



PHOTOVOLTAIC MODULE  
**MONOCRYSTALLINE**

**Q300**  
TOTAL BLACK

**Invent**<sup>®</sup>  
ENERGY IN ACTION



## MODULE INVENT Q: ITALIAN QUALITY IN PHOTOVOLTAICS

**Q300**  
TOTAL BLACK

The solar modules Invent Q are all made in Italy according to certified quality systems and with a high-output automated production line.

They are characterized by the exceptional quality of workmanship and its components.

The modules Invent Q are provided with only positive tolerance (0/+3%), this ensures that the module will in any case, produce more than the declared energy, resulting in exclusive advantages for purchasers.

All Invent Q modules are equipped with Invent's patented **InvisibleCell**<sup>®</sup> technology, which makes the module's electrical connections invisible, making the panels aesthetically pleasing with an elegant and modern design.

At the end of their lifespan, these modules will not give you any problems because Invent is a member of PV Cycle.



made in Italy

## Q300

TOTAL BLACK

Up to <b>15</b> years of warranty on materials	<b>25</b> years of warranty on power
InvisibleCell TECHNOLOGY	Power tolerance <b>0/+3%</b>
<b>+25%</b> Glass Thickness High transmittance <b>4mm</b>	<b>+50%</b> Mechanical Load Subjected to a pressure of <b>7500 Pa</b>
<b>+20%</b> Hail Resistance Subjected to hail of <b>30mm</b>	<b>PV CYCLE</b>
<b>Ammonia test</b>	<b>Salt spray test</b>

## Q QUALITY

InvisibleCell®  
TECHNOLOGY

Q panel consists of **60 polycrystalline silicon photovoltaic cells** (1), which generate high power in each module.

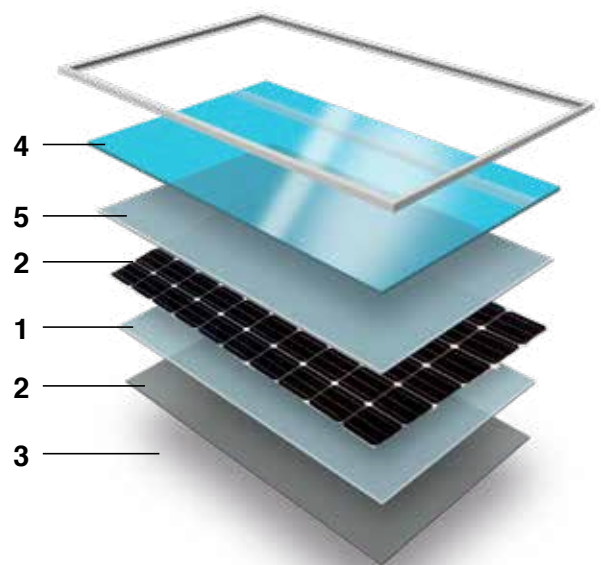
Cells are laminated between two layers of EVA (ethylene-vinyl acetate)(2). In addition, a polyester laminate (PYE) (3) guarantees an effective sealing of the module and long lived, creating a barrier to oxygen and moisture.

The structure (4), is available in different oxidations, it is made of a solid aluminum alloy, stress-resistant, corrosion-resistant, and easy to fasten.

The front part of the module consists of a tempered solar glass of 4 mm of thickness (5) with high light transmittance, that guarantees a **25% greater thickness compared to the market standard, a 50% higher mechanical load and a 20% higher hail resistance.**

On the back of the module, a junction box is fixed, equipped with bypass diode, which prevents the overheating of the individual cells (hot-spot effect). It is resistant to changes in temperature within a range of - 40°C, + 85°C, with a degree of protection IP65.

It is equipped with fast connections ("plug & play") which help to speed up the installation of the modules and of the two cables (4 mm<sup>2</sup>), each of 100 cm long.



WELL-TECH 2007  
Premio all'Innovazione Tecnologica

## WARRANTY



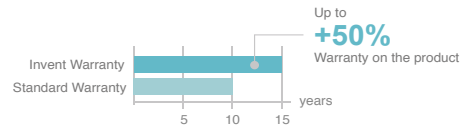
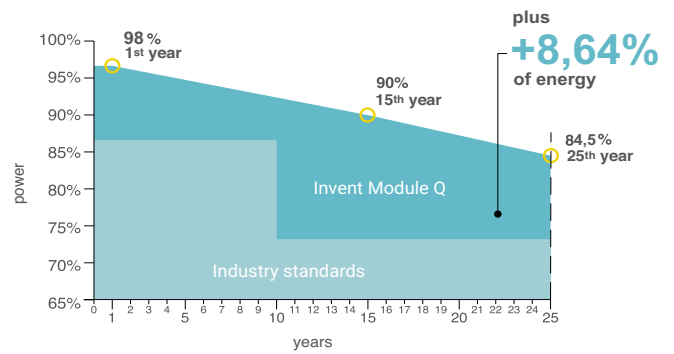
Power is guaranteed: **98% the first year, the 15th year  $\geq$  90%, the 25th year  $\geq$  84,5% of the power.**

Invent grants a **10 year warranty** for manufacturing defects and materials, that can be extended to 15 years.

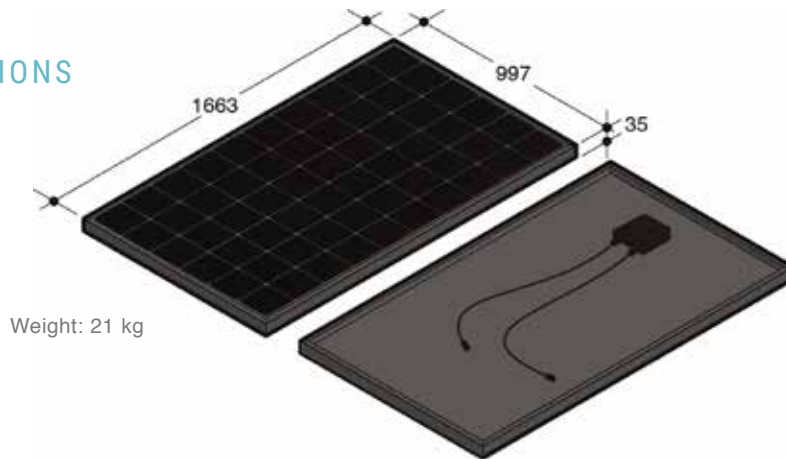
As shown in the graph, these warranty conditions signify advantages to the system's productivity compared to present standards on the market:

- More energy in the module's life cycle: **8,64% higher than the industry standard.**
- More power: minimum peak power 98% in the first year.
- Only 0,6% reduction of annual power in 24 years.

The warranty on chromatic variations of **InvisibleCell®** is of 2 years.



## DIMENSIONS



## INSURANCE

All Invent products are covered by RCP Insurance. Insurance also includes:

- wrong ideation, design, manufacturing;
- wrong, omitted or missing instruction of use;
- wrong or defected conservation;
- wrong or defected packaging.
- assembling and disassembling expenses.



## MODULE DATA

Module's Name	Q300	
Power class	Wp	300
Yearly module production*	kWh	360
Efficiency	%	18,09

## TECHNICAL DATA

Nominal tension	Vmp	32,2
Nominal power	A	9,31
No load voltage	Voc	39,6
Short-circuit current	A(Isc)	9,46
Full load voltage	V	1.000
Short-circuit current's temperature coefficient ( $\alpha$ )	Pm	4,60 mA/°C
No load voltage's temperature coefficient ( $\beta$ )	Vo	-0,132 V/°C
Power's temperature coefficient ( $\gamma$ )	Voc	-1,021 W/°C
<b>Power tolerance</b>		<b>0/+3%</b>
<b>NMOT</b>		<b>45,10°C</b>

Values obtained under standard conditions: 1,000 W/m – 25° C – AM 1.5

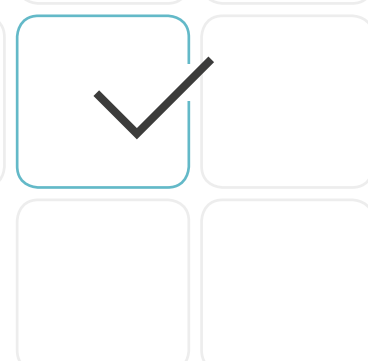
\* Calculated based on the production of the photovoltaic modules in the North of Italy with optimal orientation/inclination estimating a value equal to 1.200 kWh/kWp

# CERTIFICATIONS |

Invent photovoltaic modules are certified according to the European standard **CEI EN 61215-1: 2017, CEI EN 61215-2: 2017, CEI EN 61215-1-1: 2016.**

Safety tests were performed according to **CEI EN 61730-1: 2018, CEI EN 61730-2: 2018, IEC 61730-1: 2016, IEC 61730-2: 2016, EN 61730-1: 2018, EN 61730-2: 2018.**

In the laboratory the modules successfully pass all tests demonstrating high resistance to different types of stress.



CEI EN 61215 (2017)

### Hail resistance test

ice ball of 25mm launched at a speed of 23,0 m/s-1 directed to 11 points of impact.

In addition, a simulation of an impact with energy equal to a ice ball of 30 mm of diameter was made.



CEI EN 61215 (2017)

### Damp heat test

the module is put into operation with an ambient temperature of 85°C and relative humidity of 85%.



CEI EN 61215 (2017)

### Mechanical load test

the module is subjected to a pressure of 5400 Pa.

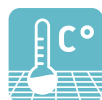
In addition, Invent tests the modules at a pressure of 7500Pa, that guarantees greater panel strenght.



CEI EN 61215 (2017)

### Moisture and freezing test

the module is put into service with an ambient temperature of - 45°C and relative humidity of 85%.



CEI EN 61730-2 (2018)

### Temperature test

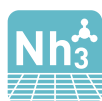
5 hours exposure to 1,000 Wm



CEI EN 61215 (2017)

### Thermal cycle test (50 and 200 cycles):

50 and 200 cycles from - 40°C to +85°C with the supply current peak.



IEC62716 (2013)

### Ammonia test



IEC61701 (2011)

### Salt spray test



IEC 60068-2-68

### Desert sand storm test

Ente Certificatore:



**WT Lab Srl**  
World Testing Lab



**alBARubens®**  
Albarubens division



# Invent<sup>®</sup>

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