



Concentrating
Photo
Voltaic



Alubond
PV **Booster Mirror**

Solar Made Simple...

Alubond U.S.A

PV Booster Mirror

About Us

Mulk Enpar R.E has diversified in renewable energy sector with a strong presence in solar energy products for a wide variety of applications in industrial and domestic arena. The company caters the needs of the global market and has established channel partners in over 80 countries. The company is today widely diversified with a strong presence in a solar energy, Energy saving lighting systems and various other solar powered solutions.

On Grid Platform with Booster Mirror

On Grid Home Systems



On Grid Solar Field



Off Grid PV System with Booster Mirror

Off Grid Home System



Off Grid Lighting



On Grid



On Grid Solar Field



On Grid + Tracker System



Off Grid PV Hospitals



Off Grid Telecom



Solar PV Platform (SPVP)

Mulk Enpar Renewable Energy's "SOLAR PV PLATFORM" (Patented in USA and Worldwide) is invented, designed and developed in the USA by Mulk Enpar R.E's Khurram Khan Nawab. Mulk Enpar Renewable Energy's "SPVP" is an innovative tracking system for photovoltaic installations which is fully automatic and controlled by sensors and GPS which tracks the sun movements and ensures maximum power yield from photovoltaic installation worldwide. SPVP, with its efficient mechanical system and most reliable installation concept design guarantees the highest energy yields from photovoltaic all year round which results in outstanding price - performance ratio, high return on investment and thereby making it one of the most unique and cost effective tracking system available today.

SPVP Advantages:

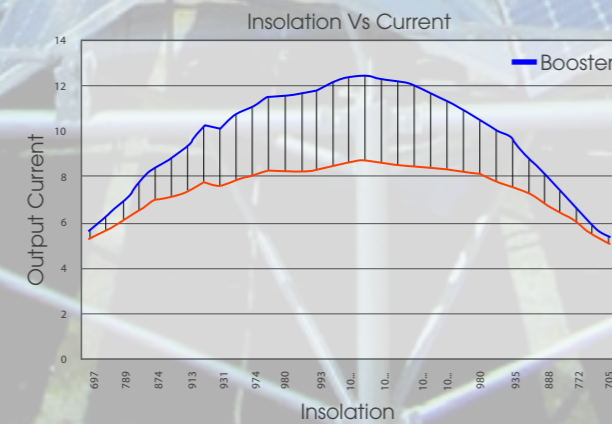
- Less cost
- High energy yield
- Simple and easy installation design
- Accurate tracking using precise sensors
- Reduced land requirements for the overall project installations
- No maintenance required
- Fully automatic

ABTI USA PV Tracking System

Performance Boost Yield

PV Modules + Alubond PV Booster Mirror + SPVP

- Over 50% more power output in summer
- Over 70% more power in winter



PV Module Tested - 225 Watts Peak
 Blue Curve (With Mirror) - 403 Watts Peak
 Red Curve (Without Mirror) - 280 Watts Peak

Alubond PV Booster Mirror



Khurram Khan Nawab

Photovoltaic (PV) devices have been in existence for several years and the electricity generated by them has been costly in comparison to conventional energy. This problem has been compounded by the shortage of solar grade Silicon which has become expensive.

A solution to this problem was found by developing specialized solar PV reflectors which enable the solar radiation to be concentrated onto a smaller geometric area of Silicon while still producing the desired level of power.

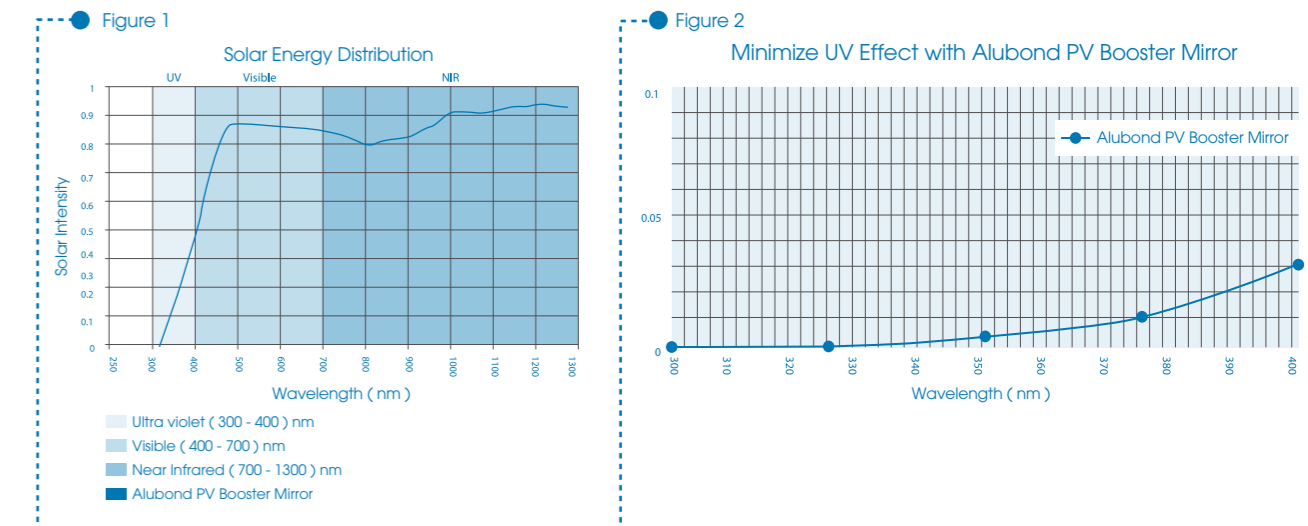
Alubond "PV Booster Mirror" (Patented in USA and Worldwide) is invented, designed and developed in the USA by Mulk R.E's Khurram Khan Nawab. The Alubond PV Booster Mirror reflects the solar flux on to the silicon wafer channelling it into a PV Module which increases their electrical output, while protecting it from the burnout effect which is a serious and frequent issue with PV Module concentrators that result in reducing the life of the PV cells.

Alubond PV Booster Mirror provides a cumulative effect on the photovoltaic panel which will enhance the power output without comprising the durability of the PV Panel.

Alubond UV Protection

Alubond PV Booster Mirror is a reflective metal mirror for photovoltaic (PV) devices which increases the electrical output of the PV panel and cuts out the UV range of radiations in the solar spectrum that causes panel ageing and overheating as shown in figure 1 & 2.

The new surface maintains high uniform reflectivity at visible and NIR wavelength.



Alubond PV Booster Mirror

Data Table - 225 WP With Mirror & Without Mirror
(Both options with Tracking)

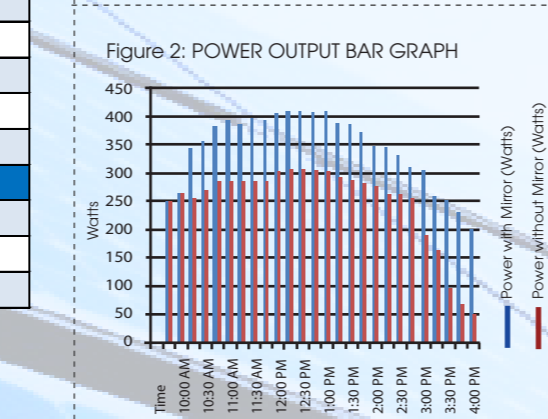
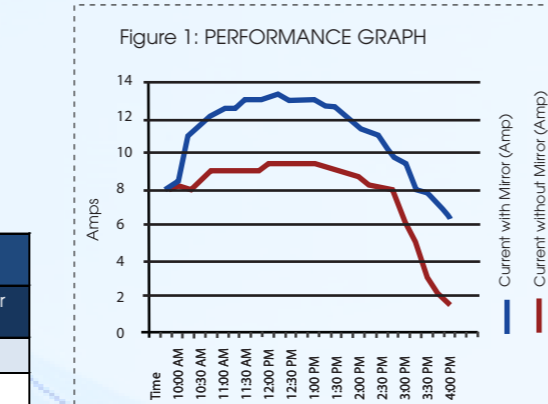
Time	Insolation Vs Time	225 WP MODULE / WITH MIRROR / WITH TRACKING			225 WP MODULE / WITH OUT MIRROR / WITH TRACKING		
		Voltage (V)	Current with mirror (Amp)	Power with mirror (W)	Voltage (V)	Current without mirror (Amp)	Power without mirror (W)
10:30 AM	802	30.8	11.5	354.2	31.85	8.5	270.725
10:45 AM	809	31.6	12.2	385.52	31.85	9	286.65
11:00 AM	810	31.3	12.5	391.25	31.5	9	283.5
11:15 AM	830	30.95	12.5	386.875	31.95	9	287.55
11:30 AM	843	30.53	13	396.89	31.8	9	286.2
11:45 AM	851	30.25	13	393.25	31.8	9	286.2
12:00 PM	832	30.97	13.2	408.804	31.8	9	286.2
12:15 PM	852	30.9	13.3	410.97	32.05	9.5	304.475
12:30 PM	851	31.5	13	409.5	32.05	9.5	304.475
12:45 PM	852	31.35	13	407.55	32.1	9.5	304.95
1:00 PM	830	31.5	13	409.5	31.6	9.5	300.2

Table 1 : At 12 :15 pm a max current of 13.3 Amp is achieved with using mirror giving a max power of 410.97 Watts

Hydrophilic Effect

Alubond PV Booster Mirror has a special innovative coating which uses Hydrophilic Principles in which the physical property of a molecule repels from a mass of water. This was observed when water was placed on the Alubond PV Booster Mirror, water did not form droplets but instead fully wets the mirrors to have self cleaning effects.

To study the effect of this aspect on solar system performance, samples were mounted on a rack outside on a clear night. The next morning, observations were made. As shown in figure 3 and 4, Alubond PV Booster Mirror hydrophilic samples appeared to be visually clear.



ABTI USA PV Modules



ABTI PV 12/80 ABTI PV 12/120 ABTI PV 24/160 ABTI PV 24/210 ABTI PV 24/225 ABTI PV 24/280

Module Type	ABTI PV 12/80
PM (WP)	80
VMPP (V)	17.3
IMPP (A)	4.63
VOC (V)	21.6
ISC (A)	5.14
SIZE (MM) L/W/D	950 x 670 x 35
WEIGHT (KG)	7.5

Module Type	ABTI PV 24/210
PM (WP)	210
VMPP (V)	27.1
IMPP (A)	7.75
VOC (V)	33.4
ISC (A)	8.4
SIZE (MM) L/W/D	1480 x 992 x 46
WEIGHT (KG)	18

Module Type	ABTI PV 12/120
PM (WP)	120
VMPP (V)	17.3
IMPP (A)	6.94
VOC (V)	21.6
ISC (A)	7.71
SIZE (MM) L/W/D	1380 x 670 x 40
WEIGHT (KG)	11.1

Module Type	ABTI PV 24/225
PM (WP)	225
VMPP (V)	30.12
IMPP (A)	8.18
VOC (V)	35.94
ISC (A)	8.18
SIZE (MM) L/W/D	1660 x 990 x 46
WEIGHT (KG)	19.5

Module Type	ABTI PV 24/160
PM (WP)	160
VMPP (V)	25.2
IMPP (A)	6.63
VOC (V)	31.3
ISC (A)	7.20
SIZE (MM) L/W/D	1480 x 992 x 46
WEIGHT (KG)	18

Module Type	ABTI PV 24/280
PM (WP)	280
VMPP (V)	31.08
IMPP (A)	8.38
VOC (V)	36.48
ISC (A)	8.38
SIZE (MM) L/W/D	1380 x 670 x 40
WEIGHT (KG)	20



A Break Through in CPV Technology
Low Cost & High Output

Mulk Enpar Renewable Energy

Post Box No. 50879
Hamriya Freezone, Sharjah
United Arab Emirates
Tel : +971 - 6 - 5262202
Fax : +971 - 6 - 5262203

pv@mulkre.com



Total CPV Solution

- Design
- Manufacturing
- Fabrication
- Installation
- Operation
- Maintenance

OFF Grid - ON Grid - Others

www.mulkre.com