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Japanese

World Topics

Sharp Develops Solar Cell with World's Highest Conversion Efficiency*¹ of 36.9%*²



On November 4, 2011, Sharp Corporation held a press event in Tokyo to announce that it has achieved the world's highest solar cell conversion efficiency*¹ of 36.9%*² using a triple-junction compound solar cell in which the solar cell has a stacked three-layer structure.

Compound solar cells utilize photo-absorption layers made from compounds consisting of two or more elements, such as indium and gallium. Because of their high conversion efficiency, compound solar cells have been used primarily on space satellites.

Since 2000, Sharp has been pursuing research and development of a triple-junction compound solar cell that achieves high conversion efficiency by stacking three photo-absorption layers. In 2009, Sharp succeeded in improving cell conversion efficiency to 35.8% based on proprietary technology that enabled efficient fabrication of a stacked triple-layer structure with InGaAs (indium gallium arsenide) as the bottom layer. This latest increase in conversion efficiency was achieved by improving the maximum power output of the solar cell by reducing the resistance of the junction areas necessary to connect the solar cell layers in series.

Sharp achieved this latest breakthrough as a result of a research and development initiative promoted by Japan's New Energy and Industrial Technology Development Organization (NEDO)*³ on the theme of "R&D on Innovative Solar Cells." Measurement of the value of 36.9%, which sets a new record for the world's highest non-concentrating conversion efficiency, was confirmed at the National Institute of Advanced Industrial Science and Technology (AIST).

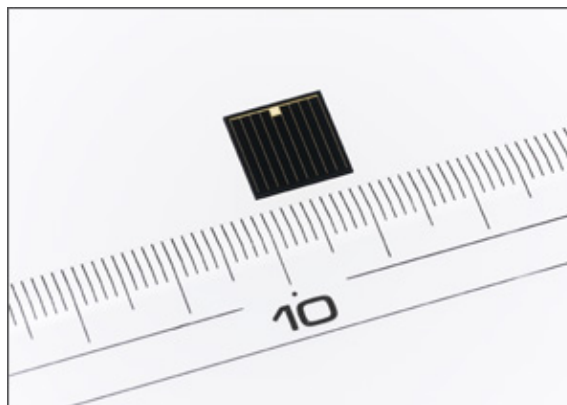
At the press event, Sharp explained in detail this new triple-junction compound solar cell and its future developments as well as introduced Sharp's solar cell R&D history and the basic features of thin-film solar cells.



A scene from the press event



Hiroshi Morimoto, Executive Officer, Group General Manager, Solar Systems Development Group



Triple-junction compound solar cell with the world's highest conversion efficiency of 36.9%



*1 As of November 4, 2011, for non-concentrator solar cells at the research level (based on Sharp survey).

*2 Conversion efficiency confirmed by the National Institute of Advanced Industrial Science and Technology (AIST; one of the organizations around the world that officially certifies energy conversion efficiency measurements in solar cells) in September 2011. (Cell surface: approx. 1 cm²)

*3 The New Energy and Industrial Technology Development Organization (NEDO) is Japan's public management organization for promoting research and development as well as for disseminating industrial, energy, and environmental technologies.

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