

The logo for Hansol Technics features a blue square above a green square, both positioned to the left of the word "Hansol". The word "Hansol" is written in a large, bold, black sans-serif font. Below "Hansol", the word "Technics" is written in a smaller, black sans-serif font.

Hansol
Technics

Hansol Technics

Global Solar Material Company



About Hansol Group

Hansol declared independent management separated from Samsung Group in 1991, Hansol is leading the industry in a variety of fields with about 20 companies.

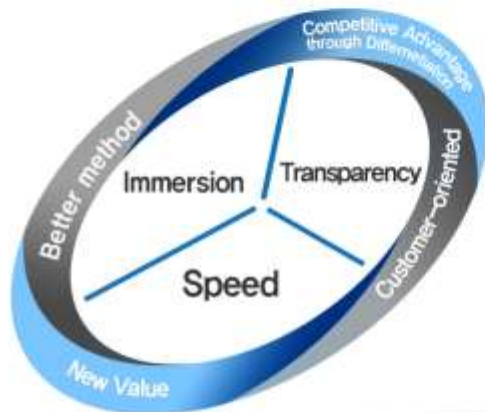
Hansol Overview

Hansol means Big pine tree

Our Mission

Achieve competitive advantage through differentiation, implement the maximum value, and commit to sustainable development with customers

Our Principles





SAMSUNG



SHINSEGAE

1993

1995

1991

1997

Food
Food Materials
BIO
Living Resource

Electronic
Paper
Home material
Chemical
Plant
Logistic
Resort
IT solution

Electronic
Heavy Industry
Finance, Insurance
Construction
Chemical
Trading

Hotel
Department
Distribution
Duty Free Shop
Construction

Hansol Business Materials Business

Hansol Hodings



Achieve Competitive advantage through differentiation, implement the maximum value, and commit to sustainable development with customers

Hansol Technics



We aim to be the best in IT parts and materials.

Hansol Paper



Hansol Paper specializes in high-quality paper production and takes pride in its role of connecting nature, culture and people.

Hansol Papertech



Daehan Papertech is committed to making the best packaging papers.

Hansol Home Deco



We specialize in eco-friendly construction materials that create a living space filled with happiness.

Hansol Chemical



We produce chemical materials with the latest technology in the field of fine chemicals in order to contribute to customer satisfaction and industry development.

Hansol Business Solution Business

Hansol EME



We are a leader in the paper, incineration, power and waterworks plant sectors that form the foundations of any industry.

Hansol Logistics



As the managing partner responsible for the A to Z of a client's logistics, we provide more than simple logistics.

Hansol Development



We provide a space for rest and recreation where nature and culture, sports and leisure come together in harmony.

Hansol PNS



We bring new values to customers with our superior capacity in the IT service and paper distribution sectors.

Hansol Inticube



A new and more enjoyable digital world is coming with the help of high-quality and high-efficiency IT technology and solutions.

Hansol Secure



The World Leading Security Solution Provide.

About Hansol Technics

With evergreen challenge and creativity,
Hansol is born again as the 21st century world best company

KOSPI

(Korea Composite Stock Price Index)

Hansol Technics

A004710

Hansol Group

www.hansol.com

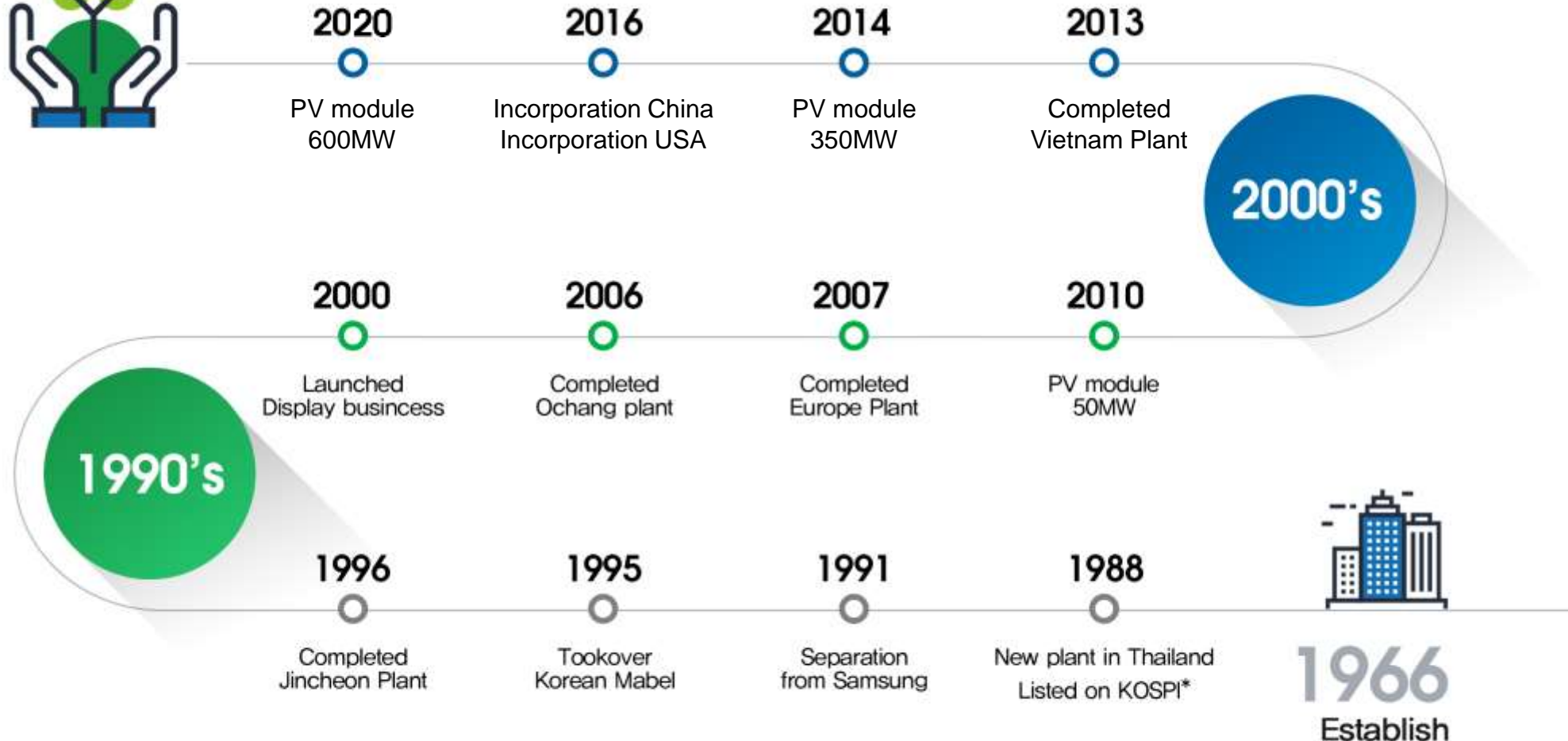
Hansol Technics

www.hansoltechnics.com



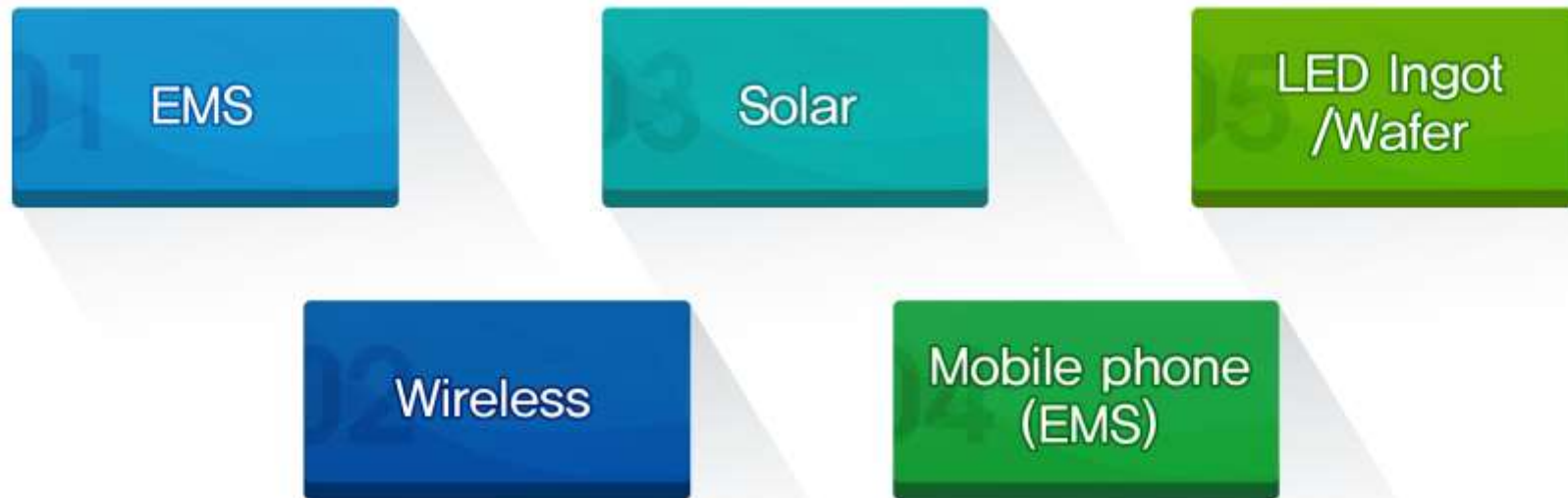
Hansol Technics History

Hansol Technics will grow to the world-leading value-added enterprise of the 21st century by providing the best products and services with the spirit of continuing challenge and creativity



Part, Material Leading Company Hansol

“ *The LEADING COMPANY in the COMPONENTS and MATERIALS* ”



Hansol Technics is making every effort to be a leading company in the business of

- 1) Electronic components for digital power, solar inverter, LED TV BLU
- 2) LED ingots, wafers
- 3) Solar Module

based on top-level of quality, R&D ability, innovative cost competitiveness

Division	Number of employees
Domestic	1,000
Overseas	10,600 (Thailand, Vietnam, etc.)

Hansol Technics

With the vision of man-centric, technology-based and future-oriented management, Hansol Technics is growing to the leading company in the components and material sector, such as EMS, LED Ingot/Wafer and Solar Module, based on technology and innovation



Head Quarters

[A] 5 FL, B-PINE AVENUE Bldg., EUjiro 2-ga, Jung-gu, Seoul, Korea

[T] 02 3287 7903 [F] 02 6031 0940

Suwon

[A] 16, Deogyong-daero 1556beon-gil, Yeongtong-gu, Suwon-si, Gyeonggi-do

[T] 031 8061 2620 [F] 031 8061 2699



Jincheon

[A] 27-19, Hancheon-ri, Deoksan-myeon, Jincheon-gun, Chungbuk

[T] 043 540 8000 [F] 043 536 8105



Ochang

[A] 140, Gwahaksaneop 1-ro, Oksan-myeon, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do

[T] 043 219 3000 [F] 043 219 3410



Hansol Technics

With the vision of man-centric, technology-based and future-oriented management, Hansol Technics is growing to the leading company in the components and material sector, such as EMS, LED Ingot/Wafer and Solar Module, based on technology and innovation



Hansol Technics

Jincheon



• Site 31,000m² / Building 46,000 m²

Hansol Technics Jincheon



BLU / LCM



Automotive
electricity fields



UV light firearms



Solar Inverter



Plant
A



Plant
B



Plant
C

Hansol Technics

Ochang



• Site 50,000m² / Building 46,000 m²

Hansol Technics Ochang



Plant A



Plant B



Plant C



PV Module



Sapphire Ingot



Sapphire wafer

Hansol Technics

Thailand Plant

• Site 65,000m² / Building 33,000 m²

Power board for TV and Lighting

168 Moo 1, Tambon Banbung
Chonburi Province, Thailand

Hansol Technics Thailand



Hansol Technics

Vietnam Plant

• Site 66,000m² / Building 46,000 m²

Hansol Technics Vietnam
Yen Binh Industrial Zone

SET



Sub PBA



Injection molding



Samsung Galaxy series



Hansol Technics

Slovakia warehouse

• Site 64,000 m² / Building 33,000 m²

Voderady 396, Slovakia

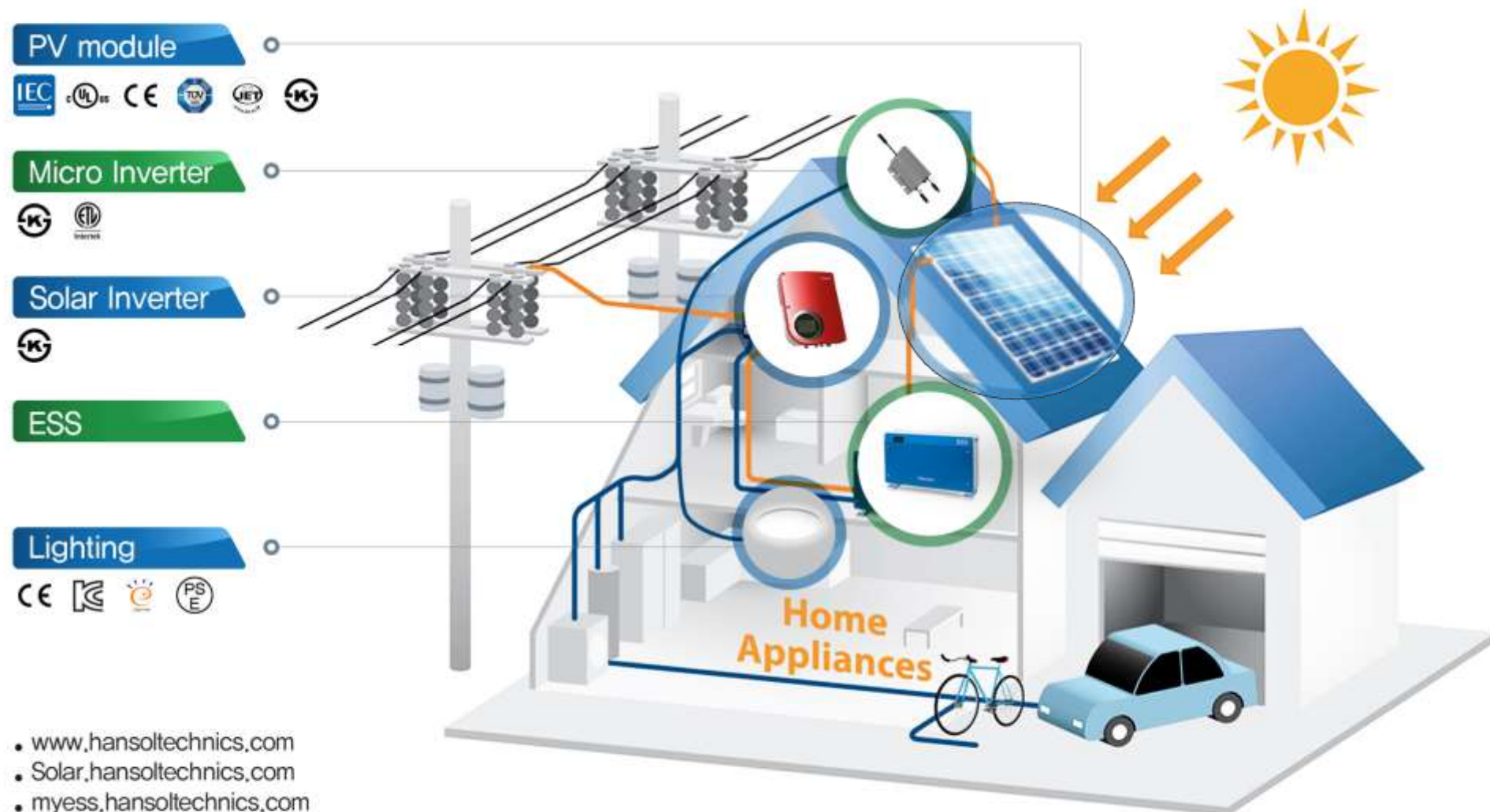
Hansol Technics Slovakia



About Solar Business



Hansol Technics Business



Hansol Technics Business

PV module Key Features

- **Tolerance**
Positive tolerance of +5Wp

0 ~
+5Wp

- **Warranty**
12 Years product warranty
25 Years linear power warranty

25

- **High efficiency**
High efficiency solar cells and materials

20.00%

1,500V

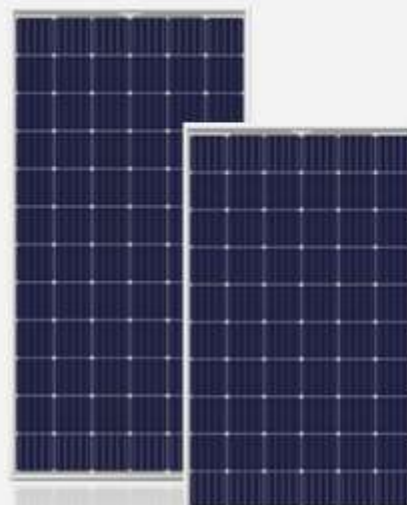
- **Maximum system voltage**
Designed for UL and IEC 1,500V
Saving BoS costs

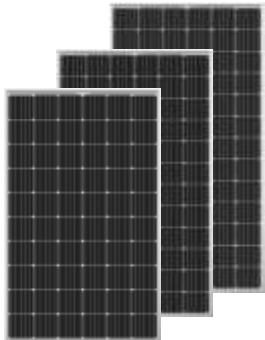
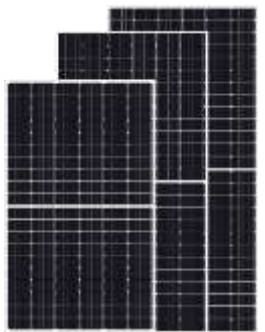
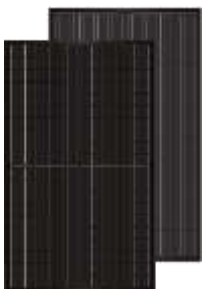
5,400Pa

- **Certified Durability**
5,400Pa snow load
2,400Pa wind load

PID
Free

- **PID Free**
Anti-PID Cells
Anti-PID encapsulation technology



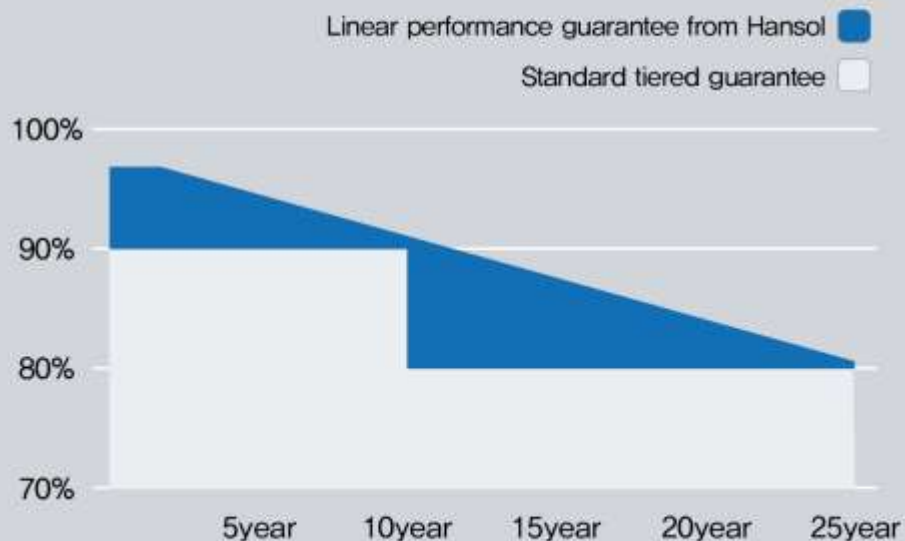
		1Q	2Q	3Q	4Q
Conventional Series					
	78Cells (UE-AN1) 2155×1000×40mm (84.84×39.37×1.57in)	400 (390~400)	400 (390~400)	400 (390~400)	405 (390~405)
	72Cells (UD-AH2) 1994×1000×40mm (78.50×39.37×1.57in)	370 (365~375)	375 (370~380)	375 (370~380)	380 (370~380)
	60Cells (UB-AN1) 1670×1000×35mm (65.75×39.37×1.38in)	310 (305~315)	310 (305~315)	315 (305~315)	315 (305~315)
Half-Cut Series					
	H/C 144Cells (UD-JH2) 2000×1000×40mm (78.74×39.37×1.57in)	-	385 (380~390)	385 (380~390)	385 (380~390)
	H/C 120Cells (UB-JH2) 1675×1000×35mm (65.94×39.37×1.38in)	-	320 (310~320)	320 (310~320)	325 (315~325)
Black Series					
	60Cells (UB-AN1) 1670×1000×35mm (65.75×39.37×1.38in)	300 (290~300)	300 (295~305)	305 (300~310)	305 (300~310)
	H/C 120Cells (UB-JH2) 1675×1000×35mm (65.94×39.37×1.38in)	-	305 (295~305)	310 (300~310)	310 (305~315)

Solar Modules Business

Key feature : World Class Quality

Features

- 25-year linear performance guarantee
- Stable aluminum frame for easy mounting
- Test to 3x IEC standard for maximum reliability



3rd Party Audit

Class
“Above Average”

Quality grading

Rating	Manufacturing Quality	Potential investment risk	Potential technical risk	Bankable	Manageable
Red	Poor	High	Early-life failure or overt safety hazard	No	No
Orange	Below average	Medium-high	Long-term Product failure or significant under-performance	Yes, if managed	Complex
Yellow	Average	Medium	Moderate under-performance	Yes, if managed	Acceptable
Light Green	above average	Medium-low	Limited under-performance	Yes, if managed	Relatively easy
Dark Green	Excellent	Low	None	Yes	Yes

Solar Modules Business

Key feature : Bankable Company

Tier 1 Company

“ *Global TOP Tier company* ”
from Bloomberg

Stability of finance

- Long-lived company for 50years
(Establishment 1966)
- Listed KOSPI
(1988)

Tier 1 PV module manufacturer list

Firm Name	Annual module capacity, MW/year	Firm Name	Annual module capacity, MW/year
Jinko*	10,000	Jinneng	2,000
Hanwha Q-Cells*	10,700	REC Group*	1,500
JA Solar*	10,500	Wuxiwei	1,500
Canadian Solar	8,980	HT SAAS*	1,500
Longi*	8,800	Adani/Alkermis*	1,200
Risen Energy*	8,800	Nico Solar Power/ LRE	1,110
Trina Solar*	8,000	Vikram Solar*	1,100
Chint/Astronergy*	5,500	Yangdian / DMEGC Magnetics	1,000
GCL*	5,400	Jolywood	1,000
Talesun	5,000	ET Solar	1,000
Seraphim*	5,000	Lightway	1,000
First Solar*	5,000	Solyar*	800
Suntech*	3,900	Hansol Technics	600
ReneSola	3,600	S-Energy	500
ZnShine*	3,500	AU Optonics	500
LG Electronics*	2,500	Shinsheng	300
BYD	2,400	Helene*	250
Akcome	2,400	Sharp	210
Eging	2,100	Win Win Winstar	200
Suneco/ Phono Solar*	2,000	Total	131,930



Solar Modules Business

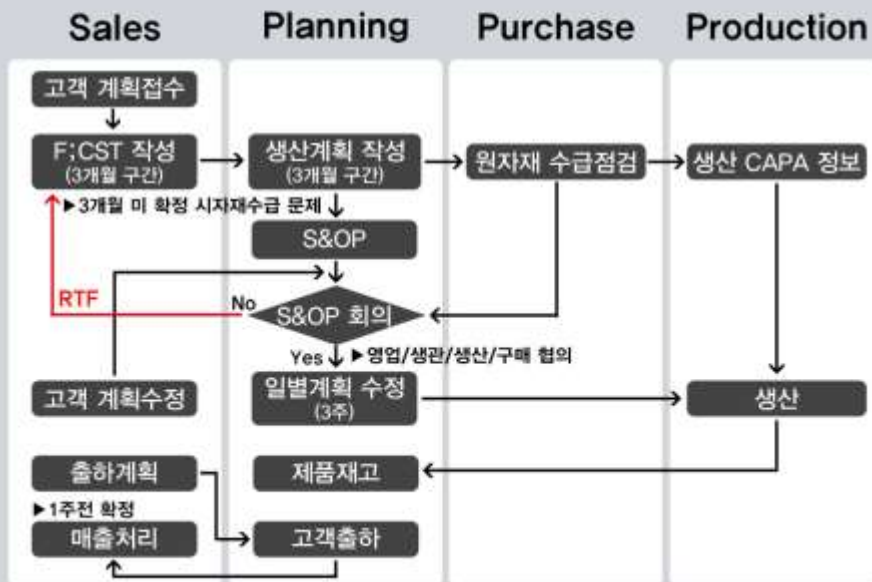
Key feature : Speed & Flexibility

SPEED

- Global branch office and speedy A/S
(USA, Germany, Slovakia, China, Vietnam, Thailand)
- Warehouse operation
and short period of delivery system
based on ERP system

Flexible

“ Various products of ”
series and size



Series	54Cells	60Cells	66Cells	72Cells	78Cells
Power [Wp]	260~280	280~320	320~340	340~380	380~420
Size [mm]	1,480×1,000×35	1,670×1,000×35 1,630×982×35 1,640×992×35	1,832×1,000×35	1,994×1,000×40 1,948×982×40 1,956×992×40	2,155×1,000×40 2,165×1,000×40
Type	Mono Multi Black Half-Cut				
Certificate					

Solar Modules Business

Key feature : Long-term quality assurance system construction

Assembly and module business KNOW-HOW for 20years

- Wide experience of quality control
- Reliability test from raw materials to products

Self Quality System

- Various measuring machine and ability of quality evaluation



Snow Load Tester



Hot-spot tester



Wet leakage tester



Chamber



3D gauge



Vibration tester



Photometer



Mercury amount



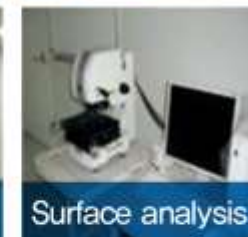
X-Ray



Thermo graphic



Impact test



Surface analysis



Tensile force

Solar Modules Business

Key feature : High Level Long-term quality assurance

Test	Standard	Conditions
PID	IEC TS 62804-1:2015	900Hr, ±1,500V, Temp. 85°C
Ammonia	IEC 62716:2013	NH3 6667ppm, Temp. 60°C, Humi. 100%
Salt mist	IEC 60068-2-52	Level 6 (Highest class)
Damp Heat	IEC 61215:2005 2 nd Edition	3,000hr, Temp. 85°C, Humi. 85% (IEC Standard x 3times)
Thermal cycling test	IEC 61215:2005 2 nd Edition	600 Cycles, Temp. -45°C ~ 85°C (IEC Standard x 3times)

* The certificates and test reports by

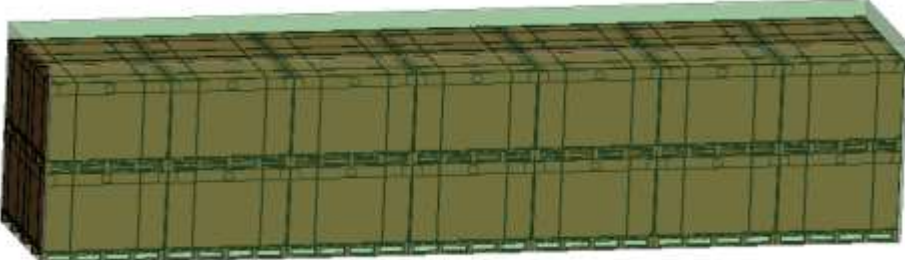


Appendix. Packaging conditions

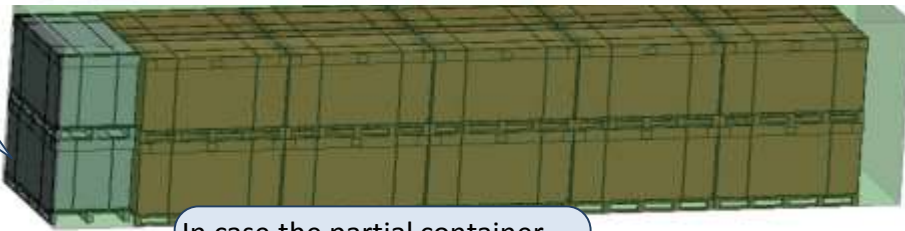


Double stack

Place the two pallets on the front of container



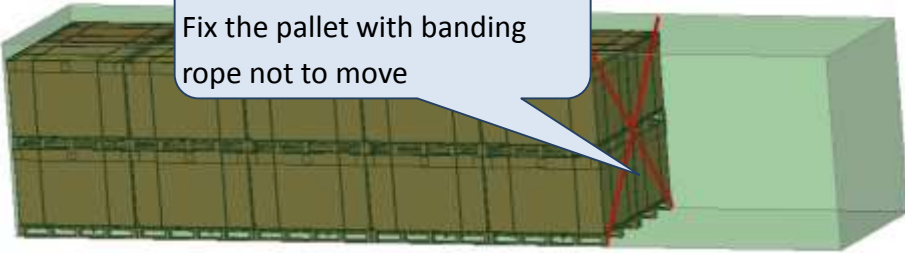
Type A



Container Door

Type B

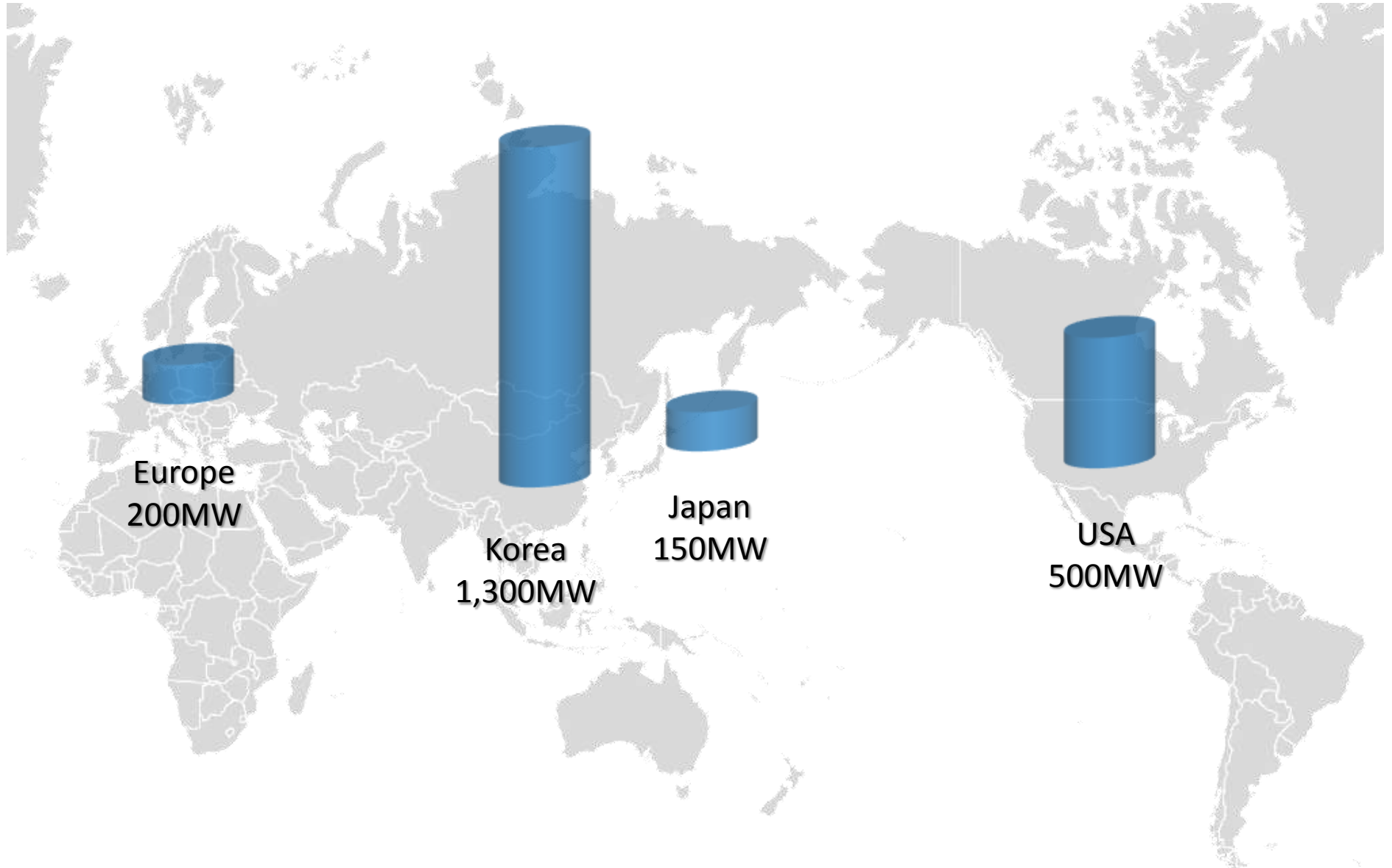
In case the partial container. Fix the pallet with banding rope not to move



Type C

Module Array	Module Size	Loading			Module Weight (kg)	Packing (1pallet) ±5%		
		PCS/Pallet	Pallet/Con	PCS/Con		Size	Net Weight	Gross Weight
60	1640 x 992 x 40	26	28	728	19.0	1700 x 1130 x 1190	494	654
	1640 x 992 x 35	29	28	812	18.5	1700 x 1130 x 1190	537	597
	1670 x 1000 x 35	29	26	754	18.9	1730 x 1130 x 1200	548	608
72	1994 x 1000 x 40	26	22	572	22.5	2050 x 1130 x 1200	585	645
	1994 x 1000 x 35	29	22	638	21.5	2050 x 1130 x 1200	624	684

Appendix. Shipping Reference



Appendix. Installation result



Appendix. Reference (USA)

Swansea 2.2MW



New York 2.7MW



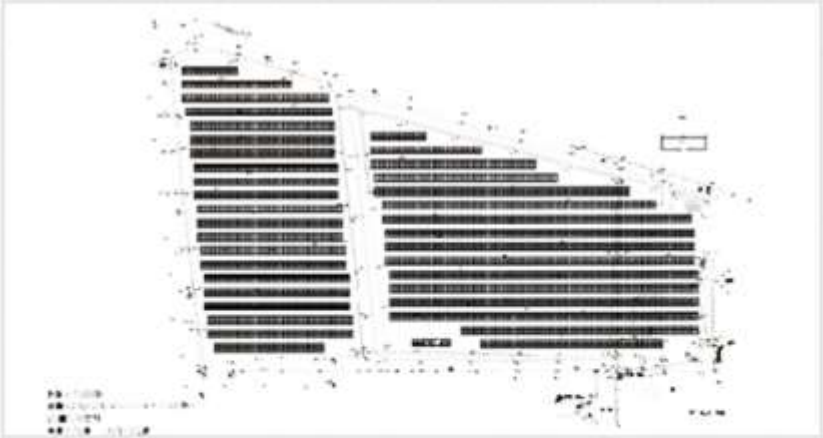
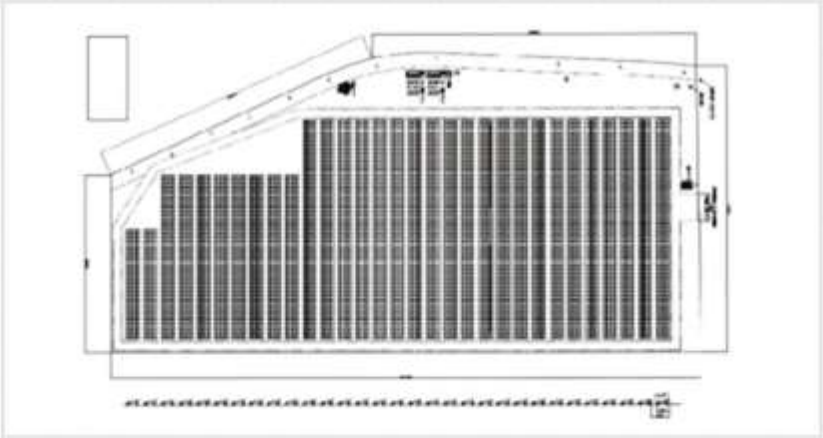
Carver 2.8MW



Shrewsbury 3.3MW



Appendix. Installation result (JAPAN)



Appendix. Reference (Korea)



Appendix. Reference

1.0MW+ 0.4MW +0.8MW



0.8MW+0.75MW+0.5MW



Appendix. Reference

0.5MW+ 1.0MW

0.1MW+1.0MW



Hansol Technics

한솔테크닉스는 믿음과 신뢰를 바탕으로 최고의 비즈니스 파트너가 되겠습니다.

