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pv magazine webinars

TOPCon heads to the rooftop

5 December 2022

10:00 am – 11:00 am | CET, Berlin, Madrid
4:00 pm – 5:00 pm | Hanoi
5:00 pm – 6:00 pm | CST, Beijing

Mark Hutchins
Editor
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Ellen Ma
Product Manager
Jolywood

Florian Mechler
Product Manager
IBC Solar

Welcome!

pv magazine webinars

Do you have any questions? ? 🙋

Send them in via the Q&A tab. 👉 We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 📹

We‘ll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience. 👀 💡

JOLYWOOD

All N Type,

Power your home

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PART 1

JOLYWOOD

About Us

NIWA

JOLYWOOD

JOLYWOOD SOLAR

Leader of N-type bifacical solar cell technology

Enterprise Strength

- Bloomberg Tier 1 brand
- MunichRe reinsurence brand
- PVCycle Member
- EuPD Top Brand
- Global Top 500 Energy Enterprise

R&D Strength

- 300+ R&D team member
- 200+ applied patents
- Large size cell achieve 26.1% efficiency in the lab

Strong Production Capacity

- Cell efficiency achieved 24.8% in mass production
- Module capacity 3.5GW
- Cell capacity 7.6GW
- 12 GW under construction

Global Recognition

- Shipped 5.8GW+ product to over 60 countries
- Over 10% market share in the Middle East

PART 2

NIWA

J-TOPCon 2.0

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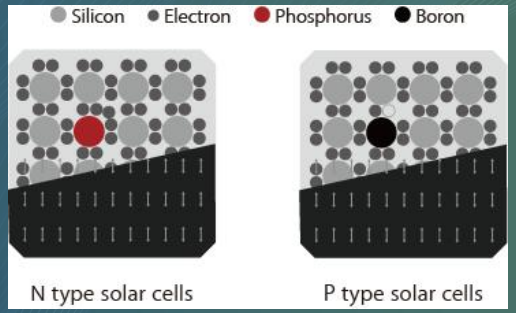
What is N Type?



Advantages of N type module:

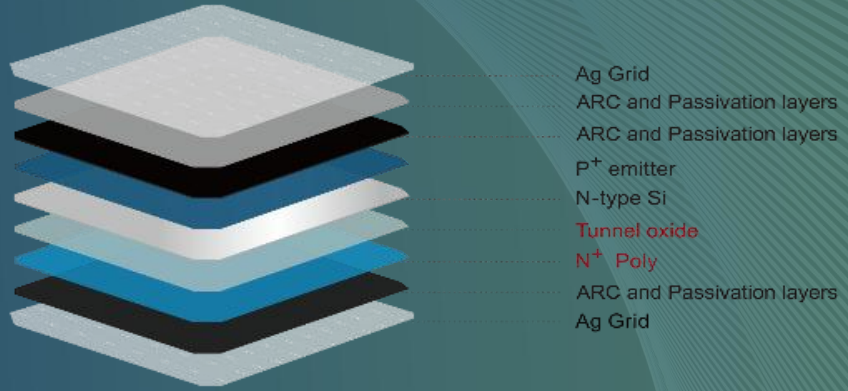
- No LID/LeTID
- have longer lifetime
- lower degradation
- higher bifacial rate

.....

What is N-TOPCon Technology?

TOPCon (Tunnel Oxide Passivated Contact)

Excellent surface passivation & field-effect passivation



J-TOPCon 2.0 Key Technology

The technical route of polysilicon deposition by LPCVD has many processes, and the efficiency and yield are constrained, and the equipment depends on imports.It is urgent to upgrade the technical route and replace the low-cost localized equipment

P-PERC	J-TOPCon1.0	Phosphorite TOPCon
Texturing	Texturing	Texturing
Phosphorus Diffusion	Boron Diffusion	Boron Diffusion
Laser	Rear Etching	Rear Etching
Rear Etching	LPCVD	LPCVD
ALD	Ion Implantation	Phosphorus Diffusion
Front PECVD	RCA	Edge Etching
Rear PECVD	Annealing	Cleaning PSG
Laser	Rear PECVD	ALD
Metalisation	Edge Etching	Front PECVD
	ALD	Rear PECVD
	Front PECVD	Metalisation
	Metalisation	

Ion injection route

low yield
high cost
more process

Phosphorus diffusion route

low yield
high cots
high leakage
more process

LPCVD deposit polysilicon wrap,
need extra etching and diffusion process

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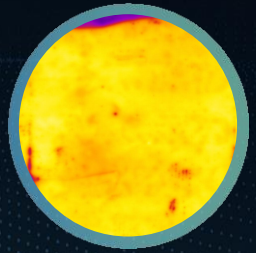
J-TOPCon 2.0 Key Technology

LPCVD(Low Pressure Chemical Vapor Deposition)



Unavoidable wrap-around poly Si

cell efficiency ↓

yield ↓

cost↑

J-TOPCon 2.0 Key Technology

POPAID Technology

- Plasma Assisted Oxidation & Plasma Insitu-doping Deposition
- No polysilicon wrap -> Shorter Process, Higher Efficiency, Higher yield
- Thickness of poly layer, doping concentration can be precisely controlled
- Mass production reached 24.8%

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J-TOPCon2.0 Key Technology

POPAID - Plasma Assisted Oxidation & Plasma Insitu-doping Deposition

- **Electric Leakage** reduce from >0.5% to <0.01%
- **Black Edge** reduce from >1.1% to < 0.1%
- Minimised risk of **hot spot** and **fire**,

Much Safety For Your Roof!

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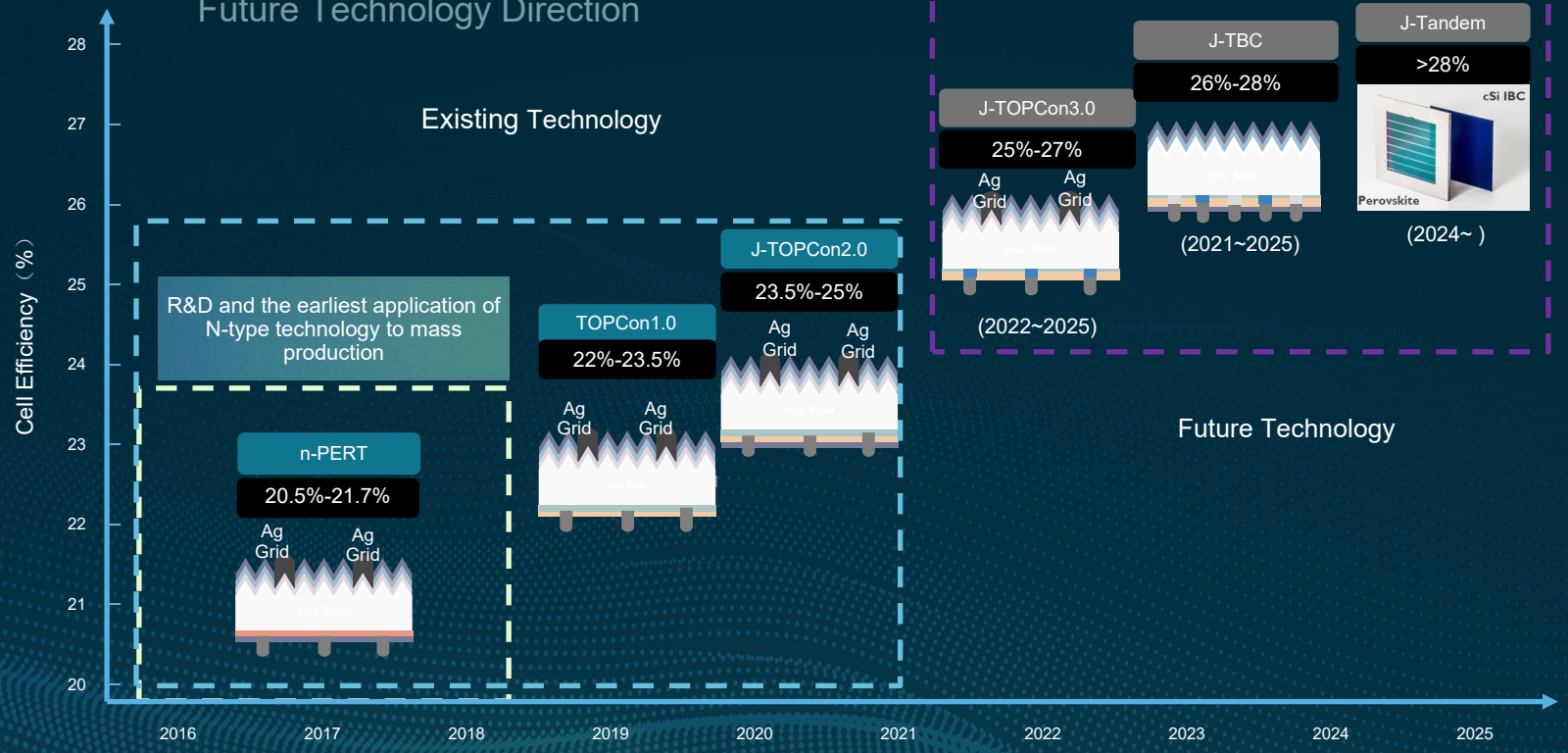
Future Technology Direction



PART 3

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Product Key Advantage

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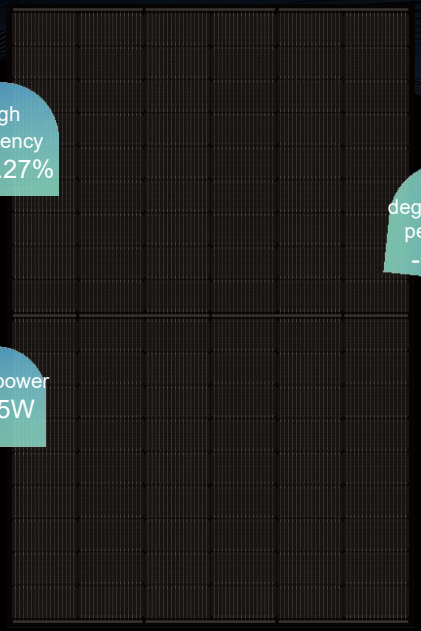
NIWA Product technology Advantage



182 182mm NTOPCon Cell Technology

Non-destructive laser Scribing Technology

16BB **SMBB** *-16BB*

LID no LID Low Risk of LeTID

85% Bifaciality ***highest 85%***

-0.30% Lower Temperature Coefficient ***- 0.30%/℃***

30 High Reliability ***30 years warranty***

20Kg ***lighter weight*** Reduce labor cost ***increase efficiency by 20~30%***

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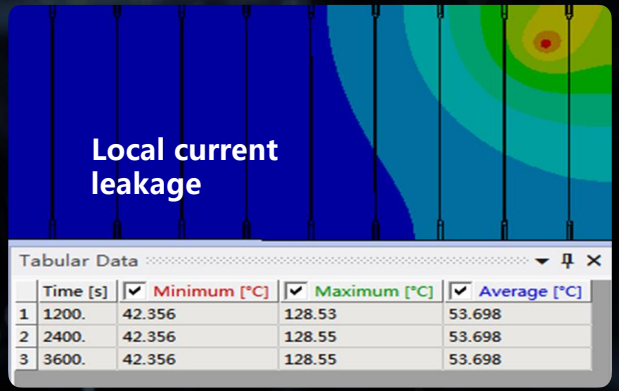
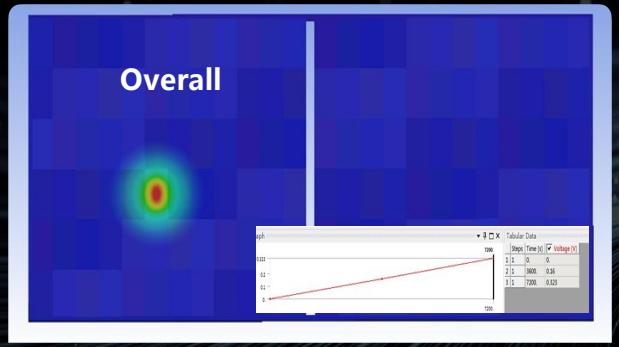
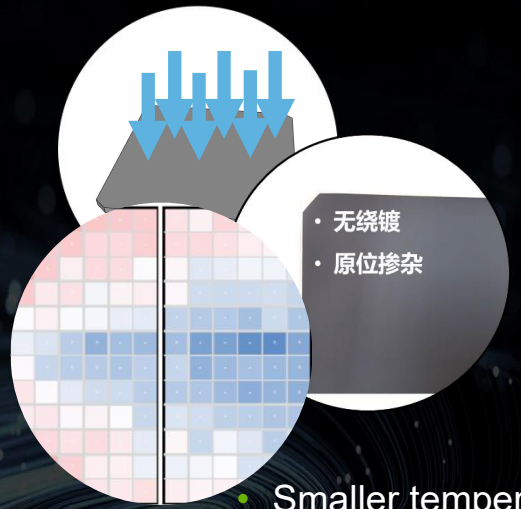
Low risk of hot spots,

More safety.







- Smaller temperature difference between cells
- Lower risk of hot spot

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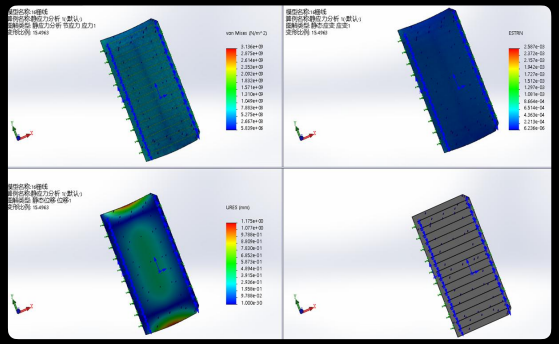
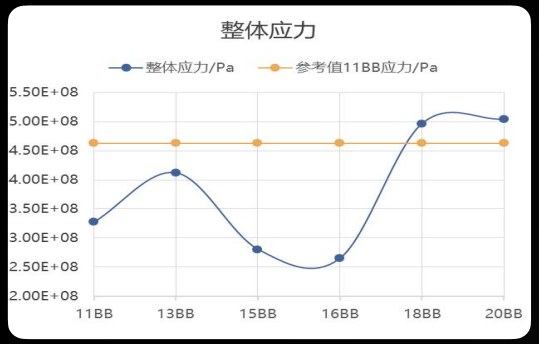
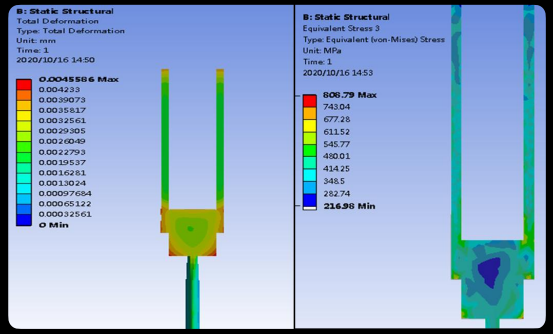
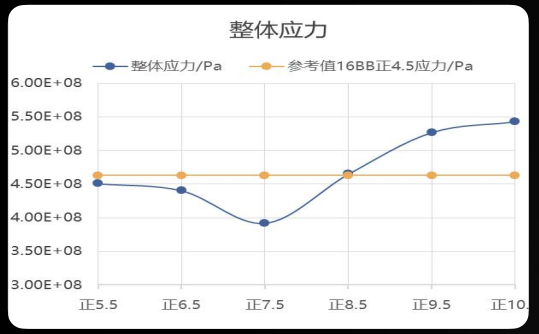
SMBB Low Stress Design



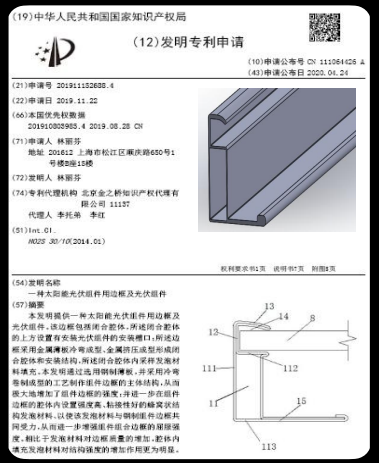






- Emulational Thermal Dynamic Process;
- Optimized design 16BB;
- Combinated special busbar design;
- Reduced residual stress;
- Reduced micro-crack

High-strength Steel Frame Design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(12)发明专利申请

(10)申请公布号 CN 111064425 A
(43)申请公布日 2020.04.24

(21)申请号 201911152688.4
(22)申请日 2019.11.22
(66)本国优先权数据
201910003985.4 2019.08.28 CN
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(51)Int.Cl.
H02S 30/10(2014.01)

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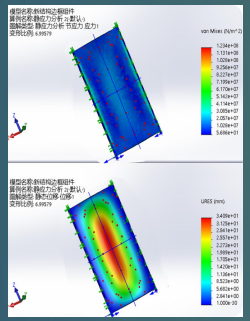
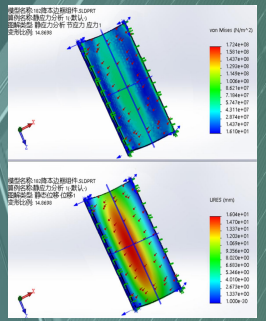
(54)发明名称
一种太阳能光伏组件用边框及光伏组件
(57)摘要
本发明提供一种太阳能光伏组件用边框及光伏组件，该边框包括闭合腔体，所述闭合腔体的上方设置有安装光伏组件的安装槽口，所述边框采用金属薄板冷弯成型，金属板压成型形成闭合腔体和安装结构，所述闭合腔体内采用发泡材料填充。本发明通过选用钢制薄板，并采用冷弯制成型的工艺制作组件边框的主体结构，从而极大地增加了组件边框的强度，并进一步在组件边框的腔体内设置强度高、粘接性好的蜂窝状结构发泡材料，以使该发泡材料与钢制组件边框共同受力，从而进一步增强组件组合边框的屏蔽强度，相比于发泡材料对边框质量的增加，腔体内填充发泡材料对结构强度的增加作用更为明显。

Zinc magnesium aluminum steel frame

VS

Aluminum frame





- The patent for the invention of closed type zinc-magnesium aluminum steel frame was granted in 2019, while more than 10 related patents were laid out;
- Zinc magnesium aluminum steel frame has better load resistance than aluminum frame, and more stable roof installation.
- Compatible with conventional module installation methods.

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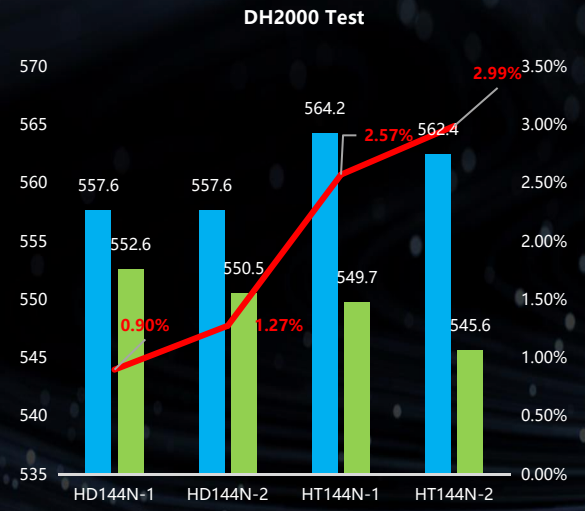
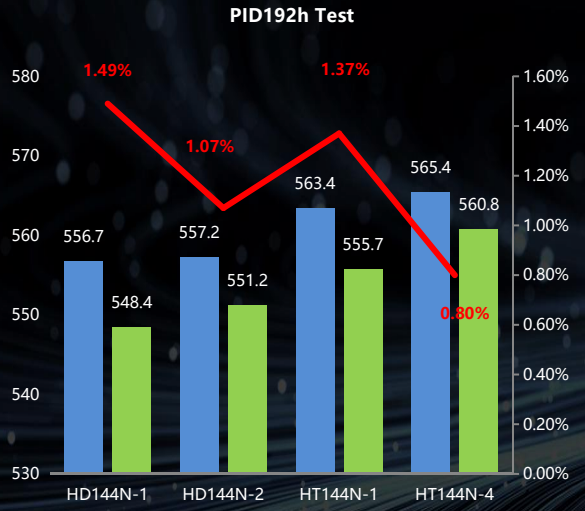
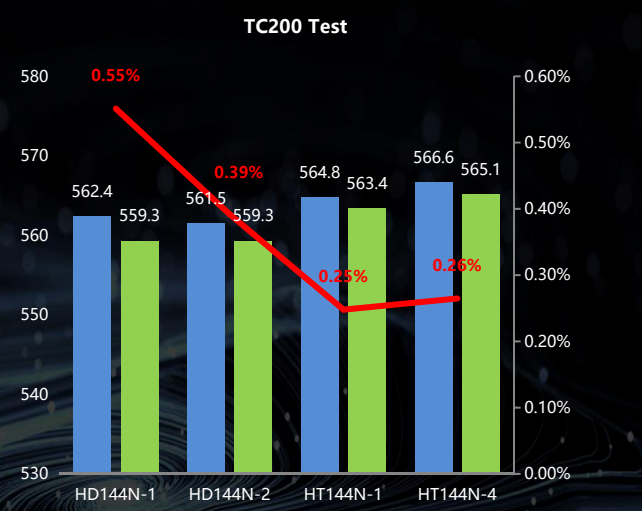
High Reliability of Product

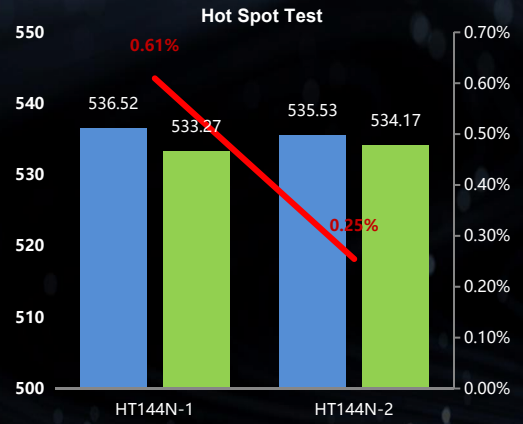


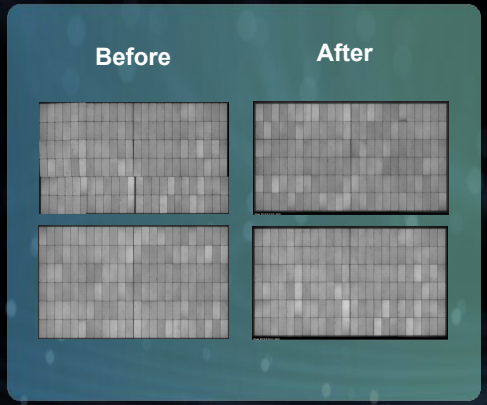




NIWA TOPCON modules pass 2x IEC reliability testing standards, and ensure life-cycle power generation reliability

High Reliability of Product





Hail Test		Pmax
JW**06 2	front	413.86
	back	413.47
	degrada-tion	0.10%

- No polysilicon wrap around，low current leakage，excellent performance in module hot spot test；
- Reasonable optimized design, low residual stress in the module, almost no change in appearance and EL in hail test, and low degradation.

PART 4

NIWA

Product Planning

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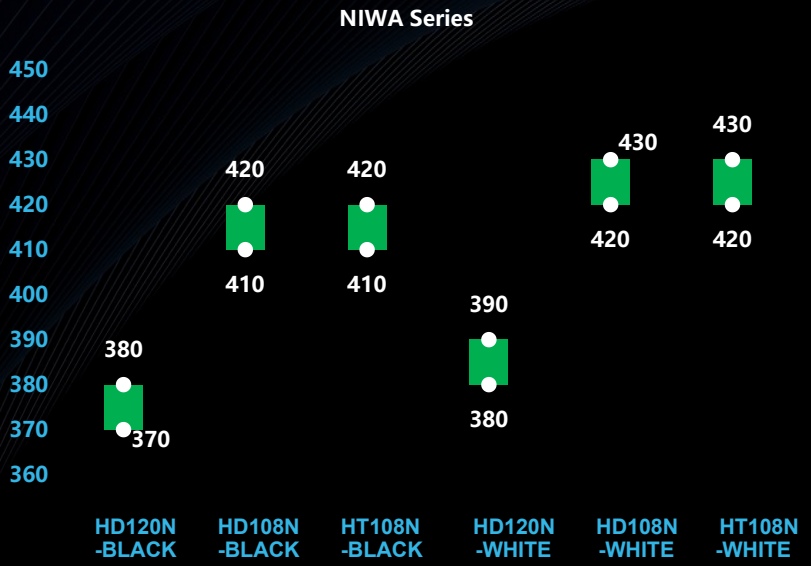
NIWA Product Introduction



Future NIWA Product Direction

- perfect aesthetic appearance
- high power
- high-intensity light weight
- high reliability operate safety


JOLYWOOD
NIWA
Thanks!

IBC SOLAR

Have sun!

IBC SOLAR –
Official partner of the sun.

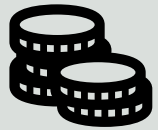
For a world worth living in.

Agenda

- IBC SOLAR
- Jolywood references

IBC SOLAR

Facts & figures

				
40 years of experience	**380** employees in **six** countries and **14** locations	**6 GW** installed power	**374 million** turnover for 2021	**3 million** people worldwide supplied with solar power

IBC SOLAR is a global provider of photovoltaic, energy storage solutions and services.
The company offers complete systems and covers the entire product range from planning to the turnkey handover of photovoltaic systems. The product range comprises solar parks, self-consumption systems for commercial enterprises, private households and off-grid photovoltaic systems.

Segments

Residential

- We offer photovoltaic systems with storage and energy management. With the flexible connection of e-mobility and heat on request.

Commercial & Industrial

- We offer one-stop sustainable concepts and energy solutions that include photovoltaics, energy management systems, storage, charging infrastructure and monitoring especially for commercial customers.

Powerplants

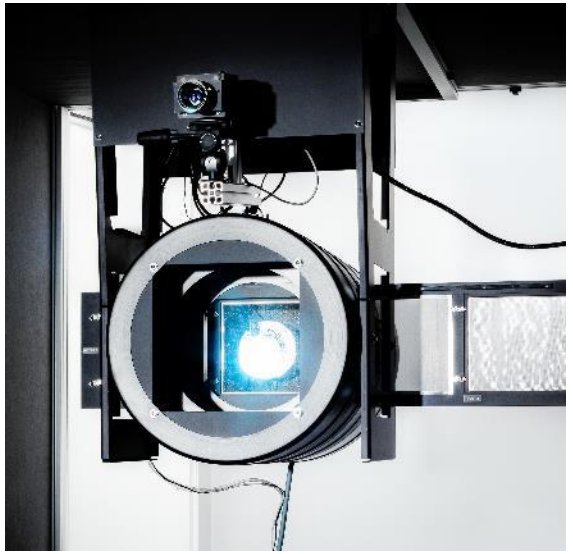
- We cover all phases of the construction of a solar park. From project development, investment management, planning and implementation to operations & maintenance.

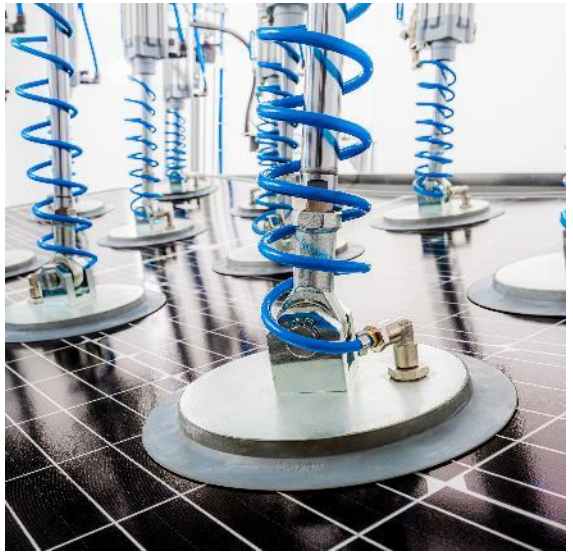
Quality standard

Outstanding system
and component quality

SUNLAB test laboratory:

- Flasher
- Climate chambers
- Loading table
- Electroluminescence camera





Jolywood references

East/West system
IBC AeroFix G3
12 kw/p

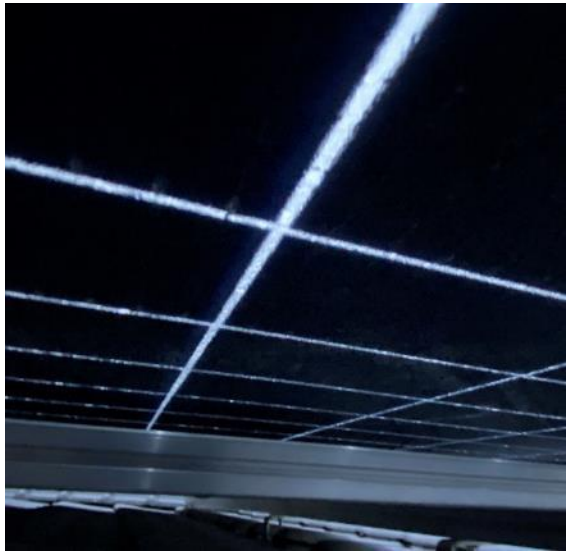
Due to the smaller size, the modules are easier to transport to the roof.

The benefit of bifaciality to generate electricity from both sides and the advantage that glass/glass modules make a solid impression convinced me.

South/West brick pitched roof system 6 kw/p

Through TOPCon, I can provide the customer with the best performance, in the form of more electricity generation, at a good price.

I was impressed by the outstanding warranty period of 25 years product warranty and 30 years performance warranty.



East/West system
IBC AeroFix G2
14 kw/p

I chose this product because it allows me to offer customers an excellent warranty period of 25 years product warranty and 30 years performance warranty.

When selecting modules, it was important to me that they generate more power than other modules and that they are bifacial. That's why I chose these.

South brick pitched roof system 9 kw/p

Since the glass/glass modules make a solid impression and the smart size of the modules is easier to transport, I prefer to install these.

The modules look good and, because of the black frame, match my black roof perfectly, giving me a unique look. In addition, you generate more electricity than with the usual modules.

Have sun!

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TOPCon heads to the rooftop

Q&A

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10:00 am – 11:00 am CET, Berlin, Paris, Madrid

Thursday, 8 December 2022
11:00 am – 12:00 pm EST, New York City
5:00 pm – 6:00 pm CET, Berlin, Paris, Madrid

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New entrants bring new perspectives: Hybrid inverter series for C&I applications

How to protect BESS to increase reliability and maximize return on investments

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Mark Hutchins
Editor
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