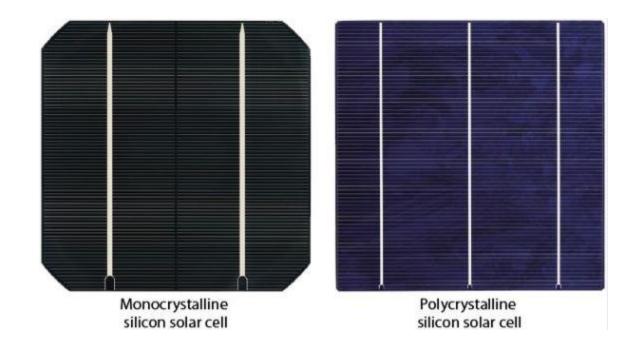
from A to Z...MONO vs poly



- A. Made in Germany
- B. Silicon purity
- c. Power (1660 x 990mm)
- D. Initial cost
- E. Transport cost
- F. Installation cost
- G. Space-Efficient
- н. Cells Peak
- . Cells Efficiency
- J. Electricity/sqm
- K. Electricity Losses
- L. Heat Resistance
- M. AR Glass
- N. EVA film
- LHS connectors
- P. Reduction of the STC efficiency from 1000W/m² to 200W/m²
- Q. Weak Light Behavior
- R. LID (Light Induced Degradation)
- s. 25 years Linear Warranty
- T. Free replacement module
- U. Free shipping modules for replacement
- v. Full compensation on tasks that fall in guarantee issues
- w. TOP PV BRAND in Germany and UK
- x. PID free
- Y. Carbon Footprint
- z. Aesthetic

from A to Z...MONO vs poly









A. Made in Germany





Τα πάνελ της aleo έρχονται με πιστοποίηση κατασκευής εργοστασίου από το Γερμανικό Βιομηχανικό Επιμελητήριο.

Σε ποιο εργοστάσιο κατασκευάστηκαν, με ποιο σειριακό αριθμό και πότε.

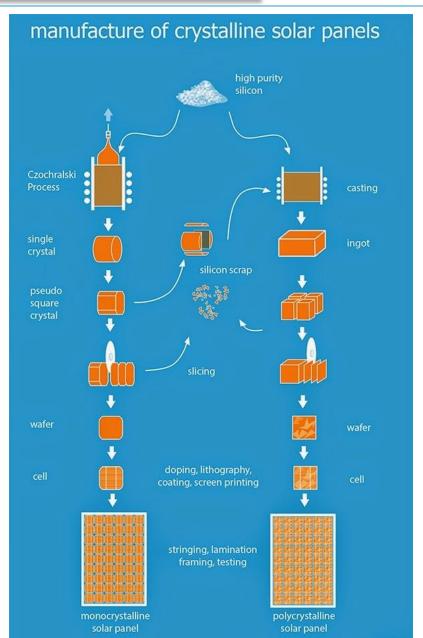


B. Silicon Purity



MonoHigh grade silicon purity

PolyLower silicon purity





Solar value chain









Silicon

Ingot

Wafer

Cell

Module

BoS

Συνεργασία με

BoS partners

D2D Sales

















Τεχνολογία Dss Multi-wire Cut

High Eff. Mono-cell Celco

900MW 850 MW παραγωγή παραγωγή στη Taiwan στη Taiwan

350 MW παραγωγή στη Taiwan

Premium Κατηγορία made in Germany

510 MW παραγωγή

στο Prenzlau

Εξουσιοδοτημένοι συνεργάτες

Πάνω από 2000 πελάτες παγκοσμίως

C. More power - same dimension





D. Initial cost



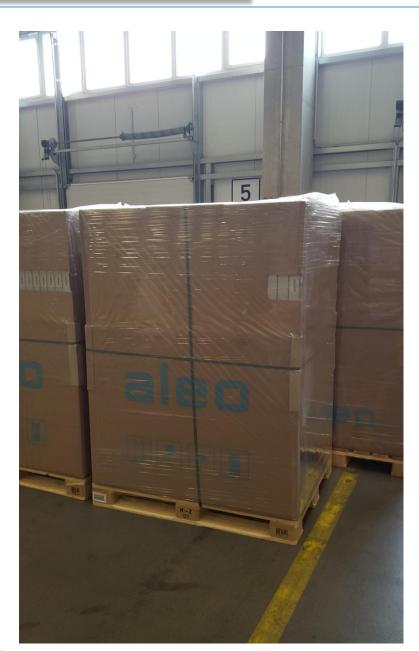
▶ Poly: 2.5 – 3.5% cheaper

E. Transportation cost



Mono
Up to 9kw/pallet

Poly
Up to 7,5kw/pallet



F-G. Installation cost / Space Efficient





- More installed total power in the same space
- Ability to increase the installed total power in the future
- Less Mounting Systems and rest materials,
- Less Installation effort,
- Less working hours,
- Reduced possibilities of a failure (statistic failure)
- Increased possibilities in replacing with the exact same power class module in the future



H-I-G-K-L. Cells Peak/Efficiency/ Electricity / Heat Resistance

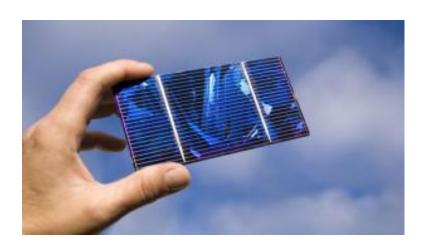


Monocrystalline cell



- Peak 5w
- Cell Efficiency 20,54%
- More Electricity/sqm
- Less Electricity Losses
- Temperature coefficient-0,40

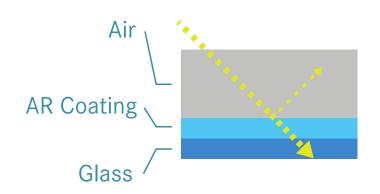
Polycrystalline cell

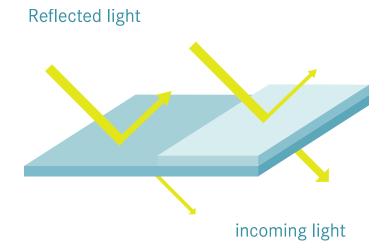


- Peak 4,16
- Cell Efficiency 17,1 %
- Less Electricity/sqm
- More Electricity Losses
- Temperature coefficient-0,43

M. AR Glass







Mono modules capture more light.

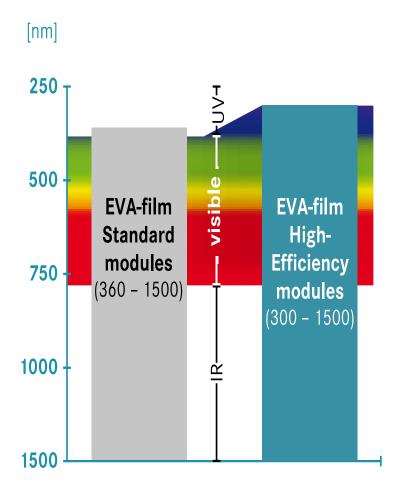
This is made possible by a thin film made of silicon dioxide, which covers the front glass. The thin silicon dioxide coat reduces the refractive index on the glass surface and consequently light reflection.

N. EVA film



 The highly transparent EVA film extend the transmitted radiation spectrum and enhance its transmission.

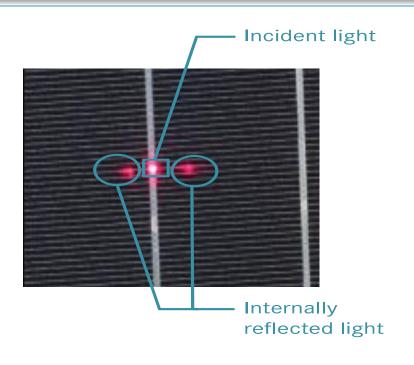
This process enables a **greater quantity of light** to get to the cells, passing through the film from the front side of the panel.

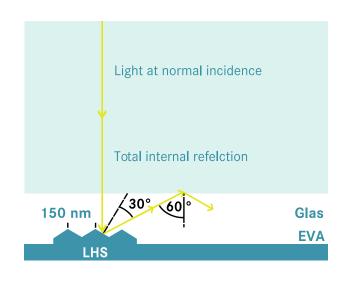


Better transparency in the UV spectrum

O. LHS Technology



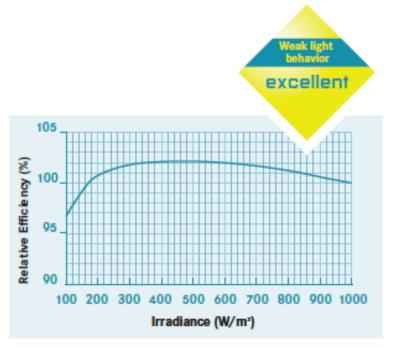




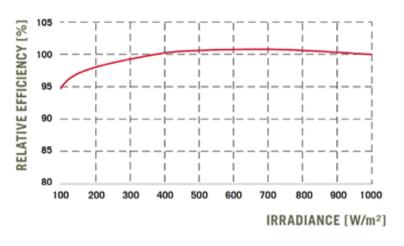
- Special cell interconnections, called "Light Harvesting String" (LHS) technology.
- It was first developed by the Massachusetts Institute of Technology (MIT) and directs more light to the cells.

P. Reduction of the STC efficiency





aleo mono module

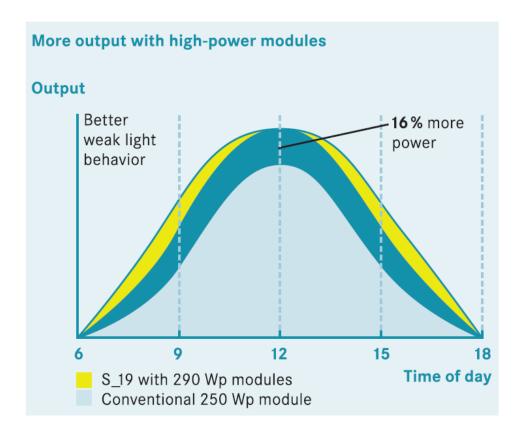


conventional Poly

- 0% of rel. reduction of the STC efficiency from 1000W/m² to 200W/m²
- While modules with conventional poly or mono crystalline cells usually suffer from efficiency losses between 2 and 5%, our modules even give an efficiency gain for 200 W/m² thereby ensuring high yield under real conditions.

Q. Weak light behavior

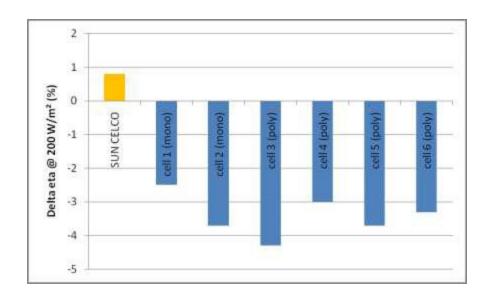




Higher yield under non ideal illumination conditions (under angle, morning, afternoon, cloudy weather etc.)

R. Light Induced Degradation (LID)

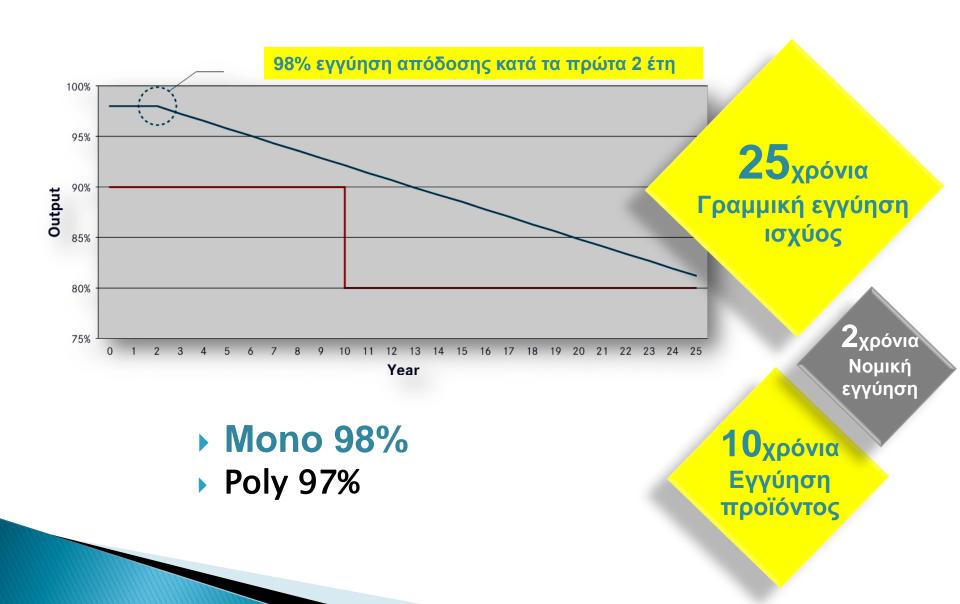




- During their first several weeks exposed to light, solar panels suffer from the so called light induced degradation process, which reduces the efficiency of the PV panels continually until they stabilize at a lower efficiency level. Usually, the reduction of conventional panels is as high as 1 to 4% of the initial power output after 50 kWh.
- aleo Monocrystalline series show a minor degradation effect only about 0.6%.

S. Linear Power Warranty





T-U-V. Guarantee reimbursement



Immediate and free replacement module

Full compensation on tasks that fall in guarantee issues

for also modules

also point remoit provides: a product guarantee and a power only the guarantee for tits photovoiside modules. The product apply guarantee covers defects of the module (A.1.) while the These guarantee usubject of the power guarantee is only the module's loss of warehousing, output due to ordinary cell aging (degradation) (A.2.). Sections maintenance of

 aleo-Product Guarantee
 Subject to the conditions of this guarantee certificate, the guarantee that sheemodule: shall be free from defects for a linear guarantee that sheemodule: shall be free from defects for a linear guarantee that sheemodule: shall be free from defects for a linear guarantee that sheemodule: shall be free from defects for a linear guarantee that sheemodule: shall be free from defects for a linear guarantee same only effective for module used under period of 10 years from the purchase date. Power output is normal climate conditions. They do not apply in the event of

- will be less than 0,73% of the power output of the lilegible, or otherwise become illegible

system in which it was initially integrated. Guarantee claims must be filed within the applicable guarantee period.

The guarantees are valid in the European Union or in the country in which the also solar group first placed the module

the version which is up to date at the time of installation mus

impairments or damage to the modules due to current surges, lightning, flooding, vernin, fire, breakage, undue shock or similar external influences.

modules and over which we have no influence. Furthermore puring the lists two years from the purchase date, the models and over whom we have no intellecte. Furthermore, monoco-cytalline cells and 97% for models using monoco-cytalline cells and 97% for models using systems. A defect does not exist in the case of mere optical poly-cytalline cells and 97% for models suited by systems. A defect does not exist in the case of mere optical experiments of the models that do not fundamentally influence the technical function of the modules. These the annual performance degradation in the guarantees are no longer valid if the module label or serial number of the module have been changed, erased, or made

power output of the modules shall be measured under in the event a binding gazantee claim has been reasonable text conditions (DTC) and under consideration of we shall provide, at our sole discretion, compensation in the dard measurement blearance.

If the event a binding gazantee claim has been made of the wear and the conditions of the conditions of the shall be presented to product (new or refurshized) in the conditions of the conditions

- The owner of the module at the time at which a guarantee c) for aleo-Product Guarantee cases only provision of financial compensation for th
 - appropriate residual value of the products aleo-Power Guarantee cases only provision of additional modules (new or refu which makes it possible to re-establish the guaranteed power output, or



Direct and free shipping modules for replacement

W. Top Brand PV for 2015







EuPD Research and the Hoehner Research & Consulting Group

The company aleo solar ranks among the top PV brands in Germany and UK according to the results of a survey carried out by EuPD Research among installers on brand awareness, customers' choice and distribution.





Combination of thoroughly qualified cells, glass, and embedding materials.

PID-free upon application of a negative bias of 1000V (maximum system voltage) for 96h at 60°C and 85% relative humidity. Tests were performed at Fraunhofer ISE (11/2014).

PID affects mainly Poly modules.

No PID problem has been record in aleo Mono modules.

Y. Low Carbon Footprint



In **10months** our modules are completely neutral and in about 20 years you'll save 5 Tons CO₂*

The term "Carbon Footprint" means a certain amount of gaseous emissions (CO₂) produced by human activities or cumulated over the life cycle of a product.



215Kg CO₂ eq



*depending from module type and location of the module

Z. Aesthetics





from A to Z...MONO vs poly



	Basic topics	Mono	Poly
a.	Made in Germany	٧	V
b.	Silicon purity	٧	-
c.	Power (1660 x 990mm)	V	-
d.	Initial cost	-	٧
e.	Transport cost	V	-
f.	Installation cost	V	-
g.	Space-Efficient	٧	-
h.	Cells Peak	V	-
i.	Cell efficiency	V	-
j.	Electricity/sqm	V	-
k.	Electricity Loss	V	-
١.	Heat Resistance	V	-
m.	AR Glass	V	-
n.	EVA film	V	-
ο.	LHS connectors	V	-
p.	Reduction of the STC efficiency from 1000W/m²	V	-
q.	Weak light behaviour	V	-
r.	LID (Light Induced Degradation)	V	-
s.	25 years Linear Warranty	V	٧
t.	Free replacement module	V	٧
u.	Free shipping modules for replacement	V	٧
٧.	Full compensation on tasks that fall in	٧	V
w.	TOP PV BRAND in Germany and UK	٧	V
х.	PID free	٧	V
у.	Carbon Footprint	٧	V
Z.	Aesthetic	٧	-