



Schools & Homes Energy Education Project Ltd.

Solar Active

84 Upper Valley Road
Sheffield S8 9HE Tel/fax: 0114 258 7639
enquiries@solar-active.com www.solar-active.com
Charity No.1073347 – Company No. 3273416

Solar-Active Flexible PV Cells Characterisation and Performance

Introduction

The heart of the Solar-Active flexible photovoltaic cell is the triple junction amorphous silicon alloy solar cell. Each solar cell is composed of three semiconductor junctions stacked on top of each other. The bottom cell absorbs the red light; the middle cell absorbs the green light and the top cell absorbs the blue light. This spectrum splitting capability results in the highest active area efficiency (13.0% stable) of any commercially available thin-film technology. [re:- <http://original.solar-active.com/xous.pvtec4.doc>]

Data

- Flexible, durable, light-weight and waterproof
- Responds to defuse light on a cloudy/rainy day
 - Generates useful output in partial shading or diffuse light conditions
- SINGLE CELL: 14g – 40mmX180mmX 1mm; Output: 300mA & 1.5V. [figures are accurate to +/- 10%]
- DOUBLE CELL [When two cells are connected in series a bypass diode is soldered between the two cells.] 56g – 105mmX218mmX1mm; Output: 300mA, 3.0V. [figures are accurate to +/- 10%]
- After lamination 'pinch terminals' are soldered on the negative and positive terminals for easy use. On request we can omit this step.
- Tests indicate that there is no problem using the cells outdoors.
- Triple junction structure allows 11 cells connected in series to make a 12 volt module. The voltage drop/cell is sufficiently high to enable cell bypass diodes to be used.
- Note: A teacher in Denmark connected 17 double cells to power a TV.

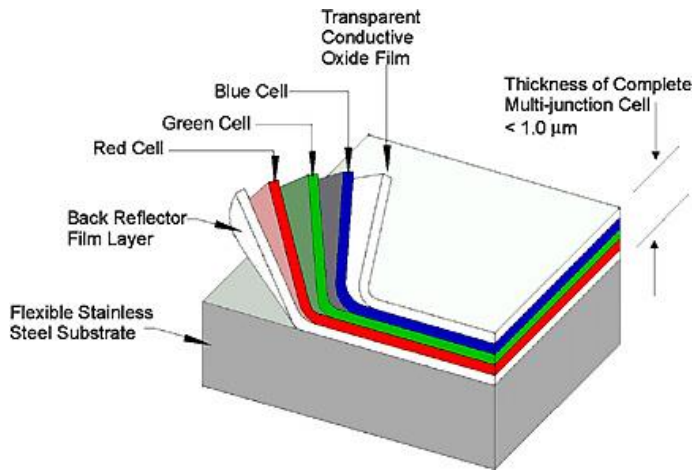
Encapsulation/Lamination



SINGLE CELL: FRONT ON LEFT & BACK ON RIGHT - PINCH TERMINALS

We have recently put into production a new encapsulation process, dipping the cell in a water based protective conformal coating. The method also involves placing on the back of the cell, over the protective coating, a double sided yellow in colour thin foam adhesive tape that adds a degree of rigidity to the cell.

The customer has the option to remove the back layer of protective tape and place cell on a more rigid backing. The double Solar-Active cell is covered in a clear layer laminate of Tedlar front and back. These laminates protects the cell from damage when in use.



Spectrum-splitting cell, constructed of three separate p-i-n type, amorphous semiconductor solar sub-cells, each with a different spectral response characteristic. In this way, the cell can convert the different visible and near infrared wavelengths of sunlight with optimal efficiency.