

SoloOptics
Company Overview



SOLOOPTICS

www.solooptics.com



SoloOptics develops optical components and systems relevant to the solar industry. We offer patent-pending and groundbreaking technologies in both photovoltaics (PV) and concentrating solar thermal (CSP). All promise step change performance improvements across efficiency, cost, scalability, and ease of deployment.

- ▶ SoloOptics is a division of Genie Lens Technologies, LLC
- ▶ Genie Lens is a leading specialist in innovative applied optics and light ray management solutions
- ▶ Our applications span two main categories:
 - **Imaging** (the manipulation of light for the projection of visual images in applications such as brand enhancement, security and authentication)
 - **Non-Imaging** (the manipulation of light for concentration and illumination in applications such as solar energy generation, desalination, steam generation and water purification)
- ▶ We currently sell and license our technology in a broad array of industries, including consumer goods, electronics, financial services, healthcare/pharmaceuticals, energy, and government
- ▶ Genie Lens internally developed and wholly owns patent-pending proprietary light ray tracing software that allows us to leapfrog competition by significantly expediting innovation and reducing iterative development costs



For decades, the solar industry has been struggling to make the collection and distribution of solar energy more efficient, more scalable and more affordable. Now, with development of our patent pending applications, SolOptics is on the brink of facilitating a dramatic, industry-wide transformation.

SOLOPTICS FUSION

PV Efficiency Enhancement

Fusion is a patent-pending surface technology consisting of micro-lenses embossed in either glass or thin plastic film that can easily and cost-effectively (<\$0.10/watt installed) be applied to either new or pre-installed solar panels and that increases their conversion efficiency by a revolutionary 10% or more. Genie Lens has sole ownership of the four patent applications underlying the technology and the associated manufacturing process.

SOLOPTICS ECLIPSE

Industrial Concentrator

Eclipse is an inexpensive, scalable utility-grade concentrator that tracks on one or two axis and is designed to significantly reduce both costs and acreage needs. Components are made from readily available and inexpensive materials (glass, acrylic and metal - no mirrors) that are fast and easy to produce, ship and assemble. Significant temperatures are easily obtained. Water requirements are negligible. A provisional patent has been filed and a patent application is in process. Potential applications include solar thermal power and industrial steam generation.

SOLOPTICS SPECTRUM

Ultra-Thin Flat Panel Concentrator (for PV or CSP)

Spectrum is a low cost and low profile (1" total) unit comprised of little more than two sheets of embossed glass or acrylic and a frame which directs rays to the perimeter for conversion to usable energy. The highly efficient panels can be linked together for scalability. The current design is tracking, but future iterations can be non-tracking (with possible BIPV applications). A provisional patent has been filed and a patent application is in process.

SOLOPTICS CHROMA

Cross Market Concentrator

Chroma is a patent-pending, low profile, non-tracking, highly efficient concentrator for PV and CSP that can be applied to residential, commercial, and utility markets. Safe, low maintenance and inexpensive, Chroma is made from readily available materials such as glass and acrylic. Other potential applications include desalination, water purification and weaponry.

Spotlight on **FUSION**
Photovoltaic Enhancement Technology from SolOptics

Fusion is an industry-changing technology that promises to substantially impact efficiencies in photovoltaics and completely change the economics of how solar energy is delivered. Using micro structures embossed into either thin film (adhered onto a PV panel) or directly into the glass panel, Fusion provides a minimum of 10% gains in conversion efficiency for less than \$0.10/watt (installed cost). Fusion can be applied to any PV technology (crystalline silicon or thin films) for similar effect.

| VALUE DRIVER | FUSION BENEFITS |
|------------------------------|--|
| Conversion Efficiency | <ul style="list-style-type: none"> • At least 10% net efficiency boost, regardless of panel brand or technology (silicon, thin film)¹ • Significant efficiency gains in cloudy conditions help smooth power spikes |
| Cost Effectiveness | <ul style="list-style-type: none"> • Less than \$0.10/watt installed cost - equates to 12% cost savings on a cost/watt basis • Low maintenance costs • Made from inexpensive, widely available materials (glass, plastic, adhesive) • Commercially available glass, polymers and adhesives are made and tested for a 20 year plus lifetime |
| Scalability | <ul style="list-style-type: none"> • Increases in efficiency reduce required acreage by a comparable amount • Existing extrusion technology can be used to make the film in high volume and at low cost • Structures can be embossed in glass with little to no impact on current manufacturing processes |
| Rapid Deployment | <ul style="list-style-type: none"> • Application can take place in the field or at the production facilities • Can be installed easily without expensive equipment or specialized labor |

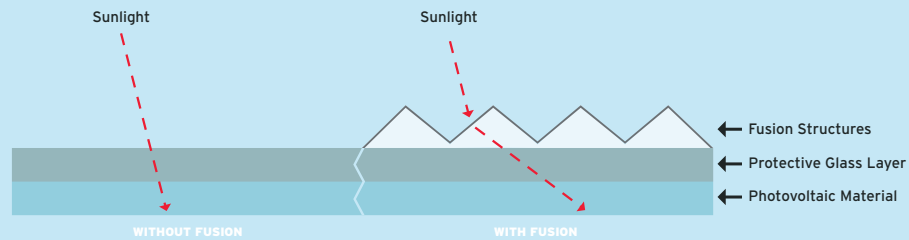
¹ Based on Genie Lens Technologies test results from the National Renewable Energy Lab.

FUSION

Technology Overview

The seemingly simple design of **Fusion** belies its patent-pending and highly engineered structures. Three design principles are optimized concurrently to achieve significant efficiency gains.

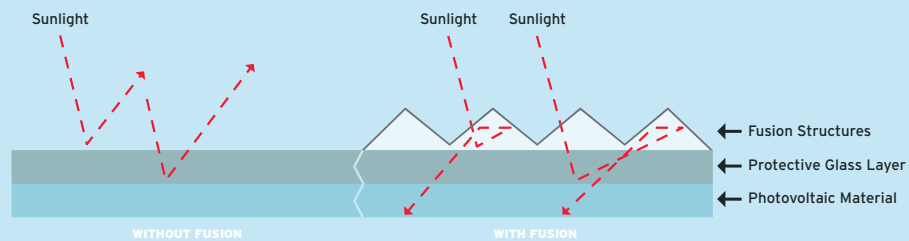
Path Length



Increases net energy output

Boosts opportunity for electron replacement due to increased distance of light ray within photovoltaic material.

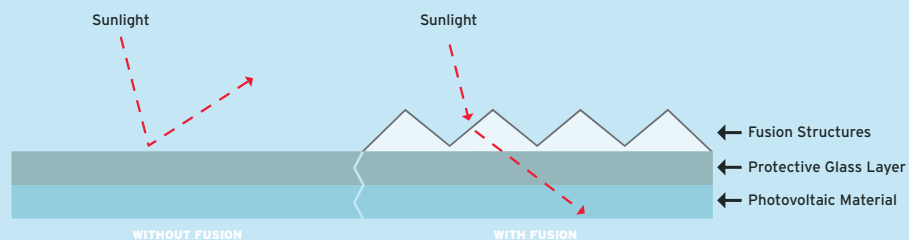
Total Internal Reflection



Increases opportunity for absorption

3D structures in film redirect light reflected from surfaces of glass and solar cell back into photovoltaic material for absorption.

Anti-Reflection



Increases transmission across incident angles

Panels lose sunlight to reflection throughout the day. Fusion's micro structures prevent the rays from reflecting off the surface, particularly during off-peak hours.

NOTE: Diagrams are not to scale. Structures differ in geometry.



Technology Development

Mark Raymond

Chief Scientist and Co-Founder

Mr. Raymond is responsible for the design and ongoing development of Genie Lens' intellectual property and proprietary software. He has authored over four dozen patent applications in lenticular optics and solar technologies. He has been an innovator and serial entrepreneur in the printing and lenticular industries for over 20 years, founding several multi-million dollar consulting and printing companies between 1987 and 2002. In 1991, he oversaw one of the largest plastics printing and conversion plants in the world in Ashikaga, Japan for Achilles Corporation - a plant that is still in operation today. It was as a result of this extensive experience that Mr. Raymond built his reputation as an expert in plastics printing, ultra-violet technology, and lenticular optics.

Three of Mr. Raymond's plastic printing innovations have been recognized as among the all-time best in the industry by Dr. Beckett of Beckett Price Guide. Mr. Raymond is also recognized as a pioneer and innovator in lenticular optics technology and in the printing industry, first developing collector cards that utilized video capture technology in 1995. He was identified as one of the top 60 entrepreneurs under 40 years old by Inc. Magazine and the Sloan School at MIT. He graduated from Arizona State University with a Bachelor of Science in Marketing and a minor in Finance.

Howard Lange

Senior Physicist

Mr. Lange works closely with Mr. Raymond to develop Genie Lens' intellectual property and proprietary software. He is responsible for the application and development of over three dozen patents in his lifetime and is recognized as an expert in optics technology. He previously worked with Zenith Electronics Corporation where he led the design of various products related to cathode ray tubes and lens designs in color televisions. Mr. Lange also worked for APECO where he was a junior physicist responsible for designing illumination systems and electrophotographic products. He graduated from the University of Chicago with a Bachelor of Science in Physics. He received his Masters of Science in Physics from DePaul University.



SOLOPTICS

Management Team

Business and Operations

Seth Weiss

Chief Executive Officer and Co-Founder

Mr. Weiss brings over 20 years of legal and business experience to Genie Lens. Together with Messrs. Raymond and Lange, he has helped author several of Genie Lens' patent applications. Prior to founding Genie Lens in January 2006, Mr. Weiss was President and Founder of Westcliffe Capital Corporation which administered over \$100M in capital placement and provided financial consulting services. Prior to Westcliffe, Mr. Weiss practiced corporate transactional and securities law, overseeing over \$1B in transactions for his clients. Mr. Weiss graduated Phi Beta Kappa from Colgate University with a dual major in Philosophy and Religion. He earned a Juris Doctorate from the University of Denver College of Law.

Melissa Grossman

President & Chief Operating Officer

Ms. Grossman brings over 20 years of experience in operating and management roles in high tech international companies to Genie Lens. Prior to joining Genie Lens in July 2009, Melissa was a Co-Founder and Managing Director of Bulldog Partners, a business and technology strategy and operations consultancy with clients ranging from the Fortune 500 to entrepreneurial start-ups. Previously, as Managing Director for international internet services firm Zefer, Ms. Grossman built the New York office and grew revenues to over \$40M in less than 2 years. As Director of Electronic Media for News Corporation, she designed and implemented new technology projects, joint ventures, and strategic investments. Ms. Grossman graduated with a Bachelor of Arts in Psychology from Duke University and earned her Masters of Business Administration from Harvard Business School.

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