SHARP®

solar electricity

UTILITY-SCALE POWER: IMPROVING YOUR BOTTOM LINE FROM 93 MILLION MILES AWAY.

BECOME POWERFUL

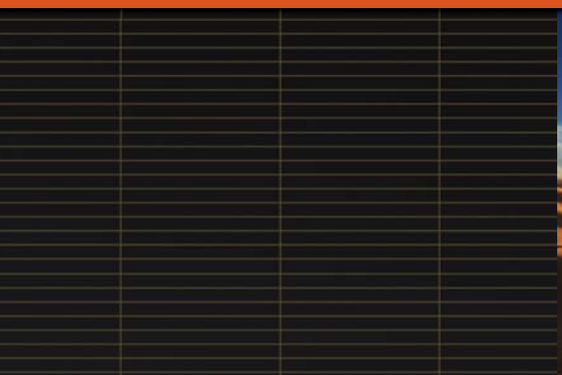
THE PRODUCT OF CHOICE FOR MULTI-MEGAWATT SCALE POWER PRODUCTION.

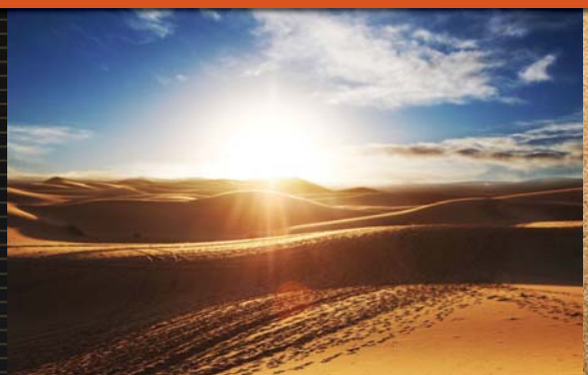
Sharp's thin film product pairs amorphous silicon with a layer of Sharp's proprietary microcrystalline silicon to achieve higher stability and better performance than previously thought possible for thin film solar. This tandem-junction architecture captures more of the solar spectrum and converts more sunlight into electricity. It is produced with less than one percent of the silicon used in crystalline solar cells, creating a less material-intensive manufacturing process that contributes to a lower effective cost per kilowatt hour (kWh) for large-scale applications. Additionally, with a low temperature coefficient for output power – approximately half that of crystalline silicon – thin film generates greater specific power than its crystalline silicon counterpart in geographic regions where temperatures are high. In warm climates, this translates into as much as 10 percent more kilowatt-hours per kilowatt.

Proprietary design increases reliability by minimizing losses caused by module output variation.

Favorable temperature coefficient enables high performance in warm climates.

First to introduce the microamorphos tandem cell, Sharp uses only abundant, environmentally-kind materials that are readily available.





SHARP: THE FIRST NAME IN SOLAR POWER. THE FINAL WORD IN SOLAR INNOVATION.

Since 1963, Sharp has led the solar electric industry with efficient, affordable systems and powers more homes and businesses than any other solar manufacturer in the world. Today, we offer a vast portfolio of proven solar solutions, including monocrystalline and polycrystalline silicon and our newest innovation, tandem-junction thin film silicon.

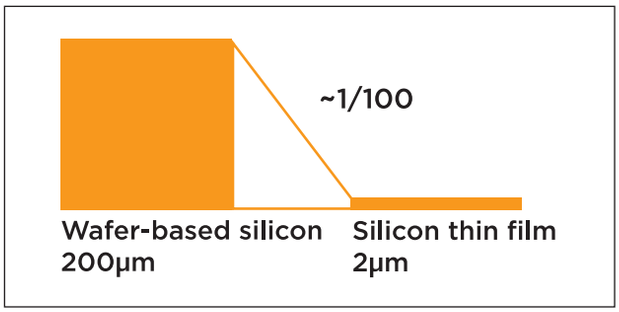
Thin film photovoltaics: The next evolution of solar technology.

For nearly 50 years, Sharp has consistently brought down the cost of solar electricity through design and manufacturing efficiencies. Our selection of environmentally abundant and benign silicon as the basic semiconductor springs from our exceptional knowledge of silicon thin films, based in part on our world-leading LCD technology and scientific knowledgebase, access to abundant raw material, environmentally friendly manufacturing and performance relative to other thin-film semiconductors. Thin film is our technology roadmap in achieving a lower cost per kilowatt-hour.

Efficiency, performance and installation-ease combine for greater savings.

Sharp's thin film is designed for lower cost installation and better system performance. Starting at 115 watts (and increasing from there), the installation of a thin film array saves on time and labor costs – fewer modules are needed for the system, as are fewer installation hardware components as compared to modules with lower power output.

Thin Film Solar: Higher Performance, Lower Cost



Sharp thin film modules are made with a fraction of the silicon used in our crystalline lines and are manufactured using automated equipment in fewer steps. This means a step-function change in cost per watt and a lower effective cost per kilowatt hour for large-scale applications.

USING OUR EXPERIENCE TO MAKE THE WORLD A BETTER PLACE.

Imagine a world where advances in technology come without sacrificing the environment. A world where new products not only save energy, they create energy. At Sharp, our passion for protecting the eco-system for future generations is equaled by our enthusiasm for improving the lives of people today. Sharp is committed to a higher level of standards for energy efficiency and environmental sustainability, working to minimize waste and greenhouse gases in all Sharp factories.

A production facility befitting an environmentally advanced company, the Kameyama LCD Plant features one of the world's largest roof-mounted solar systems, creating enough electricity to power approximately 1,300 homes.

- All Sharp manufacturing plants worldwide are ISO 14001 certified for environmental compliance.
- Kameyama No. 2 plant is the world's most environmentally advanced LCD factory, featuring one of the world's largest rooftop solar electric systems, fuel cell technology, water recycling, and reduction of waste, harmful chemicals and greenhouse gas emissions.
- The Sakai City manufacturing complex will feature the same environmentally advanced measures, and will be capable of producing enough thin film solar every year to fulfill the electricity needs of a quarter million homes.
- Sharp is an award-winning member of the EPA's SmartWay™ Transport Partnership. This alliance established guidelines for fuel efficiency improvements to reduce greenhouse gasses by limiting unnecessary engine idling and increasing the use of rail and intermodal transportation.

SmartWay℠ Transport Partner
Getting There With Cleaner Air

www.SharpUSA.com/solar
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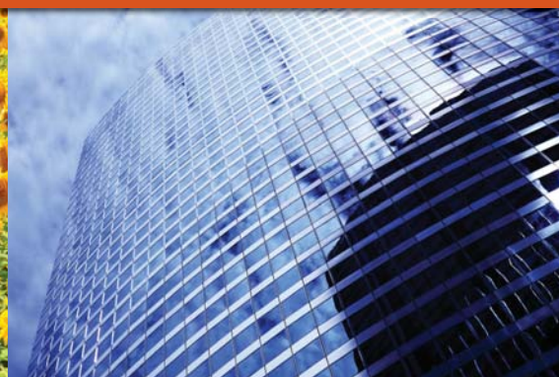
COMMITTED TO PEOPLE AND OUR PLANET.

Since the 1990s, Sharp's "Super Green Strategy" has established environmentally sustainable domestic and overseas manufacturing systems and maintained the corporation's position as a leader in manufacturing. This strategy is an effort aimed at bringing the ultimate in environmental consciousness to all corporate activities, giving priority to five critical areas: management, technologies, products and devices, factories, and recycling. These aspects are continually monitored, controlled and scored against stringent environmental performance objectives. Factories must achieve exceptionally high scores to garner the internal award of "Super Green" status. But Sharp's efforts to minimize environmental impact don't begin and end with manufacturing. We continually focus on improving conservation technologies and programs in the packaging, transportation, use and eventual safe disposal of our products.

Eco-friendly design: Single-layer glass with polymeric backskin lowers pounds per watt and transportation costs.

Sharp has been recognized by the EPA for collecting and safely recycling used electronic equipment.

Sharp extends its industry leadership, encouraging other organizations to go beyond their legal environmental requirements.



COMMITTED TO MAKING A WIDE IMPACT WITH THIN FILM.

As we prepare to serve the emerging market for utility-scale solar power, Sharp continues to advance technology and manufacturing capacity. Already, capacity at our Katsuragi plant has reached 160 megawatts of thin film modules per year, and completion of the world's largest thin film manufacturing complex at our Sakai City factory, eventually capable of one gigawatt of thin film production per year, is expected in 2010. The integrated complex, which also houses a state-of-the-art Liquid Crystal Display (LCD) panel factory, allows Sharp to leverage manufacturing competency with a similar technology and key supply chain partners to efficiently and reliably manufacture thin film solar modules. And this gigawatt-scale factory is only the first to come.

14,100 Sharp amorphous silicon thin film modules power a 1.63 MW array in Viernau, Germany.

BECOME POWERFUL WITH SHARP.

From research and development, to system design, delivery, deployment and customer service, Sharp's products and services strive to be best in class. As a multi-billion dollar, global enterprise with a 100-year-old heritage, Sharp stands behind its products with solid warranties and an unyielding commitment to quality control, manufacturing expertise, global leadership, expansion and continuous manufacturing innovation.

Sakai City manufacturing plant: world's largest thin film factory, opening in 2010.

1.0 MW thin film installation in Munich, Germany.

We look forward to partnering with you to build a more sustainable society.

BECOME POWERFUL

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