:· News Release

[New Product] September 2, 2010

Commercialization and the Start of Mass Production of the SP100 Series, Solar Cell Conductive Film Capable of Making Strings at Low Temperature for Photovoltaic Modules

NEWS_no 10-004

Sony Chemical & Information Device Corporation commercialized and commenced full-scale mass production of the SP100 Series, Solar Cell Conductive Film for photovoltaic modules in April 2010. The SP100 Series is a film-type conductive bonding material that bonds the solar cell with the metal ribbon that acts as a transmission line for electricity generated by the cell and, compared with conventional soldering (200°C or more), is capable of low-temperature bonding at 180°C, enabling significant reductions in residual stress after bonding on cells, thereby contributing to improved yield during module production. In addition, the SP100 Series is also capable of bonding thin cells (approximately 150μm) that are weaker against thermal stress during soldering than standard thick cells. Free of materials that may impact on the environment such as flux and lead, the SP100 Series has been designed with the aim of alleviating the environmental impact after disposal.

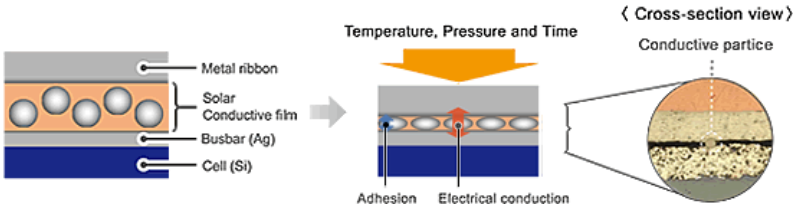
■ Main Features of Solar Cell Conductive Film SP100 Series

Solar cell strings, which compose photovoltaic modules, are generally bonded by soldering which requires heating to a temperature of 200°C or higher. Differences in the thermal and mechanical characteristics of the silicon used in cells and metal ribbon (generally solder-coated copper wire) cause residual stress around the bonding area, leading to problems such as cell breakage after bonding.

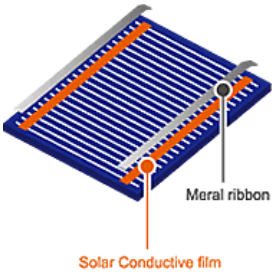
Sony Chemical & Information Device's SP100 Series is a bonding material that uses Anisotropic Conductive Film (ACF) technology utilized for applications such as the mounting of a driver IC on an LCD panel. The SP100 series makes stable contact between the solar cell and metal ribbon by heating and pressurizing conductive particles distributed evenly into the epoxy-type resin, resulting in heat-curing of the resin simultaneously, so the material provides reliable conduction equivalent to that provided by soldering. In addition, because the material is a film type, there is no dispersal of material to the light receiving area, resulting in a module with beautifully finished bonded areas. Moreover, the material is suitable for narrow areas, capable of usage at widths as small as approximately 1mm, making it possible to ensure a wide light-receiving area by reducing the busbar width.

The SP100 Series is not only features a bonding mechanism that renders the melting of solder unnecessary, but also is a bonding material with minimal impact on the environment thanks to the absence of constituents such as flux and Pb. This bonding material is compatible with Pb-free solder-type ribbons and contributes to the production of modules that are even more environmentally-friendly.

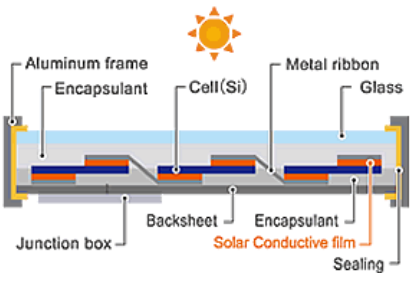
<Activation mechanism>



<Metal ribbon connection>



<Cross-section diagram of cell>

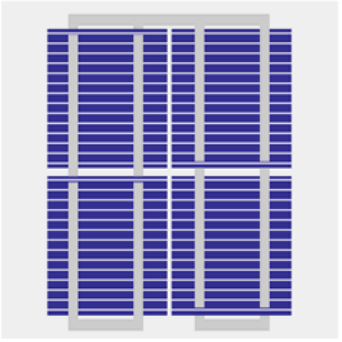


■ Guarantee of Long-term Conduction Reliability required by Photovoltaic Modules

The SP100 Series has been evaluated by the Consortium for Development and Assessment of Highly-reliable Photovoltaic Modules of the Advanced Industrial Science and Technology (AIST) and modules using the SP100 Series have passed high-temperature / high-humidity testing (85°C / 85%RH, 1000 hours) and temperature cycle testing (-40°C – 85°C, 200 cycles) regulated by IEC61215, an international module accreditation standard, and it has been verified that the product provides the long-term conduction reliability required by photovoltaic modules.

<Reliability>

Test Vehicle



Module specification
- Dimension : W407mm × L407mm
- Cell : 4 cells (2×2)
- Glass : Tempered glass
- Encapsulant : EVA (Fast-cure type)
- Backsheet : TPT

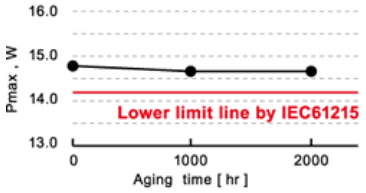
Cell specification
- Type : Multi-crystalline
- Size : 6 inch × 0.18mm²

Conductive film specification
- Model No. : SP102F1
- Film width : 1.5mm

Metal ribbon specification
- Width : 2mm
- Thickness : 0.24mm

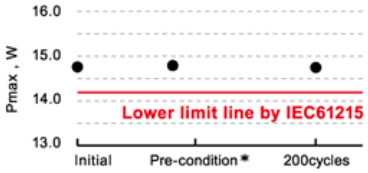
Bonding condition : 180℃@2MPa-15sec

Damp heat test: 85°C / 85%RH



Measurement AM1.5, 1000W/m², 25°C±1°C

Thermal cycle test: -40°C to 85°C



* Pre-condition
Thermal cycle test was tested after following aging test
Test1 : Thermal cycle test -40°C to 85°C, 50cycles
Test2 : Humidity freeze test -40°C to 85°C/85%RH, 10cycles

These results were obtained by "Consortium Study on Fabrication and Characterization of Solar Cell Modules with Long Life and High Reliability" at National Institute of Advanced Industrial Science and Technology (AIST) Research Center for Photovoltaic.

<Specifications>

Dimension	Width	1.0, 1.2, 1.5mm	
	Length	300m	
	Thickness	Approx.25μm	
Adhesive	Material	Epoxy resin	
Conductive particle	Material	Nickel	
	Particle size	Approx.10μm	
Conductive film Lamination conditions	Temperature(°C)*1	60 to 90	
	Pressure(MPa)*2	0.2 to 0.3	
	Time(sec)*3	0.5 to 3.0	
Main bonding conditions	Temperature(°C)*1	180	200
	Pressure(MPa)*4	2	2
	Time(sec)*3	10	5

*1 Temperature of conductive film lamination and main bonding: It is not equipment temperature, but temperature of conductive film.
*2 Pressure of conductive film lamination: It is discribed as the area of conductive film lamination.
*3 Time of conductive film lamination and main bonding: Time from the start of bonding to the point where the temperature reaches the target.
*4 Pressure of main bonding: The pressure of main bonding is discribed as the bonding area.
※Connecting conditions may differ depending on cell size and cell thickness.

The SP200 Series, a product capable of bonding at even lower temperatures (160°C) and the metal-ribbon-integrated DT100 Series are scheduled to be exhibited at the 25th European Photovoltaic Solar Energy Conference and Exhibition (25th EU PVSEC) to be held at the Feria Valencia in Spain from September 6 (Monday) to 10 (Friday) this year.

■ Company Profile

Sony Chemical & Information Device Corporation
Representative: Takashi Ichinose, Representative Director and President
Headquarters: Gate City Osaki, East Tower 8th Floor, 1-11-2 Osaki, Shinagawa-ku, Tokyo, Japan
Principal operations: Manufacturing and sales of electronics parts, adhesive materials and optical materials, manufacturing of magnetic disks, magnetic devices, print media and LAMINATE

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