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Solar Concrete Wall Systems

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Solar Concrete Wall Systems

SolaBlock LLC (USA) has announced a pioneering new line of unitized concrete/solar wall block systems called Solar Masonry Units-SMU™. The new block technology features traditional concrete masonry units with integrated solar cells, allowing previously underutilized vertical surfaces to become attractive, dependable renewable energy generating spaces.

Wall construction with SolaBlocks is virtually identical to traditional concrete block installation practices. Electrical connections are easily made after mortar cure, making the new technology both visually appealing and convenient for today's professionals.

"It's incredibly rewarding for us to have helped create a new construction product that brings cost-effective solar energy production to building facades,'' said Patrick Quinlan, CEO and co-founder of SolaBlock. "Crowded roofs no longer mean there's no place for solar in typical city settings. We're part of a vertical solar revolution that will give the world, especially those in urban communities, a means to directly address the climate crisis while also providing the many benefits of clean, renewable onsite energy generation, right at home."

The concrete serves as both an important load-bearing component and thermal mass (or "heat sink") to lower the integrated solar cells' operating temperatures.

As the world's building stock ages, changing communities face a growing need to replace or upgrade commercial, industrial and residential structures. SolaBlock wall systems used in the construction of community centers, hospitals, schools and universities enable these key buildings to generate power immediately after a hurricane, increasing local disaster recovery capability while also augmenting - or wholly providing - standard daily energy needs under normal conditions. Quinlan adds, "This is clearly a game-changer for communities impacted by increasingly severe weather patterns, such as in the Caribbean and low-lying U.S. coastal cities."

The combination of societal demand for on-site renewable energy with the need to replace crumbling infrastructure creates a strong market opportunity for SolaBlock. New buildings using solar wall systems will create more sustainable cities overall.

An Innovative Concrete Solar Solution

SolaBlock's co-founder and Chief Operating Officer of SolaBlock, Jason Laverty is a longtime R&D mason with Local # 3 Boston Bricklayers Union. He notes that the Solar Masonry Units SMU blocks conform to U.S. construction standards, with a 4-inch form factor, adding "The unit is clad with a solar panel set into the exterior face to generate electricity on any façade." SolaBlock has patented the design and shoes to be adjusted to any standard, such as metric.

SolaBlock's solar masonry wall systems output approximately 10 watts per square foot annually (approximately 100 kwh per square meter (10 kwh per square foot) depending on latitude and local ground reflection.

Solar wall block systems can readily replace standard brick or block cavity wall components, providing on-site energy generation, where it has the highest value.

Vertical facades can now become important new options for creating renewable power, so SolaBlock literally offers an exciting new direction in solar. "And," adds Laverty, "the units can also be oriented to fit into any modular construction to go around doors and windows as regular blocks do."

During the late summer 2019 installation of a demonstration solar wall on location, the solar SMUs attracted plenty of attention.

SolaBlock's wall systems have been under development for nearly seven years and make the best use of concrete's well-known physical properties to enhance solar generation. The concrete serves as both an important load-bearing component and thermal mass (or "heat sink") to lower the integrated solar cells' operating temperatures. This greatly improves their longevity and operating efficiency, while also providing protection from weather and wear and tear. The robust SolaBlock SMU units are also designed to survive accidental impacts, deliberate kinetic assaults, hot and cold extremes and significant weather. The company has plans underway to secure U.S. hurricane design standard certification for the product line.

Creating New Masonry Opportunities in Green Construction

Of particular importance for the concrete industry, SolaBlock wall systems enable concrete suppliers to participate in emerging opportunities in green construction. With ever-increasing demand for energy efficiency and on-site renewable energy production, particularly in urban and campus communities, the SolaBlock wall systems meet the need where roof space and architectural features present significant design or retrofit challenges. With SolaBlock, solar energy can be specified for facades where conventional solar has traditionally been a poor fit. Concrete providers can have solutions that compete well in the green space. "At its core, SolaBlock is still a block," says Laverty. "It's impressive to see how masonry is now able to play an important new role in the green building industry. With most new projects going green, and many being constructed in urban locations, this technology is coming to market at just the right time to make a major impact."

Bringing Market Share Back to the Masonry Trade

SolaBlock is located in western Massachusetts, USA, historically known for its strong manufacturing tradition. Quinlan is proud to point out that "partnering with established local companies was a high priority for SolaBlock. It's led to powerful partnerships, such as leveraging the knowledge of a former GE Plastics company's resources and supply chain for kitting our solar cells into the blocks. Local sourcing improves turnaround time and design scalability."

SolaBlock has also partnered with Massachusetts-based concrete fabricators R. Ducharme Inc. as its first block manufacturer. During the late summer 2019 installation of a demonstration solar wall on location, the solar SMUs attracted plenty of attention. Recalls Laverty, "Many tradesmen walked over to the assembly to look at the blocks and ask questions. They immediately saw the simplicity and strength of the units and were, to say the least, very excited about the possibilities of the SMUs."

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Robert Dudas of American Masonry was the first masonry partner to install SMU blocks as part of a contracted job. He says, "It's just like laying regular block. I lost no installation time, and I could stick to the same regular time frames I typically set for customers. The SMUs labels line up like candy stripes when laid correctly, so I can instantly see from across the worksite that a block is being put in properly. I'm impressed, and I think this is really a great idea."

Stimulating Local Manufacturing

The partnership of SolaBlock and R. Ducharme Inc. has proved the feasibility of scalable manufacture of the SMU units, opening one of Quinlan's key visions: an array of makers across the U.S. and well beyond.
"Shipping concrete is costly," says Quinlan, "so as the demand for SolaBlock products ramps up, we're planning to partner with regional concrete manufacturers to create the actual blocks. The solar kits will be shipped in from our New England suppliers, joined with the concrete bases locally, and delivered to sellers and contractors in proximal markets."
Quinlan adds that the regional - and eventually international - concrete casting and assembly network will create jobs in each market while ensuring that SolaBlock prices are kept as competitive as possible.

Creating New Value for End-use Customers

SolaBlock's technology is cost-effective and cost-competitive with utility power in many areas, with expected installation costs ranging from $2 to $3 USD per peak watt. A typical SolaBlock wall installation can supply most of the electrical demand of an efficient building, and can supply all electrical needs of some buildings if the product is installed on three sides.
End-user customers are demanding products that enable climate-crisis action. There is mounting global demand to meet LEED certifications, GRESB metrics and on-site energy mandates. SolaBlock supports them all, in an innovative way. SolaBlock has created a product suite that allows all new construction to be built with on-site renewable energy. With additional patented products in the development pipeline for retrofitting to existing buildings, the company has developed an exceptional new opportunity for most buildings to generate a portion or potentially all of their own electrical needs.

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See here a video about SolaBlock's solar masonry wall systems.

FURTHER INFORMATION

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