

Case studies of Advanced Construction and Demolition waste(CDW) Recycling initiatives and technologies In JAPAN

Affiliation	KAMEI SEITO Co.Ltd.	
Location	1258 Kasahara-cho Tajimi-shi Gifu, Japan	
Position:	President	
Name/Surname	Hiroaki Kamei	
e-mail	h-kamei@eco-angels.com	
Title	Non-fired eco bricks	
Theme classification	<input type="checkbox"/>	Prevention
	<input type="checkbox"/>	Re-use
	<input type="radio"/>	Recycle
	<input type="checkbox"/>	Reduce Co2
	<input type="checkbox"/>	Legacy
	<input type="checkbox"/>	Business to overseas
	<input type="checkbox"/>	Etc.
Technology development stage	<input type="radio"/>	Practical use
	<input type="checkbox"/>	Scheduled to be put into practical use by 2020
	<input type="checkbox"/>	Scheduled to be put into practical use after 2020
Specific content	<p>- Non-fired eco bricks are utilized, Sewer sludge, burned ash, coal ash, ceramics abolishedsoil [Kira], molten slag, glass waste and many otherunused resources and are regenerated to form a revolutionary brick style block, without baking, using our special slodificaton technology (Patentprocess).</p>	
Appeal point	<p>- Non-fired eco bricks has a texture of pottery and abundant color, yet it is non-baked, realizing low price and good workability.</p> <p>- In addition, it meets strict criteria for safety such as strength slip resistance, elution of harmful substances and can be used with confidence.</p> <p>- A newly developed Eco brick, friendly to the earth, which does not burn fossil fuels that cause global warming at least 80% of the recycled material ratio, Non-fired eco bricks is a product born of the demands of the era.</p>	



We develop eco products for global environment.



We reuse every by-product as raw materials and ecreate them into superior scene materials and functioning materials, this is our contribution to society.

We always strive to acheive the next step in keeping the enviroment "as it is" for the future.

Eco Products for Landscape and Garden

Earthen Techno



KAMEI SEITO Co.Ltd.

www.eco-angels.com

"E" is a keyword in the recycling society



"E's" motto is, "To produce a product Desirable For everyone; customers, manufacturers, discharge producers and the Earth.

Earth, Ecology, Environment, Education, Energy, Economy etc. - in the recycling society, where Nature and humans coexist, the keywords start with "E".

Across the field and in various situations, places and scenes, it is "E's" idea to build a network which links these "E's" organically, and to aim for a recycling society.

"E's" philosophy is to cherish to produce the product comfortably, not only for the sake of the development of the company, but also for the population and the Earth.

The commitment of using the Non-Firing Solidification Technology

無焼成・無排水・無廃棄



We have special patent technology called "[the Non-Firing Solidification Technology](#)".

This is a reclaiming technology, [using various kinds of waste, to produce clean bricks](#) and roadbed materials without baking. This is a low environmental impact recycling technology, that is carried out in seven plants within Japan.

On the other hand, in other Asian regions - China and India in particular, large economic growth is occurring, which is producing mass quantities of air pollution and waste that is difficult to manage.

The brick production volume in these areas constitutes approximately 80% of the world's total volume. Brick production creates large amounts of CO₂ waste, which is a significant factor in global warming, barren land issues and desertification.

The Non-Firing Solidification technology for producing bricks is an ideal form of recycling - with regards to resource protection, waste becomes the raw material of the brick, and to contribute towards the prevention of global warming, the product is not baked.

Now, we wrestle with many national businesses and are aiming to take "E" to "Global E".

Company profile

Earthen Techno (地球技術) 亀井製陶株式会社

Company name	Kamei Seito Co.,Ltd
Mission	「無焼成固化」技術で地球環境保全に貢献します。
Address	1258 Kasahara-cho Tajimi-shi Gifu, Japan TEL0081-572-43-3511 FAX0081-572-43-6815
Established	1/1/1966
Capital	40,000,000yen
Business contents	<ul style="list-style-type: none"> ● Production and wholesale of "Earthen Bricks" ● Collection of industrial waste transportation / intermediate processing(Recycling) ● import and sale building stones, Sue board, gardening materials and others ● Global development of the non-firing solidification technology
Employees	5
Bank	Japan Finance Corporation for Small and Medium Enterprise / Tono Shinkin Bank / Ogaki Kyoritsu Bank / The Bank of Tokyo-Mitsubishi UFJ,Ltd. / 16 Bank and Others
President	Hiroaki Kamei
Collaborative relationship	<ul style="list-style-type: none"> ・Tokyo Electric Power Company ・Marubeni Corporation ・Takahama Industry Co., Ltd. ・Nagoya Institute of Technology ・Alced Co. ・Tepia Co. ・Eco Business Network and Others



Although they are non-fired, they are very safe, high quality and low price.



Sewer sludge, burned ash, coal ash, ceramics abolished soil [Kira], molten slag, glass waste and many other unused resources are utilized, and are regenerated to form a revolutionary brick style block, without baking, using our [special solidification technology \(Patent process\)](#).

We feel it is important to create materials of soft disposition, that feel like ceramics, which gives warmth and serenity to the cityscape.

Feature

◆ resource conservation

[80% of the raw materials are made up from several kinds of by-products from other industries](#), which result in absolute zero emissions. It is possible to produce strong, stable, durable bricks of long term quality by utilizing the best mix of raw materials with their own individual qualities.



Gifu-ken waste recycling recognition product

◆ Circulation type

We reuse the inferior goods which come out of the manufacturing process as raw materials, and also, because of the non-firing technology, no CO₂ or factory draining waste is created. Furthermore, the products can be reclaimed as many times as possible after use.



Eco mark executive office recognition, environmental preservation commodity

◆ Energy conservation

Scrap materials without pretreatment can be used for raw materials, even without

firing. Due to the fact that the fossil fuel is not burnt, excessive processes are excluded, so the production is energy-saving and cost-saving.

◆ **Safety**

From the acceptance stage of the raw materials, of course to the finished product, the process conforms to strict physical properties standards and environmental standards. Furthermore, we execute the original released metal content test with Ph3, which is above and beyond the safety standards.

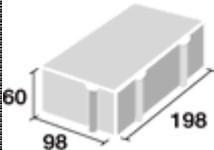
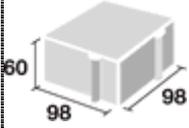
◆ **Scenery characteristics**

The product looks a little like antique bricks, due to the ceramic kneading technology that is applied, and they will continue to mature attractively over the coming years of use.

◆ **Consideration type**

It is suitable for non slippy, comfortable, barrier free sidewalks. Furthermore, in order to produce good effects on vegetation and the living environment, special EM ceramics have been added to the raw materials.

Specification

Form		
Use quantity (bricks/m²)	50 bricks/m ² (100x200)	100 bricks/m ² (100x100)
Pallet loadage (bricks)	600 bricks/pt.	1200 bricks/pt.
Weight	Scratch(100x200) 2.3kg/brick	Scratch(100x100) 1.1kg/brick
	Scratch Cobolu (100x200 with round corner) 2.2kg/brick	Scratch Cobolu (100x100 with round coerner) 1.0kg/brick

We also produce different types of 50mm thick, without the lip.

Standard operation cross section diagram



Safety data

Item	result	metrical method
Released metal content test	conformity	18th environmental economical notification
Content test	conformity	19th environmental economical notification

Physical properties data

Item	physical properties	standard level	examination method
Flexural strength (Mpa)	8.2	5.0 or more	The interlocking block association method
Compressive strength (N/mm ²)	62.0	32 or more	Basis of JIS R 1250
Resistance abrasiveness (g)	0.098		Standard of JIS A 5209
Damp slide value of resistance (BPN)	76.3	40 or more	ASTM E-303
Frost damage resistance characteristic	No abnormality		Basis of JIS A 5209
Coefficient of permeability (permeability type)	3.732*10 ² cm/sec	1*10 ² cm/sec or more	Basis of JIS A 1218



The non-fired eco bricks which are produced from industrial waste

Our non-fired eco brick is produced by materials made from industrial waste. To regenerate various kinds of industrial waste to a brick-like block by "non-firing", "no disposal", "no drainage" production, which are the low-environmental-load, recycled bricks.

Materials for non-fired eco bricks

◆ City rubbish melted slug (general waste incineration melted slug)

Incinerates general home "burned rubbish" to stabilize (shut in) the harmful matter, which is melted at high temperature (melting) to vitrified slug (sandly).

◆ Sewer sludge ash (feces, urine and other careless drainage waste ash)

There are two types of sewage which are the branch system and the confluence system. The branch system is the waste water, feces and urine from homes, and the confluence system is when the branch system waste and the rainwater that fell in the urban district flow together. The sludge ash is the sludge, after microbe processing, and incinerated to reduce capacity to minute powdered ash.

◆ Waterworks sludge

beverage service water purification remaining earth

◆ Coal ash < fly ash: FA >

coal thermal power burned ash

◆ Glass cullet (pulverized glass, such as glass packing container)

Among the glass bottles which are disposed of, mainly from general homes, is glass which cannot be recycled < shattered bottles of import wine and bottles of cosmetics, are examples > these are ground into sand consistency (the cullet).

◆ Paper sludge ash <PS ash > (waste paper, recycling by-product ash)

During the processing of waste paper to make the recycled paper, the old ink and clay

which is contained in the paper, is discharged as sludge. After chemical treatment, the capacity is decreased by incineration to minute powdered ash.

◆ **Minute silica sand < [kira] > (glass ceramics raw materials extraction process by-product)**

The powdered sand which remains after extracting, from the minerals, the silica sand which become the raw material of glass and clay which make ceramics (the mountain soil which becomes the raw materials)

◆ **Quarrying waste soil (remaining soil after extraction of gravel)**

It is discharged in the extraction of mountain gravel and mountain sand. There are two manufacturing methods that discharge them, which are the wet process and the dry process. The wet process is the main discharger of waste. The the gravel and sand is washed and put through the filter press (the dehydrator) to eliminate clay sludge. (The stone dust which is discharged during the dry process can also be used)

◆ **Cupola slug (metal industrial waste)**

This is the slug which is discharged from automobil parts factories. The slug is discharged by using the blast furnace, which is called the cupola, to discharge the pig iron (dissolved iron), which is melted with high temperatures to a mud condition that is removed directly in water, becoming sand condition.

◆ **Foundry sand or Cast-metal sand(metal industrial waste)**

This is the fine sand which is used in order to form cast-metal.

◆ **Dam, lake and pond bottom mud (accumulation sludge)**

This is the sludge which has sunk to the bottom of dams, lakes and ponds, containing the organic matter. Its state varies, depending on the surrounding environment.

◆ **Waste gypsum (pulverized gypsum board)**

This is formed when gypsum board from constructive scrap is pulverized to white powder, to remove paper and rubber, etc and extract gypsum.

◆ **House manufacturer external wall material rubbish (cement type pulverization or sludge)**

This is the waste produced when major residential manufacturers pulverize the external wall and edge materials from the demolition of the original residence, in order reuse materials of cement type etc.

◆ **Bentonite mud (civil engineering works scrap material)**

This is the used mud of sealed construction and post construction bentonite (clay).

◆ **Volcanic ash**

volcanic ash such as Mt. Usu and Fugen peak

◆ **Used perlite**

Incinerating perlite, which is used as an absorbant, converts it to inorganic and makes it minute powder.

◆ **The slaked lime sludge**

The slaked lime sludge which occurs at the time of carbide production.

◆ **Rock wool (silica calcium) waste**

The waste of rock wool heat insulator used in furnace walls

◆ **Plastic waste, FRP pulverization**

◆ **Construction site outbreak remaining soil**

The remaining soil which occurs during construction works and civil engineering works

◆ **Others**

In addition, cinder, burning shell, inorganic characteristic sludge, dust, ore occasion, glass ceramic ware rubbish, plastic waste



Our products can be purchased in Eco-Angels stores. In addition, [please do not hesitate to contact us](#) if you have any further questions.

Original Products

Garden bricks Eco-product



Sewer grime destruction by fire ash, coal ash, ceramics abolished soil " Kira ", molten slag, glass waste and many other unused resources are utilized, and are regenerated to form a revolutionary brick style block, without baking, using our special slodificaton technology (Patent process).

Washed gravel, makeup gravel, paving gravel Eco-product



Ceramic raw materials are a by-product of washed gravel, makeup gravel and paving gravel which are necessities in gardening products in order to enjoy a variety of colors and to strengthen the groundwork of garden soil.

Weed prevention products / The prevention of weeds



Are you having a problem with weeds that grow with out limitation? The simple execution of "Grass Feud" can confine weeds with a compressed strength of more than 12N/mm², while there is permeability.

Imported products

Flat board / Sue board



These are gardening quotient materials that can be easily used to the accent the garden, the driveway, or the entrance. Please coordinate color and design preference to an image of the garden.

The garden paving stone



The building stone series of granite (domestic production) comes in a variety of sizes and two basic colors - white and rust. They are of superior durability and create a grand atmosphere.

Gardening exterior



The gardening exterior plays an active part in the finishing touches and accent of the garden. There are numerous exterior goods which would fit for the entrance, driveway, garden and others.

Buffer stop/ Bumper/ (Parking block)



The parking block is used widely in parking lots in public spaces, such as parks and hospitals. They are sturdy and durable and installation is simple