



Providing the cost-effective technologies created in Japan

Contact Address

1-3-1-203 Dojimaruru, Wakamatsu-ku, Kitakyushu

Telephone/Email

+81-93-600-0498/yoshida@aquars.com

Major Overseas Bases

Shanghai Soil Environmental Technology Inc. (China)

There is a tendency to believe that “Japanese technology has good performance, but costs too much,” but cost awareness is very important to environmental restoration. We will continue to provide materials with high-cost performance, contributing to the solution of problems. (YOSHIDA Noriyuki, Representative)



YOSHIDA Noriyuki, Representative

Processing for the insolubilization of heavy metals in soil by chemisorption



▲ The schwertmannite system insolubilizer with iron as the main material, and the hydrotalcite insolubilizer with aluminum and magnesium as the main materials. Anions are drawn inside, and cations are adsorbed on the surface.

▲ Construction example

Effectiveness

By applying adsorbent to soil contaminated with heavy metals, it is possible to **chemically stabilize and insolubilize the heavy metals**.

The adsorbent uses the schwertmannite system for which iron is the main raw material, and the hydrotalcite system for which aluminum and magnesium are the main raw materials. In both cases, selenium and arsenic are drawn inside the adsorbent as anions SeO_3^{2-} or AsO_4^{3-} , and cations such as Pb^{2+} and Cd^{2+} are adsorbed on the surface of the adsorbent, **preventing heavy metals in the soil from elution**.

Applications

This product can be used in places where measures are required for soil pollution due to heavy metals, where it occurs, such as at factory sites, around mines, and on agricultural land. We have a track record of conducting feasibility studies for JICA and JETRO in Thailand.

Strengths

- **Adjustment of chemicals according to pollutants**
Because it is insolubilized by chemisorption, it is also possible to deal with pollution from multiple heavy metals. The types and content of the heavy metals in contaminated soil are analyzed and the adsorbent is then adjusted and provided so that it is suitable to the construction site. This means that the adsorbent can be used without waste, and costs can be kept down.
- **Construction methods according to the application**
Because contaminated soil can be processed on site, there is no need to remove it for processing.

The adsorbent can come in various forms such as powder, granules and fibers, so the construction method can be determined based on the application. Granules and fibrous adsorbents can be used for passive purification (a processing method that uses environmental power such as water flow etc.), and the effect of insolubilization can be obtained simply by installing adsorbent in a net in the path of contaminated water.

The treatment of soil in multi-function embankments is also possible with the underdrain method and containments of contaminated soil from above and below with adsorbent.



Other

Shabondama Soap Co., Ltd.



“Protecting our health and clean water” with additive-free soap technology

Contact Address

2-23-1 Minamifutashima, Wakamatsu-ku,
Kitakyushu

Telephone/Email

+81-93-701-3181/
reiko-kawahara@shabon.com

The CO₂ emissions from peat fires in Indonesia are more than 1.4 billion tons per year, exceeding Japan's total annual CO₂ emissions, and the smoke damage is also a serious issue causing health damage and impacting the take-off and landing of aircraft, making this an international issue. Our soap-based fire extinguishing agent can effectively extinguish fires in an environmentally friendly manner, contributing to solving these problems.
(MORITA Hayato, president and representative director)



MORITA Hayato,
president and representative director

“Soap-based fire extinguishing agent” with low environmental load and high biodegradability



▲ Fire extinguishing demonstration and experiment



▲ Rather than synthetic surfactant, a low environmental load, highly biodegradable soap is used



▲ Vegetation recovers 10 months after combustion/fire extinguishing

Effectiveness

Fire extinguishing agents generally use synthetic surfactants, but the soap-based fire extinguishing agent developed by our company makes it possible to **extinguish fires while suppressing the impact on the ecosystem**. Due to the surface action of the soap, the fire extinguishing agent penetrates into the ground, efficiently extinguishing fires.

This **reduces CO₂ emissions** arising from forest and peat fires, while reducing environmental load. It also contributes to **solving smoke damage** due to forest fires.

Applications

Fire extinguishing activity is possible while suppressing residual harmful substances mainly for fires in forests and peat bogs. We have a track record of shipping fire extinguishing agents for peat fires in Indonesia as a project of the Japan International Cooperation Agency (JICA) to reduce CO₂ emissions from peat fires.

Strengths

● Control of the impact on the ecosystem

A fire extinguishing agent that uses soap instead of a synthetic surfactant. Because surface activity is lost by combination with natural minerals the impact on the ecosystem can be controlled. Using a fire extinguishing agent with synthetic surfactant can result in plants not growing after fires are extinguished in forests, but such problem can be prevented.

● Effective fire extinguishment by penetrating into the ground

Our fire extinguishing agent is foamed by sprayed water, adsorbing well into the fire and efficiently extinguishing fires. The surface-active effect of the soap penetrated into the ground which is effective for peat fires that are difficult to be extinguished just with water.

● Development to protect water

The development of our soap-based fire extinguishing agent to extinguish fires with a small amount of water began with the Great Hanshin-Awaji Earthquake, from the experience of the need to extinguish fires when roads and fire hydrants were separated and where water had to be used carefully. This know-how also led to the development of fire extinguishing agents for forest and peat fires.



Nishimu Electronics Industries Co., Ltd.



Looking for the best solutions for our evolution

Contact Address

Head Office: 1-2-1 Minoshima, Hakata-ku, Fukuoka
 Tokyo Branch: 8F Kairaku Bldg. (Higashiueno II) 2-7-5
 Higashiueno, Taito-ku, Tokyo

Telephone/Email

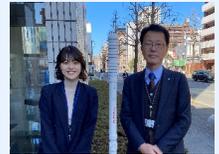
+81-92-482-4700/miharas@nishimu.co.jp

Major Overseas Bases

Active in Taiwan

I joined the company 1 year ago and have been working hard every day to provide sustainable solutions with MIHARAS for the problems and issues facing our farming customers.

Feel free to contact us, as we work hard with our customers to realize “attractive agriculture”!
 (WAKIYAMA Yuki, Solutions Center)



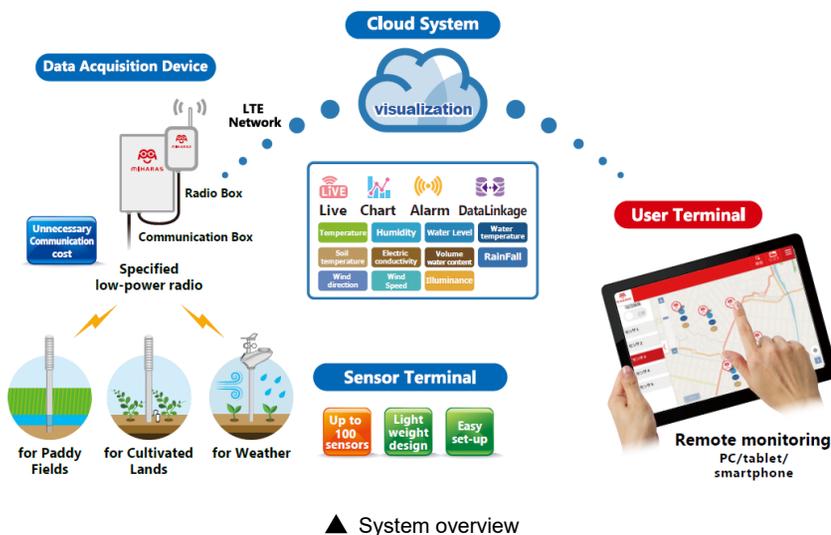
WAKIYAMA Yuki, Solutions Center (left)
 KOMOKATA Shigehiro (right)

MIHARAS agricultural IT sensors supporting field labor saving patrols and improved productivity

▼ Example of rice field sensor installation and measurement items



▼ Example of data display



Effectiveness

MIHARAS is a system that uses sensors installed in fields to measure the data required for crop production control, stores this data in the cloud, and makes it viewable any time on a terminal such as a PC or smartphone. This **allows farmers to always keep track of field conditions** and leads to **the consideration of effective measures to reduce the number of patrols and improve productivity**.

In addition, the daily collection and accumulation of data makes it possible to **quickly and accurately grasp changes to field environments** due to the effects of climate change and also contributes to the consideration of effective measures based on the data.

Applications

Aside from monitoring the conditions of rice fields, fields and greenhouses, etc., it can also be used to monitor the weather. We also consult with government agencies and local governments to promote smart agriculture.

Strengths

● “Visualization” of various data

Sensors installed in the field are able to measure various data such as the water level, water temperature, ground temperature and humidity and these values can always be checked. This data is then accumulated in the cloud and trends can be viewed in graph form. There is also a function to provide alerts based on self-set thresholds, to quickly detect abnormalities in the field.

● System introduction at low cost

Can be installed at low cost due to the use of sensors developed by our company and the fact that no communication costs are required between the sensor terminal and data collection devices with the adoption of special low power radio.

● Ease of sensor installation

The sensors have a slim and lightweight design in consideration of storability and portability making them easy to install. Sensor terminals are also easy for customers to set themselves.



Other

JMA Consultants Inc.



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

Contact Address

Head Office: 7F Japan Management Association Building, 3-1-22 Shibakoen, Minato-ku, Tokyo
Kyushu Office: 10F Nihon Seimei Hakata Ekimae Building, 3-2-1, Hakata Ekimae, Hakata-ku, Fukuoka

Telephone/Email

Head Office: +81-3-4531-4311/hiroki_ehara@jmac.co.jp
Kyushu Office: +81-92-472-0691/shigeto_ohsuyama@jmac.co.jp

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.

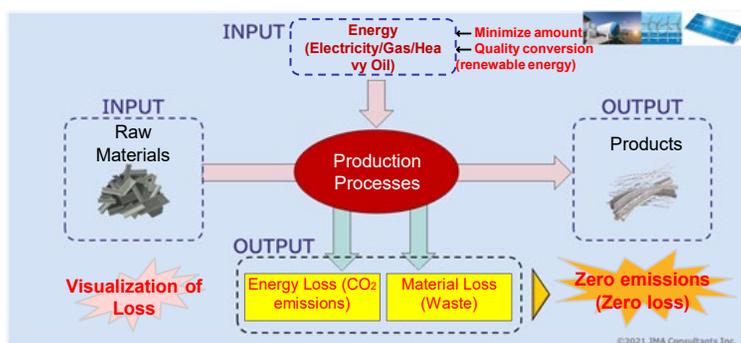
(EHARA Hiroki, Senior Consulting Planner, Business Development Office, Learning Consulting Business Unit)



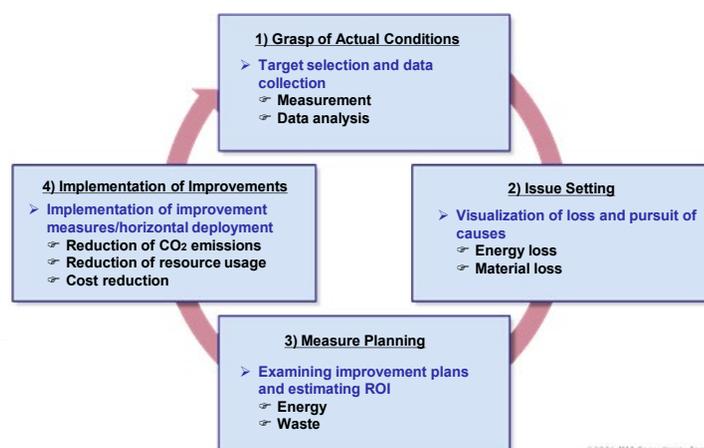
YAMADA Akira (left), EHARA Hiroki (center), SHIOBARA Yoshiyuki (right)

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 CO₂ 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.



Hasegawa Environment & Development Co., Ltd.



Technology capturing the needs of the world!

Contact Address

Head Office: 1-9-24-1001 Otemon, Chuo-ku, Fukuoka
 Tokyo Office: 9F Saiwai Bldg., 1-3-1 Uchisaiwaicho, Chiyoda-ku, Tokyo

Telephone/Email

+81-92-753-8620/oshima@smartcoat.jp

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.



Other

Futamura Chemical Co., Ltd.



Implementing environmental initiatives through business in a wide range of fields

Contact Address

5F NMF Hakata Ekimae Building, 1-15-20
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Telephone/Email

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Major Overseas Bases

Futamura UK Ltd. (UK)
Futamura USA, Inc. (USA)
FUTAMURA CHEMICAL MALAYSIA SDN. BHD.
(Malaysia)

This device has a highly efficient virus removal function using ozone. We provide comfortable spaces for medical institutions etc. that are impacted by COVID-19, to allow an unspecified large number of people to gather together.
(HOTTA Yasunori, Director/General Manager of Activated Carbon Division)

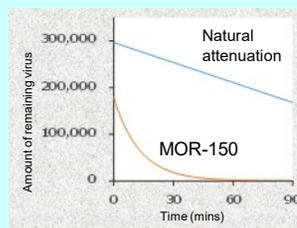
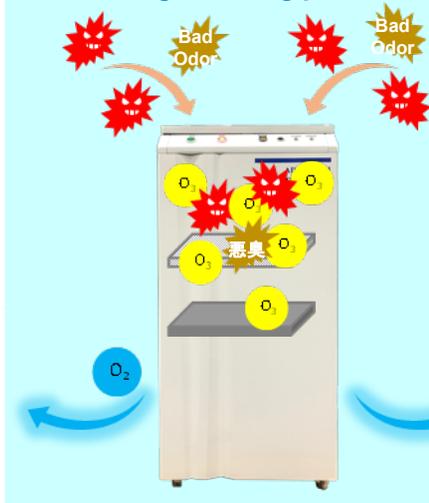


HOTTA Yasunori,
Director/General Manager

“MOR” virus removal and deodorizing device utilizing adsorption technology

● When there are people in the space...

Viruses are removed and deodorized in the device using the strong oxidizing power of ozone and special filters



[Test Institution] Kitasato Research Center for Environmental Science
[Test Method] Operated the MOR-150 in a test space of 25 m³, and changes in the amount of floating virus were measured
[Test Targets] Floating virus
[Test Results] Confirmed 99% removed after 60 minutes
Kitasei Issue 2020_0196

● When there are no people in the space...

Spray ozone at fixed times



Effectiveness

The Max Ozone Reactor (MOR) is a device that utilizes the sterilization and deodorizing effects of ozone and synergistic effects with the collection filter to remove and deodorize viruses and malodorous elements on filters.

Exhaust ozone is broken down by an excess ozone decomposition filter, allowing **viruses to be safely removed and deodorized**. By installing a Max Ozone Reactor indoors, you can contribute to **improving living environments** by **purifying the air with a three-layer structure**.

Applications

This device can be installed in places where people gather such as waiting rooms, offices, hospital rooms, examination rooms and restaurants and contribute to improving the indoor environment.

Strengths

● Utilizing experience and know-how in adsorption technology

Our company has a significant track record of the production and sale of adsorbents utilizing activated carbon and water and air purification filters with these adsorbents. The Max Ozone Reactor is a product that reliably utilizes these technologies.

● Air purification with a 3-layer filter

Air purification has a three-layer structure which (1) removes viruses with the ozone and virus collection filter, (2) ozone deodorization with a deodorizing filter, and (3) breaks down ozone emissions with the excess ozone decomposition filter.

● Can be used in places with people

Ozone exhaust from the device is broken down into oxygen by the excess ozone decomposition filter, so it can be used safely in places with people. Double safety measures are taken by also equipping the device with a standard function which stops the device when the ozone emission sensor detects the emission of ozone.

In Conclusion – For those interested in the listed environmental technologies

■ Inquiries regarding the listed environmental technologies

- If you are interested in the posted environmental technologies, please contact each company directly with their noted contact details.
- For inquiries from persons outside of Japan, please contact the prefecture's Environmental Policies Division, and we will try our best to connect you with each listed company.

Contact – Fukuoka Prefecture Department of Environmental Affairs, Environmental Policy Division

Email : kansei@pref.fukuoka.lg.jp

- Fukuoka prefecture also has overseas offices in Shanghai, Hong Kong and Bangkok. Feel free to contact these offices and we will try our best to connect you with each company.

<Shanghai Office>

Address: Room 2636 26F New Town Center Bldg., 83 Loushanguan Road, Shanghai, China

TEL : +86-21-3105-6376 Mail : shanghai@fukuokash.com.cn URL : <http://www.fukuokash.com.cn/>

<Hong Kong Office>

Address: Unit 702B, 7/F, New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui East, Kowloon, Hong Kong

TEL : +852-2869-9809 Mail : hongkong@fukuoka.com.hk URL : <http://www.fukuoka.com.hk/>

<Bangkok Office>

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TEL : +66-2-689-6200 Mail : fukuokabkkoffice@gmail.com

■ Notes about this Guidebook

- The companies listed in this guidebook were selected based on the results of a research on environment-related companies with bases in Fukuoka prefecture.
- The content of this guidebook is current as of March 2021.
- The content of this guidebook is created based on interviews with each company and materials provided by each company, and Fukuoka Prefecture makes no guarantee regarding the results or effects contained herein. Please make any decisions on entering into transactions at your own risk.

Guidebook on Technologies of Environment-Related Corporations in Fukuoka Prefecture

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