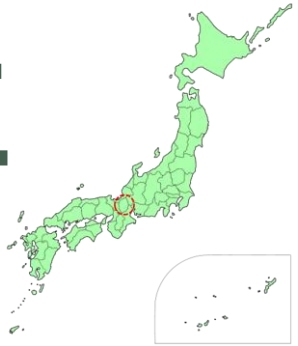
Pioneer of rice husk utilization technology
for Sustainable agriculture and environmental protection

関西産業株式会社
KANSAI CORPORATION



本社　Headquarter

技術センター　Technical Center

Automatic Rice-Husk Carbonizer (ARC)
自動籾殻炭化装置（連続式）

KANSAI

What is the Automatic Rice-husk Carbonizer(ARC)?

Since 1941, we developed many tools for effective usage of rice-husk and completed this ARC in1967 for the first time in the world. More than 400 units are already introduced in Japan, Cambodia, Myanmar and the Philippines. And cover more than 90% of the market in Japan by incessant efforts of improvement until now.

炭化装置の特徴

Four major features of ARC

① Continuous carbonization system

Automatically supplied into the ARC continuously, the rice-husk turns into the regular charcoal within 10 min.

自動・連続炭化

② Environmentally friendly

No black smoke, tar and nasty smells at the operation are produced, as the combustion gas is completely-burned in the chamber.
At starting, 1~4ℓ kerosene is necessary. But no need to use it. After that. Because of the self-sustaining combustion of the husk.

煙・有害ガスが出ない
着火時以外燃料を使わない

③ High durability

The durability of the furnace composed from refractory brick will continue more than 30 years when maintained properly.

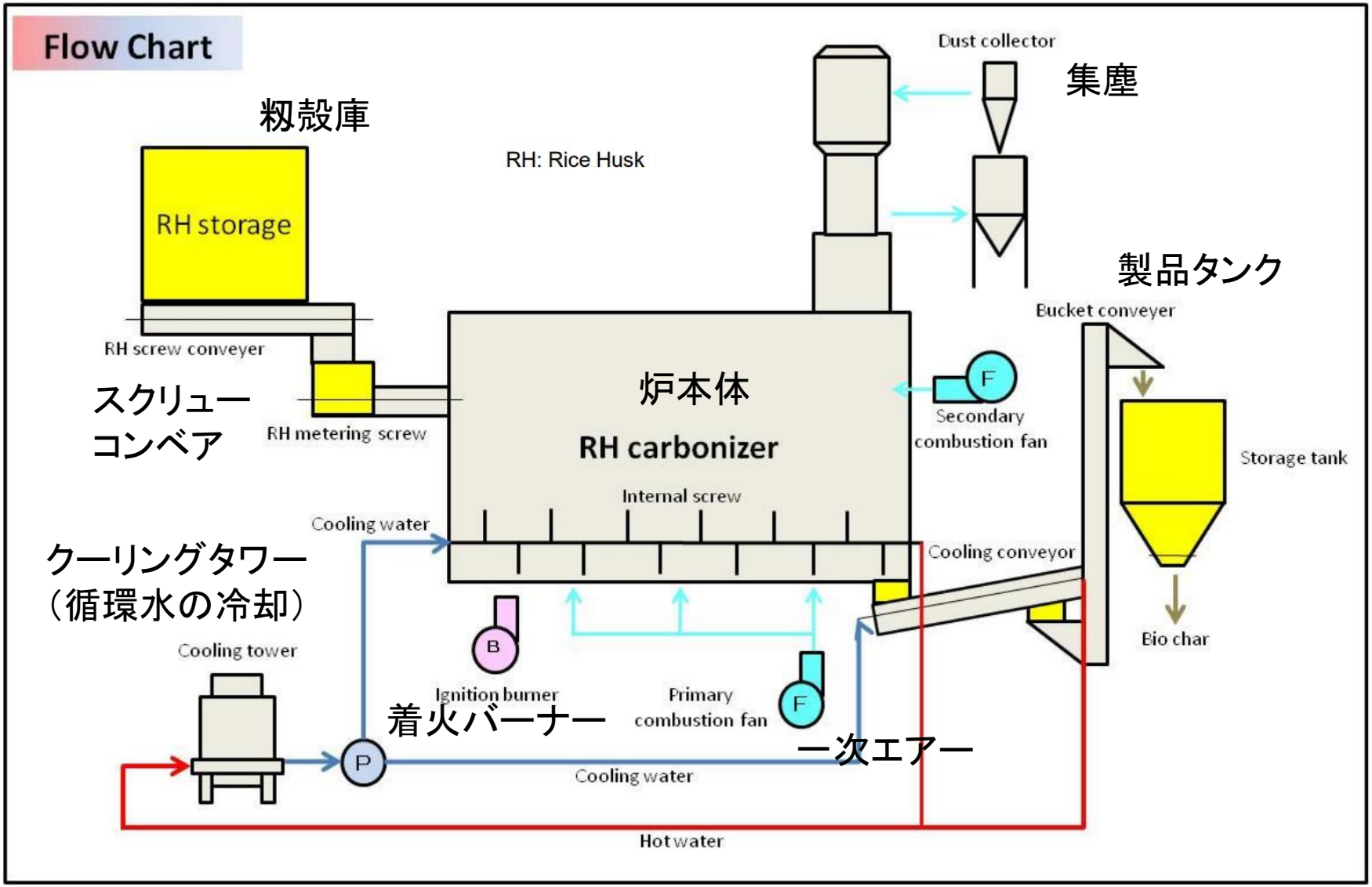
頑丈で高耐久性
（30年以上の稼働実績）

④Easy operation

The charcoals yielded is stocked automatically in the storage tank.
And measured and baled after cooling (baler is option).

容易なオペレーション
機械操作と袋詰めのみ

装置フロー Machine Flow



装置仕様 Machine Specification

Item 項目 / Type 型式	能力 Capacity		使用動力(kw) Power Required	所要水量(L/min) Water Required	
	Kg/h	俵/h		炉内コンベアー	消火装置
ＬＭ－２００型	200	13	8.6	30	20
ＬＭ－６００型	600	40	12.3	30	20
ＬＭ－９００型	900	60	13.0	30	20
ＬＭ－１２００型	1200	80	19.55	50	30

○能力は籾殻重量（kg）と玄米基準の俵数で表示しております。玄米１俵（６０kg)に対して約１５kgの籾殻が発生します。
○籾殻は乾燥された状態で水分１５%以下、籾殻庫に保管されたものをご使用ください。また本装置は籾殻専用であり、
　原則他の原料は炭化できません（原料によっては対応可能な場合もありますので、弊社までご相談ください）。
○建屋、基礎、給排水配管、電気工事、換気扇、揚水ポンプ等は別途費用となります。
○冷却水設備に関しては、地下水が使用できない場合は水道水の循環方式を採用します。所要水量は１/２０以下となります。
○本仕様は予告なく変更する場合がございます。予めご了承ください。
○実際の運転に当たっては、取扱説明書をよくお読みいただき、弊社指導員の指示のうえ、行ってください。
○上記能力以外の炭化装置もご要望により、設計いたします。

●Main specification

Type	LM-900
Performance	900kg/h (Rice husk)
Capacity	220kg/h (charcoal)
Size	12,000(W)×7,000(L)×8,000(H) ㎜
Dry weight	16t
Power	13kW
Cooling Water	50ℓ/min (※)
Option	Automatic bag-filling machine (baler)

(※) without recover

It is possible to recover the heat radiation.

バイオ炭の効果 Effect of Bio-char

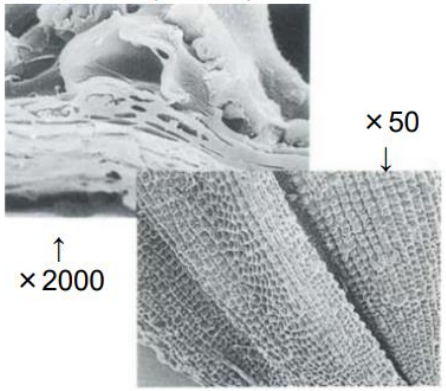
多孔質性　⇒　通気性、保水性･透水性
ケイ酸質の補給
色が黒い　⇒　地温の上昇
比重が軽く土の軽量化

Characteristic and application of Bio-char

4 factors are necessary for a plant to grow.
Those are water, air, the sun and soil.

Effect ①

Countless of micro-holes about 20 - 40μm are inherent in the Bio-char. And have effects of permeability (air), water conservation (water), hygroscopicity (water), adsorption (water).



Effect ②

The main component of ARC is silica (SiO_2) and it strengthen roots and stems of siliceous plant like rice(soil). And heat retention effect of the soil when plowing into soil (sun). Because it is black color.

Effect ③

The specific gravity of ARC is so light as 0.1g/cm^3.
When fertilize ARC on the hard clay soil, soil changes softy and in case of the sandy soil, it turns into harder soil (soil).

Application of Bio-char
バイオ炭の用途

1. 培土混合

Cultivated soil mixture

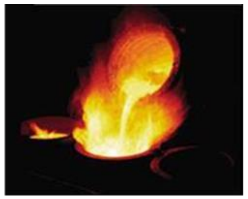
2. 土壌改良資材

（政令指定）

Land improvement materials

3. ホームセンター販売

Sales at home improvement store



4. 工業利用（製鉄用保温剤）

Industrial use

5. 融雪剤

Snow melting agent

6. 床下調湿材

Underfloor temperature control material

Application for soybean

The soybean, which requires much nitrogen for nitrogen fixation as shown on following photo, can increase the yield when fertilize ARC, because much root nodule bacteria (Rhizobium) increase and supply sufficient nitrogen to soybean.

Application for nursery

Mix the Bio-char on marketing nursery soil by 30 - 50 % by volume, roots will extend strongly and save growing cost remarkably.

Application for seedling

Soil preparation for vegetables glowing such as tomato, eggplant, cucumber, spinach, watermelon, strawberry, tobacco, and many kinds of flowers, will become easier and bring about revenue increase.

籾殻燃料化 Fire Husk

< Description of Technology >

Rice Husk Briquettes Production Equipment compresses the rice husk volume to about one tenth and process it into rod-shaped briquettes so that they can be easily stored and transported.
[Facility, Device or Equipment]

Rice Husk Briquettes

製品名	籾殻圧縮成形機
型式	FHM-120 型
加工能力	120kg/h（最大）
製品寸法	幅 1,050mm × 奥行 2,465 mm × 高さ 2,050 mm
電源電圧	AC200V 50/60Hz
消費電力	19.9 kW
安全装置	過負荷防止装置

< Technology Advantages >

1. Compressed to one tenth in volume

The Fire Husk Machine compresses the rice husk volume to about one tenth and process it into rod-shaped briquettes, which is storable and portable clean energy.

2. High Calorific Energy

The heat quantity of rice husks is as large as 3,800 kcal/kg, and the solid fuel made of rice husks can be used as a replacement of firewood. With long combustion time, the produced briquettes can be sold for many applications as fuel.

3. Valuable by-product

Ashes after combustion contain a large amount of silica and can be used as agricultural materials.

< Technology Specification >

FHM-120 Type

Rice husk processing capacity: 120 kg/h

Power required: 27.0 kw

KANSAIはもみがらの地域循環モデルの創造に取り組んでいます！

籾殻燃料化 Fire Husk

< Intellectual Property >
Japan

< Certification and Testimonial by the Third Parties >
2010: Medal of honor, Dark blue ribbon medal
2009: Medal of honor, Yellow ribbon medal
2008: Award for distinguished service from Japan Institute of Invention and Innovation
* Described for the past three years, and many others since 1968.

< Collaboration Partners >
Mie University, Osaka University, Kyoto University, The University of Shiga Prefecture

< Environmental Aspects >
Carbon neutral, carbon offset and CO_2 reduction through the production of rice husk briquettes

< Project Records >
[Japan]
Agricultural cooperatives in various regions
Agricultural corporation
Toyama prefectural university
[Myanmar]
2010: Introduced the rice husk briquette equipment and rice husk-based heater (NEDO demonstration and verification project)
*More Projects records in the Philippines, Vietnam and Cambodia with other technology of KANSAI CORPORATION

数々の受賞歴・共同研究実績
海外での事業展開

Awards and Joint researches
Overseas business development

Awards 受賞歴

１９６８　社団法人発明協会より　特賞
１９７４　社団法人発明協会より　発明奨励賞
　　社団法人発明協会より　功労賞
１９７５　科学技術庁長官賞　受賞
１９７９　財団法人クリーンジャパンセンター
　　再資源化貢献企業　会長賞
１９８２　社団法人発明協会より　発明奨励賞
１９８５　科学技術庁長官賞　受賞
１９８６　黄綬褒章　（故会長）
１９８８　社団法人発明協会より　中小企業庁長官奨励賞
　　社団法人発明協会より　発明実施功績賞
　　社団法人発明協会滋賀県支部より
　　発明くふう展発明奨励賞
１９８９　社団法人発明協会より　中小企業庁長官奨励賞
　　社団法人発明協会より　発明実施功績賞



社団法人発明協会より　特賞


通商産業大臣賞


黄綬褒章（故 初代会長）

１９９０　通商産業大臣表彰　工業所有権制度関係
１９９１　社団法人発明協会より　発明奨励功労賞
　　紺綬褒章　（故会長）
１９９２　勲五等双光旭日章
２０００　社団法人発明協会より　近畿通商産業局長賞
２００４　文部科学大臣賞　受賞
２００８　社団法人発明協会より　奨励功労賞
２００９　黄綬褒章
２０１０　紺綬褒章


黄綬褒章

籾殻燃料化 Fire Husk

< Business Model >

Sales of technology and equipment, Production

Producing rice husk briquettes as a replacement of firewood and as a heat source for power generation plants promoting in Myanmar, Laos and Cambodia, as KANSAI CORPORATION is promoting in Myanmar, Laos and Cambodia.

< Customer Segment >

Project Developers, Manufacturers, Research institutes, Agricultural cooperative society, Rice polishing facilities

< Preferred Business Location >

Japan, Southeast Asian countries (Philippines, Cambodia, Myanmar, Vietnam and Thailand), Countries and regions with high rice production

< Way to provide Technology >

Sales at a fixed price, Joint Venture or Shareholding, Profit Sharing