TROMSO SUSTAINABLE SOLUTION

TROMSO Co., Ltd.

Company Profile

Tromso Company Limited

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*All prices shown in this catalog exclude tax.

Company establishment history

Tromso was established as a spin-out from a manufacturer of heat exchangers for ships in Innoshima (Onomichi, Hiroshima Prefecture), where the shipbuilding industry is thriving. The founding members were four retired engineers from major shipbuilding companies who came together to utilize the shipbuilding skills they had developed up to that point in manufacturing on land.

Tromso was inspired by the words of a rice farmer who said, “I am struggling to dispose off the large amount of rice husks that are produced when rice is milled”. It is estimated that about 2.1 million tons of rice husks are generated every year in Japan, of which approximately 750,000 tons are unused. With the aim of making effective use of the rice husks generated every year, we developed and commercialized a rice husk solid fuel system, the 'Grind mill', which has become our core business.

In recent years, as a new pillar of business, the scope of our business has expanded significantly, focusing on rice husk utilization technologies, such as the development and manufacture of highly functional rice husk activated carbon, the development and sale of water purifiers using rice husk activated carbon, and the development of "biochar production machines" using various agricultural residues as raw materials.

Management philosophy and objectives

Our management philosophy is to develop "rice husk solutions" developed from the technology to solidify rice husks inherited from our founder, add value to agricultural residues such as rice husks, and run "businesses that solve environmental and social issues" that contribute to the effective use of resources and the improvement of agricultural productivity.

Tromso's goal is to take on the challenge of new manufacturing that solves the various issues facing Japan and the world, and to contribute to the creation of a sustainable society where children in the future can live in a green and comfortable way.

Contribution to SDGs

Through the sale of rice husk solid fuel production equipment and water purifiers, Tromso will contribute to the achievement of the following six goals.

Corporate Profile

Company name	: Tromso Company Limited
Location	: 5265, Shigei-cho, Innoshima, Onomichi, Hiroshima 722-2102, Japan
Business description	: Manufacture and sale of rice husk solid fuel production equipment
Establishment date	: 15th March, 2007
Capital	: 5,000,000 JPY
President & CEO	: Masaaki Uesugi
Correspondent Banks	: Japan Finance Corporation, Hiroshima Bank, Shoko Chukin Bank, Hiroshima Credit Union

Overseas business

2013	JICA	Adopted for "Feasibility Study on Introduction of Solid Fuel Production Equipment Using Rice Husk as Raw Material" (SME Support Type) (Tanzania)
2014	JICA	Adopted for "Dissemination and Demonstration Project of Solid Fuel Production Equipment Using Rice Husk as a Raw Material" (SME Support Type) (Tanzania)
2019	Ministry of Environment	Selected for "Commissioned City-to-City Collaboration Project for the Realization of a Carbon-Society in FY1, 2019"
	TICAD7	Exhibited at TICAD7 (Yokohama)
2020	Ministry of Foreign Affairs	Through Non-Professional Grant Aid (ODA), exports of 7 grind mills to Nigeria
	UNIDO	Adopted for "Project to Support Overseas Japan Companies by Demonstration and Transfer of STePP Technology for Preventing Infectious Diseases in Developing Countries" (Vietnam)
	Ministry of Environment	Selected for "Commissioned City-to-City Collaboration Project for the Realization of a Carbon-Society in FY2, 2020 (Soc Trang Province, Vietnam)
	Ministry of Economy, Trade and Industry	The 6th Jump Out Japan! Selected for Subsidy to Support Expansion into Global Growth Markets (Madagascar)
2021	JICA	Selected for the 2nd SME and SDGs Business Support Project Feasibility Survey in 2020 (SME Support Type) (Madagascar)
	Ministry of Environment	Selected for "Commissioned City-to-City Collaboration Project for the Realization of a Carbon Society in FY3 2021" (Soc Trang Province, Vietnam)
	Ministry of Foreign Affairs of Japan	Adopted for the Decarbonization Initiative
	Ministry of Environment	Selected for COP26 JAPAN Pavilion (Glasgow, UK)
2022	TICAD8	Exhibited at the "Special Exhibition Introducing Products,Technologies, Initiatives, etc. of Japanese Companies Contributing to Africa's Development" (Tunisia)
	Ministry of Environment	Selected for "Commissioned City-to-City Collaboration Project for the Realization of a Carbon Society in FY4, 2022" (Soc Trang Province, Vietnam)
	Forestry Agency	Selected for the FY4, 2022 Forest Knowledge Utilization Promotion Project for Developing Countries (Cambodia)
	Ministry of Environment	Selected for COP26 JAPAN Pavilion (Cairo, Egypt)


Grind Mill demonstration operation in Tanzania


TICAD7 picture


Exhibitions in Vietnam


Demonstration in Cambodia

Rice husk solid fuel production equipment

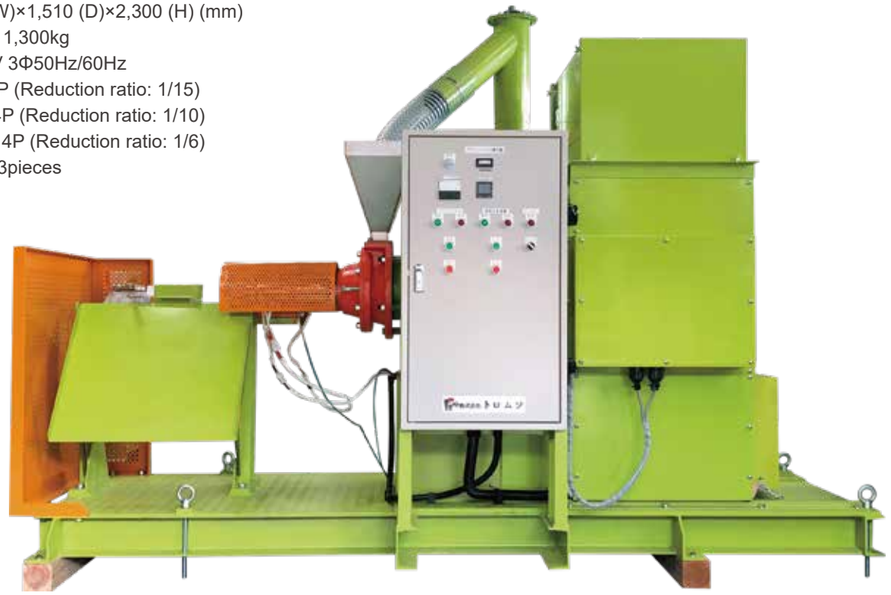
Grind Mill TRM-120F

A standard model that fully performs everything from feeding the rice husks to forming the rice husk briquettes automatically.

Suggested price: 6,600,000 JPY (excluding tax) *Rice husk spring conveyor is optional

Specifications:

Model / TRM-120F
Capacity / Approx.120kg/h (when manufacturing rice husk briquettes)
Size / 2,800 (W)×1,510 (D)×2,300 (H) (mm)
Weight / Approx. 1,300kg
Power / AC200V 3Φ50Hz/60Hz
Motor / 15kW 4P (Reduction ratio: 1/15)
0.4kW 4P (Reduction ratio: 1/10)
0.25kW 4P (Reduction ratio: 1/6)
Heater / 1.5kW×3pieces



Rice husk solid fuel production equipment

Grind Mill TRM-120DD

Economy model for overseas without the rice husk automatic feeder

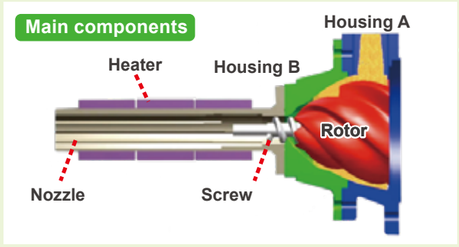
Suggested price: 5,500,000 JPY (excluding tax)

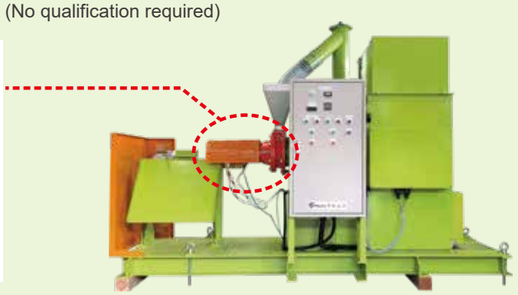
Specifications:

Model / TRM-120DD
Capacity / Approx.120kg/h (At the time of production of Rice husk briquettes)
Size / 2,700 (W)×992 (D)×1,343 (H) (mm)
Weight / Approx. 900kg
Power / AC200V 3Φ50Hz/60Hz
Motor / 15kW 4P (Reduction ratio: 1/15)
Heater / 1.5kW×3pieces

Features of the Grind Mill

- Grind Mill is an equipment that mainly produces solid fuel using rice husks as raw materials.
- Effective use of discarded rice husks and creation of added value.
- Production of rice husk briquettes with excellent combustion power. (See page 9).
- Grinding and solidifying can be done continuously in one unit, its movable to the place where rice husks are located, installed and operated.
- By removing the nozzle and heater, ground rice husks can be manufactured for the use as natural organic materials. (See page 10)
- Easy to operate and no special technology required. (No qualification required)





Two methods of use of the single unit

- Rice husk briquettes and ground rice husks can be produced by interchanging the attachments.

*More information about rice husk briquettes can be found on page 9 and about ground rice husks on page 10.

When installing
→ Rice husk briquette

When removing
→ Ground rice husks

Specialized grinding machine TRM-400S

This machine is Specialized in the production of ground rice husks.
This model is recommended for those who want to manufacture only ground rice husks.

Suggested price: 5,500,000 JPY (excluding tax)

Specifications:

Model / TRM-400S
Capacity / Approx. 400kg/h (Production volume of ground rice husks)
Size / 1,950 (W)×1,000 (D)×1,280 (H) (mm)
Weight / Approx. 850kg
Power / AC200V 3Φ50Hz/60Hz
Motor / 18.5kW 4P (Reduction ratio: 1/5)

Features of the Grind Mill TRM-400S

- Specialized model for producing ground rice husks.
  It can produce three times more ground rice husks than the TRM-120F model.
- The rotation speed of the main motor can be set freely, and the grain size of the ground rice husks can be easily adjusted.
- Recommended for those who want to mass-produce ground rice husks in a short time.

Ground rice husks

Production of ground rice husks

Specialized Curl Chip machine TRM-200CRJ

This machine is specialized in solidifying rice husks into a spiral shape.
A new grind Mill developed for overseas users looking for machines with high production capacity.

Suggested price: 5,500,000 JPY (excluding tax)

Specifications:

Model / TRM-200CRJ
Capacity / Approx. 200kg/h (Curl Chip production capacity)
Size / 2,200 (W)×1,100 (D)×1,480 (H) (mm)
Weight / Approx. 985kg
Power / AC200V 3Φ50Hz/60Hz
Motor / 30kW 4P (Reduction ratio 1/7.12)

Features of Grind Mill TRM-200CRJ / Curl Chip

- This model was developed after witnessing the current situation in developing countries where rice husks are produced in large quantities, and it succeeded in improving production capacity to meet local demand.
- By removing heaters and other equipment that were conventionally required during manufacturing and designing shorter molding nozzles, we have achieved a longer life of parts and reduced production costs.
- Curl chip are solidified rice husks of spiral shape with superior ignitability.

Solidified in a spiral

Curl Chip

Burning Curl Chip

Rocket stove TRM-2020-1-100V

A simple type of rocket stove using refractory bricks for the combustion furnace.
This is an auxiliary warming device for greenhouses that can use rice husk briquette as fuel.

Suggested price: Upon request

Specifications:

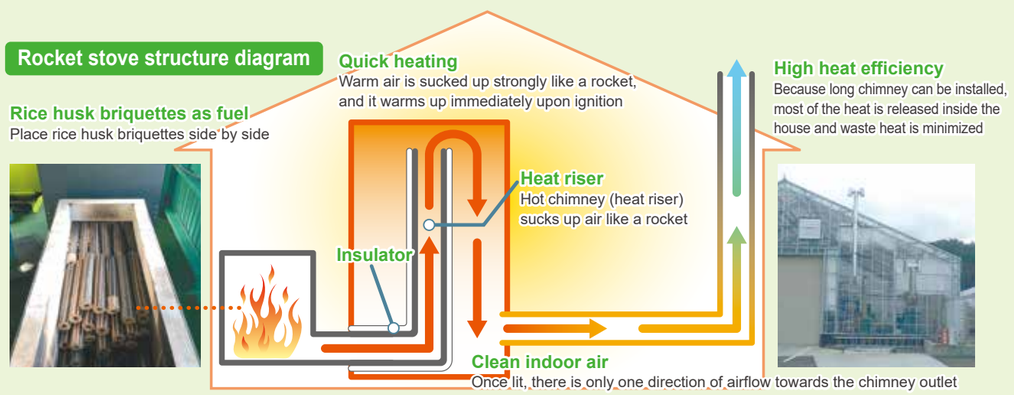
Model	/ TRM-2020-1-100V
Dimensions	/ approx. 2,150 (W) x 610 (D) x 1,350 (H) mm (Excluding chimney section)
Weight	/ Approx. 170kg
Fuel	/ Rice husk briquette (or firewood)
Injection	/ Fuel input / 100 ~ 110kg (fuel input for the above equipment dimensions)
Fuel	/ ducting, sold separately
Remarks	/ The size of the combustion furnace can be changed according to the customer's house size.

Chimney installation (maximum 20m)
By pulling the chimney horizontally,
the inside of the house can be heated efficiently.

Features of the rocket stove TRM-2020-1-100V

- The rocket stove mechanism allows the chimney to be drawn long horizontally.
- By placing the chimney horizontally, heat can be efficiently drawn into the greenhouse.
- By placing the briquettes side by side, they burn slowly and do not need to be refilled with fuel until the next morning.

Rocket stove structure diagram



Biochar Making Machine (Under Development)
TRM-300BC

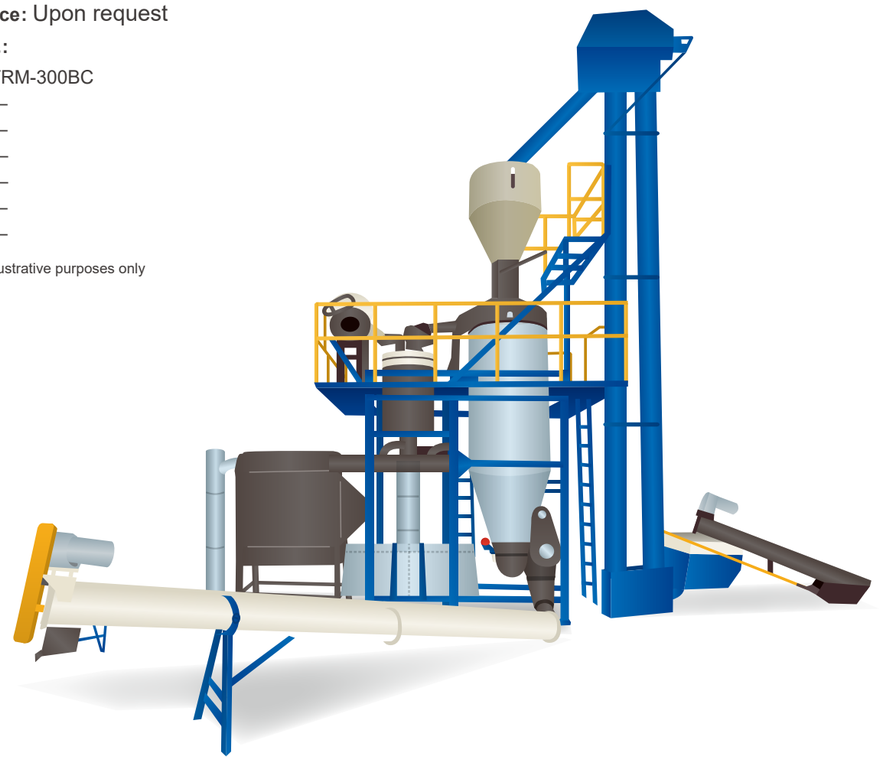
This machine is used to produce biochar for soil improvement.
The target raw material for the machine is unused agricultural residues such as rice husks, peanut shells and coffee husks (which require a certain degree of drying).

Suggested price: Upon request

Specifications:

Model	/ TRM-300BC
Size	/ —
Weight	/ —
Capacity	/ —
Injection	/ —
Heat quantity	/ —
Power	/ —

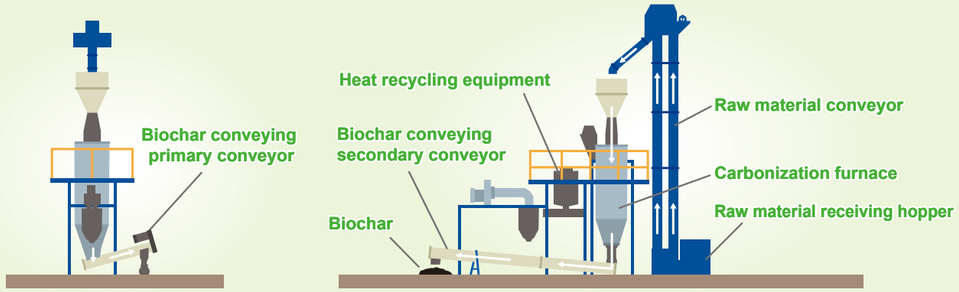
*The image is for illustrative purposes only



Features of biochar production machine

- It is possible to use the exhaust heat when manufacturing biochar and to collect the vinegar solution.
- This machine is being developed in response to technology transfer from a European (Switzerland) company. The biochar produced by this machine has received EBC (European Biochar Certificate) certification, which is the certification of biochar in Europe.

*For information about how to use biochar, please see page 11 of the biochar business



New energy derived from rice husks

Momigalite

When ground and solidified, rice husks can be made into briquettes which can be substituted for firewood. We named it "Momigalite".
Rice husk briquettes are completely natural and made of 100% rice husk.

Rice husk → Grind Mill → Rice husk briquettes (Momigalite)

Features of rice husk briquette (Momigalite)

- Easy lighting by using fire starters
- Calorific value is approximately 4,000kcal/kg
- Stable form and moisture content
- Can be used like charcoal after initial flame diminishes
- Material is rice husk which is produced every year
- Can be used long term without change to quality, suitable as an emergency fuel stock

Shape: A solid bar made by breaking the hard tissue of rice husks and compressing it
Size : Diameter 5.4cm× Length 35cm (center hole 1.7cm)
Specific gravity : about 1.2
Moisture content : about 5.5%

No binder is added during solidification

Vehicle for demonstration of rice husk briquette production

Mobile Grind Mill

Burning briquette

Questions and answers about briquettes

Q Are emissions from rice husk briquettes harmful?

A As the briquettes are made of 100% rice husks, combustion emissions are free of Sox and NOx gases. And no additional CO_2 are generated.

Q Is briquette environmentally friendly fuel?

A Although burning briquettes does in fact produce CO_2, as the rice absorbs CO_2 and emits O_2 in the process of growing, according to the methodology, the carbon dioxide emitted is not counted. Hence it is a carbon-neutral fuel.

Q Where can I buy Briquettes?

A Tromso Co., Ltd. is in charge of the secretariat of the National briquette Promotion Council. Briquettes can be purchased from this National briquettes Promotion Council website (https://momigalite.com).

National briquettes Promotion Council website

Eco-friendly new resource

Ground rice husk

When rice husks are ground with the Grind Mill, the high frictional heat kills bacteria, improves water absorption and retention, and creates an alternative medium with good air permeability.

Features of ground rice husks

- Excellent water absorption and water retention
- Ideal for livestock bedding, seedling nursery for paddy rice, horticulture, etc.

Shape: Coarsely ground rice husks
Size: Diameter 1~3mm

100% ground rice husk nursery

The use of ground rice husks reduces conventional nursery weight. And, the cost of creating a nursery is also greatly reduced.






*Use ground rice husks in nurseries at your own ris

Excellent water absorption performance of ground rice husks.

The rice husks, which are hydrophobic in nature, can be ground up and used as a bedding material with excellent absorbency.

As it composts more quickly than conventional rice husks, it is a suitable alternative to the rising cost of wood shavings.

Cherish the blessings of nature

We receive the blessing of the earth in the form of harvests, and process the by-products of these blessings, rice husk, into something that will be needed again.

It is nature's own way of following the natural cycle, similar to the food chain.

Treat rice husks as a valuable natural resource instead of a nuisance.

What is Biochar?

"Biochar" is defined as "a solid substance produced by heating biomass at a temperature of over 350°C under an oxygen concentration controlled to a level that does not burn."

*Based on IPCC guidelines reviewed in 2019

The raw material for biochar includes various organic residues (biomass), including wood, bamboo, rice husks, and livestock excrement. In recent years, biochar has been attracting attention not only as a soil improvement effect in the application of farmland but also as a measure to prevent global warming (carbon storage), and biochar is an agricultural material that can contribute to solving various environmental problems such as the treatment of organic residues generated by farming and the reduction of greenhouse gas emissions.

Application of biochar

Application of PLA

Features of biochar

- Improvement of water retention in soil
- Ph adjustment
- Reduction of greenhouse gas emissions
- Improvement of fertilizer utilization efficiency
- Carbon sequestration
- Reduction of soil contamination
- Increase in soil organic carbon, etc.

Differences in growth due to biochar

Case Study 1

Experimental description:
Biochar agricultural application experiment.

Country of operation:
Zirobwe, Luwero District, Republic of Uganda.

In this experiment, Professor Nishihara of the Faculty of Agriculture, Tottori University, demonstrated cultivation using biochar.
Biochar made from rice husks, an agricultural residue generated in the region, was applied to maize cultivation fields. Compared with previous results, the following were achieved: (1) an increase in yield of approximately 20%; and (2) chemical fertilizer input reduced to half.

District for the practice

500g/m2 biochar application

250g/m2 biochar application
+ 1/2 chemical fertilizer

500g/m2 biochar application
+ 1/2 chemical fertilizer

Case Study 2

Experimental description:
Biochar farming application experiment.

Country of operation:
Ninh Thuan Province, Vietnam.

The experiment has been conducted continuously since October 2022 in collaboration with Professor Nishihara of the Faculty of Agriculture, Tottori University, with the support of Hiroshima Prefecture. For melon, cauliflower, and okra fields, bio char made from rice husks was applied. At present (as of April 2023), we are monitoring and conducting experiments based on various conditions such as yield, harvest quality, soil condition, and disease incidence.

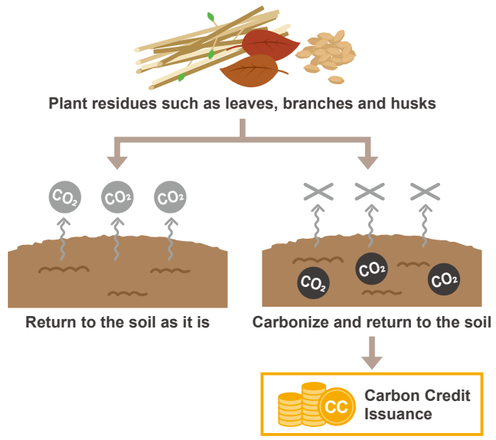
Cauliflower field with biochar applied

Growing

Harvested cauliflower

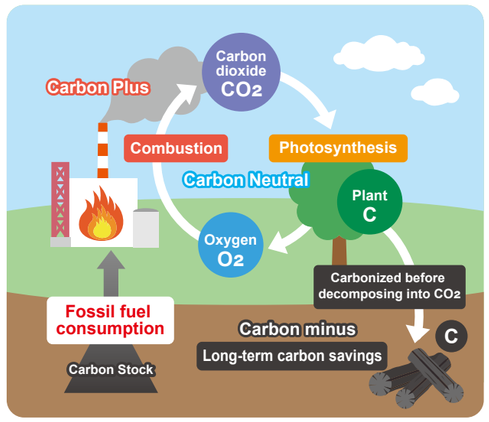
Carbon Credit System

Carbon credits are a mechanism that makes it possible for companies to trade the amount of (GHGs) emission reductions, including CO_2. There are domestic and international markets where GHG emission reductions can be traded, and the market is expanding as investors, non-governmental organizations (NGOs) and consumers become more aware of decarbonization. There are two types of credits: government-led credits and voluntary credits issued by private-sector-led projects such as NGOs, companies, organizations, and individuals.



Mechanism of CO_2 fixation in biochar

Carbon contained in wood, bamboo, etc., which are the raw materials for biochar, is decomposed by the activity of microorganisms in the soil and released into the atmosphere as CO_2, but by applying it to the soil as biochar, it is possible to reduce CO_2 released into the atmosphere by hindering the decomposition of the contained carbon and trapping it in the soil (carbon storage).
For example, when 1 ton of biochar made from rice husks is applied to farmland, a reduction effect of about 1.16 t-CO_2 is expected.



Future Tromso's Efforts in the Trend of Green Food System Strategy

The Ministry of Agriculture, Forestry and Fisheries (MAFF) has formulated the "Green Food System Strategy" to achieve both productivity improvement and sustainability in the food, agriculture, forestry and fisheries industries through innovation.

Vision by 2050

- ☑ Zero CO_2 emissions in agriculture, forestry and fisheries
- ☑ 50% reduction in the use of chemical pesticides (risk equivalent)
- ☑ 30% reduction in chemical fertilizer usage
- ☑ Increase the ratio of organic farming area to 25% (1 million ha)

Tromso's activities regarding the above objectives

By utilizing various agricultural residues generated around the world as a valuable agricultural material called biochar, we aim to contribute to solving social and environmental issues and develop sustainable agriculture.

Welvina
Rice Husk activated carbon filter

Tromso Water Purifier "Welvina" Japan quality filter made from Japanese rice husks

Water has a very close relationship with our lives. As well as drinking water, water comes into direct contact with our skin, for example, when we bathe or wash our face. Water enters our mouths indirectly through the food we use for cooking and the dishes we wash. In addition to chlorine added at water purification plants, some impurities can also be mixed in with the water as it passes through the water pipes before it is used in each household. However, these impurities can also be removed by using a water filter made of rice husk activated carbon. Because water is taken into the body in various forms, we want it to be of the best possible quality.

As much as 100 million tons of rice husks are generated on the earth every year.
Carbonized rice husk briquettes are used as an activated carbon filter in water purifiers.
Rice husks contain a large amount of silica (Silicon), which is also contained in rice husk activated carbon filters. There are two types of silica: insoluble silica and water-soluble silica. Silica is a mineral necessary for moisturizing the skin and regenerating and maintaining collagen.
Silica is found in the soil and is absorbed by rice plants, including rice husks. By using rice husk activated carbon filters, it is absorbed by our bodies in the form of silica dioxide.
It has also been found out that silica derived from rice husks is particularly well absorbed by the body.

**The most common type of filter found in water purifiers uses coconut shell activated carbon.
However, Tromso’s water purifier use rice husk activated carbon, which is made from Japanese rice husks**

Welvina series product lineup

Pitcher type
Suggested price: 6,500 yen (excluding tax)

The simple and compact shape can easily fit in the door pocket of a refrigerator.
A stopper between the lid and the inner container prevents the mixing of raw and purified water.
The bottom half of the main body is indented to make it easy to hold with one hand.
As it can be kept in the refrigerator at any time, it is useful during the season when drinking water is used frequently such as summer.

*It can be placed upright on a shelf with a height of 25 cm or more

Outdoor stationary model (PoE type)
Suggested selling price: 228,000 yen (excluding tax)

It is an outdoor water purifier that can filter all the tap water in the house. You can use Welvina's safe and delicious water in all situations, including drinking water, water that touches the skin such as bath and showers, and laundry.
In addition, since it does not use a power supply, it can be used even in the event of a power outage in the event of a disaster.

*The outdoor Welvina is a product jointly developed by "DAX Co., Ltd." and "Tromso Co., Ltd."

Water server type (with cold and hot water function)

In conventional water server type water purifiers, customized filters are installed according to each function and often consist of multiple filters.
Welvina high-performance water purification filter (TRM-03B) consolidates each filter that are usually divided by role, into a small number so that you can enjoy delicious silica water smartly and easily.

High-performance
water purification filter
TRM-03B

Thoughts behind Welvina

Welvina is derived from the words “Wellness”, “gain”, beauty and “natural”.
The meaning is to obtain health and beauty through the power of nature.
Silica, which is essential for health and beauty, tends to decrease with age and cannot be produced by the body.
Welvina can easily make silica water from your faucet, so you can easily add silica to your daily drinking water.
Welvina silica water will support your health and beauty.