



January 20<sup>th</sup>, 2009

To whom it may concern,

Kawaguchi Steel Industry Co., Ltd.

Super lightweight, thin-film solar photovoltaic system for industrial/public use  
-Enables solar panel installation on rooftops of gymnasiums-

**1. Our solar panels can be attached to facilities with load limits such as warehouses/factories.**

By fully utilizing our know-how gained through buildings' rooftop construction work, we developed and began to sell a lightweight photovoltaic system that allows to attach solar panels on facilities that lack enough strength such as factories, warehouses, public buildings, schools, gymnasiums or shopping centers.

**2. Attachment without reinforcement or mounting.**

This photovoltaic system makes solar batteries attachable on structurally-complex rooftop or curved surface of public buildings/school gymnasiums without additional strengthening or conventional setup mount.

**3. Film-form amorphous solar battery with plastic film platform is used.**

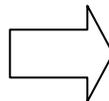
**Amorphous solar battery can generate sufficient power even when attached horizontal.**

Module unit is only 1mm thick (film; 0.1mm/ solar battery; 0.1mm/ fluorine steel plate; 0.8mm), weigh one seventh compared to the conventional solar battery with glass platform. Thus minimize the weight bearing on buildings and enables area expansion. We process this module with our original crafting method to fit various rooftops and exterior walls.

Thin-film form has brought greater flexibility to the photovoltaic system, even attachable on rounded surface, to match differing situations and uses on each rooftop/exterior in the best way.



<Module unit>



<all-in-one panel module; 525 × 3881mm>

This system can be installed to long, folded-plate/wavy slate rooftop materials widely used on existing factories or warehouses. We developed lightweight specialized metal fittings to attach the all-in-one solar panel, film form amorphous cell glued to steel plate, without making screw holes on the rooftop.





<Image of all-in-one panel solar cell attached on long folded-plate/undulate slate roof material>



#### 4. Procedure without leaving screw holes on slate of roof.

- Before, when setting up solar cells on wavy slate rooftop, the form widely seen on many existing warehouses, contained asbestos or the weights were hampering the process. However, our original cover-roof construction method enables to overcome these difficulties. (No need to make holes on the slate roof.)
- When solar battery attached on the slate roof, the heat insulation effect is 2-5 degrees Celsius.



## 5. Future development plan

- ① Develop photovoltaic system attachable on more design-oriented private households' roof materials/exteriors by using orbicular silicones.
- ② Also using orbicular silicones, integrate solar cell module with roof/wall materials by directly evaporating modules to long, folded-plate roof materials.
- ③ Establish so called "rooftop lease model" to mitigate the owner company's financial burden of capital investment when setting up photovoltaic system on industrial buildings.
- ④ Build up "energy town model"-while developing housing land, establish a complex energy town able to generate megawatt power energy, consisting of around 100 private houses.

### <Solar battery specifications>

	Film form	All-in-one panel form
inner module hookup	in-line4, multiple 2	in-line4, multiple 2
nominal maximum output power[W]	92	86.4
nominal maximum output voltage[V]	319.4	306.4
nominal maximum output power source[A]	0.288	0.282
nominal open voltage[V]	429	428
nominal short-circuit current[A]	0.390	0.388
maximum system voltage[V]	1000	600
measurement[mm]	460 × 3399	525 × 3881
thickness[mm]	1	2
weight[kg]	1.57	14.9

### <For any questions relating to this matter, please contact below>

Kawaguchi Steel Industry Co., Ltd. Attn. Kawaguchi

760-6 Hara-cho, Tosu city, Saga prefecture, Japan

e-mail : [chopper@steel-k.com](mailto:chopper@steel-k.com)

TEL : +81-942-83-6331 (weekdays 9:00 to 18:00)

FAX : +81-942-85-2612

### <Company outline>

Company name : Kawaguchi Steel Industry Co., Ltd.

Capital : 281,500,000 yen (reserve fund included)

Headquarters : 760-6 Hara-cho, Tosu city, Saga prefecture, Japan

Foundation : 1930

Registration : August 2<sup>nd</sup>, 1993

URL : <http://www.steel-k.com/>

Main activity : Sales and execution of solar power generation system/ sheet-metal work on buildings/ metal work/ roof and external wall work