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ECO - Friendly Photovoltaic RIBBON

Produced by KOS, the global leader in stainless steel wire





Greetings!

KOS continues to advance in the photovoltaic market with its PV ribbon.

Greetings to all companies involved with solar energy, an answer to a bright future. We are proud to mention that as a leader in the stainless steel industry with exceptional techniques and high tech facilities, our PV Ribbon venture which started in 2007 us now world wide renowned.

As we are sure aware, KOS is partaking in three national government programs with S-Energy, Hyundai Heavy Industry and finally Samsung Electronics with the aim to improve local manufacturing skills of solar energy equipment and production materials.

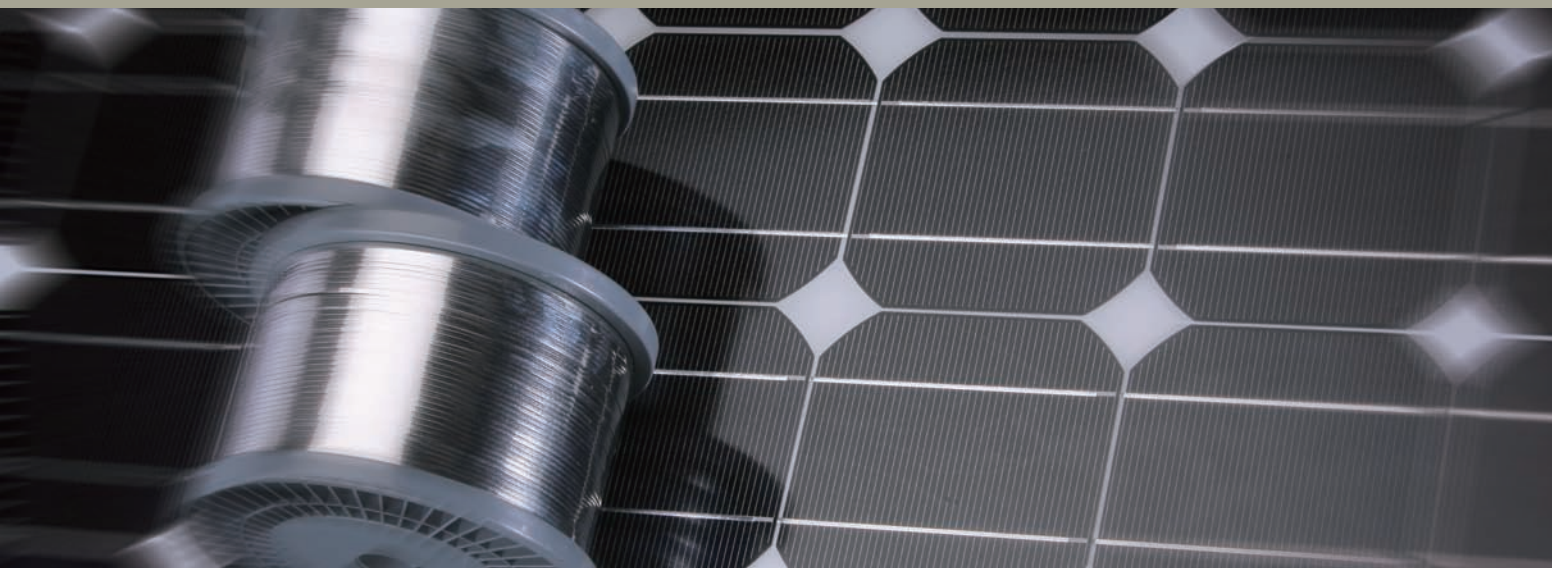
As always, our prominence in the domestic and international markets are recognized by our first-class quality products.

KOS is working hard to assist in the growth of local module companies to compete worldwide by developing the next generation technology, the integrated back contact type ribbon, as well as the PV ribbon.

In order to maximize the efficiency of our solar energy module customers, we here at KOS will continue to stay one step ahead with ever developing technical knowledge and business expertise.

We thank you sincerely for all your support.





KOS presents new solution for photovoltaic ribbon!

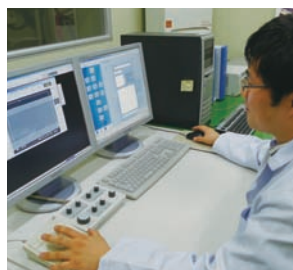
Solar cell module's new partner, KOS

We are dedicated to provide the highest quality services to solar cell module manufacturers around the world. KOS, the global leader in stainless wire industry and the consortium member of Korean government's photovoltaic module development project, introduces cutting-edge PV Ribbon (KOSBON) to become your new partner.



KOS

KOS has more than 30 years of accumulated stainless wire manufacturing and rolling technology. As the world's largest manufacturer of the premium-level stainless spring wires, we have 6 factories in Korea, 2 overseas factories in USA (Atlanta) and Europe (Czech republic), and 10 sales offices (Duesseldorf, Atlanta, Praha, Italia, Istanbul, Tokyo, Osaka, Hong kong, Shanghai, Shenzhen, Singapore) around the world.





KOS Participates in Korean Government's Photovoltaic Project with its Next-Generation PV RIBBON

By participating in three national photovoltaic projects, KOS aims to enhance its PV Ribbon's quality as well as the competitiveness of Korean solar-energy businesses in the global market.

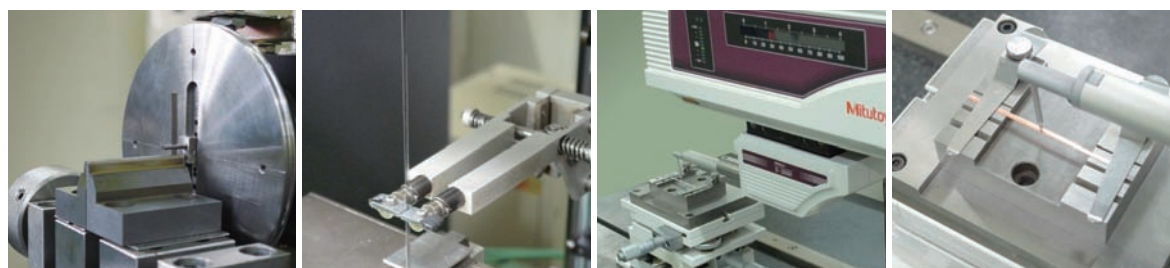
KOS is currently involved in following projects:

1. Development of 150 μ m grade photovoltaic module supervised by S-Energy.
2. Development of high-efficiency IBC silicon solar cell and module manufacturing technology supervised by Hyundai Heavy Industry.
3. Enhancement of photovoltaic module's reliability with Samsung Electronics.

In cooperation with excellent solar-energy businesses in Korea, KOS plans to provide the highest quality products and services to solar cell module manufacturers around the world. Moreover, with increasing market demand, KOS plans to continuously expand its production lines to obtain 1GW annual production capacity by 2011.

We strive to enhance customer value added

KOS promises fast delivery, competitive price and differentiated services to our valuable customers. We are devoting all our efforts on research and development of next generation PV Ribbon to accomplish early grid parity. Also, we will be providing premium-level products and services to our customers through 9 worldwide sales network.



● Features

- Uniform thickness of core and lower yield strength reduce thermal stress. They increase durability of module.
- Uniform solder thickness and less deviation of both side's solder thickness contribute an excellent solderability
- Customized variable dimension of core, solder and solder thickness
- Good camber throughout the whole length
- Good layer winding provides good feedability at tabber. It increases the productivity.

● Core _ Size and Properties

Material	ETP-Cu OF-Cu OF-Cu	UNS C11000 Cu > 99.90% UNS C10200 Cu > 99.95% UNS C10100 Cu > 99.99%
Dimension		Thickness : 0.05 – 0.50mm Width : 1.00 – 6.00mm
Tolerance		± 5% of nominal dimension
Mechanical properties	Soft	Tensile Strength < 240MPa Yield Strength < 120MPa Elongation > 30%
	Super Soft	Tensile Strength < 200MPa Yield Strength < 100MPa Elongation > 30%

● Solder _ Composition and Properties

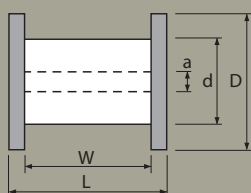
Composition	Solidus temp.(°C)	Liquidus temp.(°C)
Sn100	232	232
Sn60Pb40	183	190
Sn63Pb37	183	184
Sn62Pb36Ag2	178	190
Sn96.5Ag3.5	221	221
Sn96.5Ag3Cu0.5	218	219

● Solder thickness : 10 ~ 40µm, Tolerance : ± 5µm

● Camber : max 5mm/m

● Packing

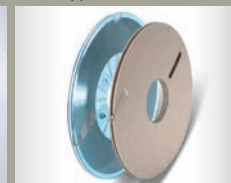
Type	D(mm)	d(mm)	W(mm)	L(mm)	a(mm)	Net wt.(kg)
P-2	130	80	90	110	21	2.5
P-4	160	90	90	114	21	4
B-PS	152	102	102	122	16	4
DIN125	125	80	100	120	16	4
DIN160	160	100	128	160	22	8
Disc	380	200	Variable	Variable	100	> 2



Spool



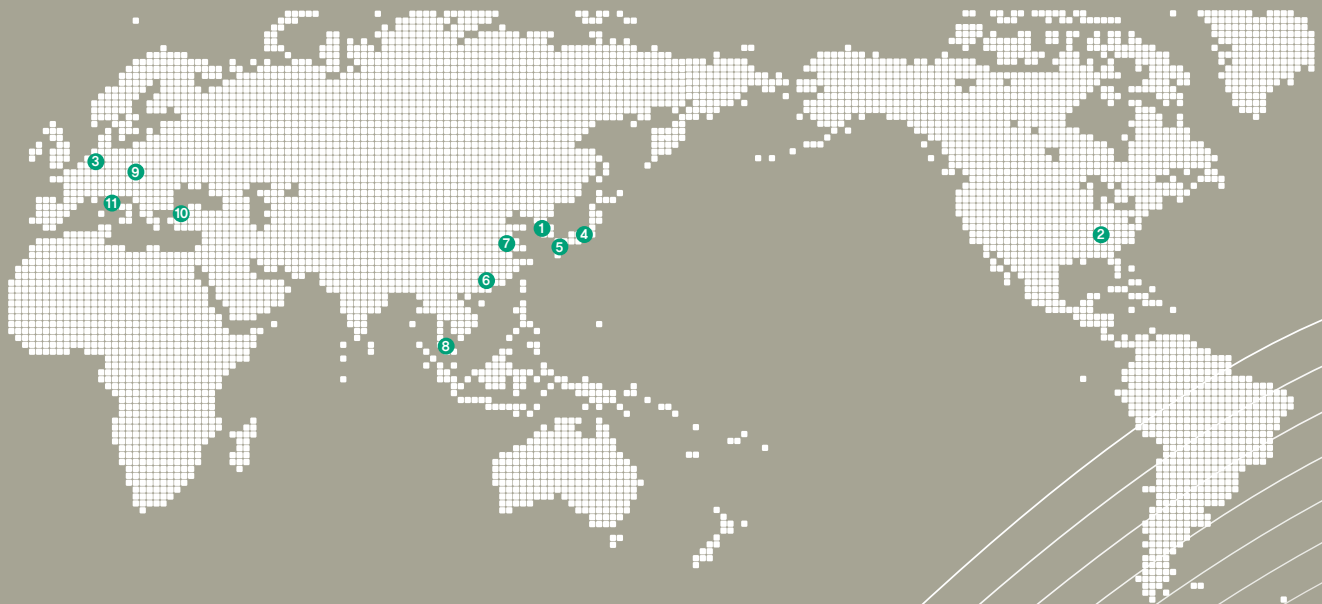
Disc type



Small Box



Global Network



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- Okmyung Factory (Pohang)
- Yusan Factory (Yangsan)
- Euryung Factory (Euryung)
- Samrak Factory (Busan)
- Gamjeon Factory (Busan)

Overseas

- America Factory (Atlanta)
- Czech Factory (Lovosice)

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