

# GLOBAL2010AWARD



DuROCK, Sanyo & Avacos team up to harness the energy of the sun and bring it to the mainstream

## Introducing photovoltaic into the mainstream

The concept of harnessing the energy provided by the sun has long been in the human consciousness, however the various solutions and technologies devised for accomplishing this task have faced challenges in efficiency and practicality. In the contemporary context, the pressure to find improved solutions to these challenges has been increased due to geopolitical instability, rising fuel prices and, of course, the devastating environmental impacts from our conventional sources of energy.

Solar project integrator AVACOS Solar matched together DuROCK Alfacing International

and SANYO Canada Incorporated to form a consortium equipped with the technology and expertise to take an innovative step forward in bringing solar photovoltaic energy to the mainstream.

In this submission for the Globe2010 Award for Technology Innovation and Application, we will showcase our accomplishments in matching the innovative technology and knowledge required to solve the pressing environmental problems associated with our planet's energy production. This includes highlighting our accomplishments in bringing innovative technology

from concept to production, aligning with strategic partners for purposes of commercialization, reducing environmental impacts, and finally rising to meet current and future challenges.





Ti-coat, is a high-strength elastomeric coating that provides the ultimate in reflectivity, and weather resistance over new or existing roof surfaces. Although it is highly flexible, it exhibits a tough, enamel-like finish that resists abrasion, biological growth, dirt and all types of weather extremes.



## Technological & Environmental Innovation Concept to Production

DuROCK, a Canadian privately owned family business, has built a strong reputation for innovation in construction products over the past 30 years. We recognized early on that green construction materials and manufacturing processes would set the new standard in the building industry, and begun implementation early on. With construction costs on the rise, energy efficient applications are playing an increasingly important role in the future of building envelopes. As a green manufacturer, in addition to providing exceptional quality in our products, we place a strong emphasis on sustainability, and the reduction of our carbon footprint.

Over time, global warming has had an increasingly negative impact on the environment and our population. Being environmentally conscious was the key factor in the

design of our state-of-the art manufacturing facility over 10 years ago. We constantly monitor and improve our manufacturing processes to ensure we are operating at maximum efficiency, with minimal energy utilization thereby reducing our carbon footprint. It begins with our wastewater treatment equipment, which is comprised of dual nine-thousand gallon storage tanks that were installed when the facility was initially constructed. Wastewater is collected via drains and sent through filters which separate the water from the contaminated sand. The water is then sent through filtering equipment which cleans the water, and is then pumped back through our hoses for use in production of materials and cleaning of various tanks and equipment. The contaminated sand is also accumulated through a series of complex filters which cleans and divides the sand accordingly. The separated



sand is then stored in reusable totes, until it is required for the manufacturing of our various products.

The manufacturing facility is also equipped with 14 dry silos and 7 bulk liquid storage tanks, capable of holding millions of pounds of raw materials. The immense storage capabilities allow the company to purchase raw materials in bulk, tank truck loads. Material is then pumped from the tank trucks through a series of pipes to the respective storage silos and tanks. This process reduces packaging materials, which would otherwise end up in landfills. Fuel costs and pollution are also minimized as the bulk tank tractor trailers are capable of transporting greater quantities of raw materials than regular tractor trailers.

The employment of recycled materials in our processes evidences DuROCK's commitment to sustainability and social responsibility. DuROCK's innovation has raised the standards in the industry, all the while decreasing our expenses. Our cost savings are reinvested into our research and development division, allowing us to continue to develop breakthrough, eco-friendly products.

Our latest innovation TIO-COAT, is a water-based reflective roof coating comprised of a high-strength elastomeric urethane. The manufacturing of TIO-COAT does not utilize any harmful



Most cool roof applications have a smooth, bright white surface to reflect solar radiation, reduce heat transfer to the interior, and save on summertime air conditioning. These properties also can extend the life span of a roof. By limiting the quantity of absorbed solar energy, damage from ultraviolet radiation and daily temperature fluctuations – which cause repeated contraction and expansion – can be reduced

chemicals or additives, and no harsh 'off gases' or 'VOC's' are emitted in the process. TIO-COAT reflects the harmful and damaging UV rays caused by the sun on rooftops of commercial and industrial buildings. During its research and developmental stages, Gary Campacci a visionary with a deep passion for this industry, discovered that the coating had several additional benefits. TIO-COAT's tough white finish resists abrasion, biological growth, dirt and extreme weather conditions.



**MEDIA EVENT**  
 Presidents of DuROCK Alfacing International  
 Sanyo & Avacos.

### Strategic Partnership Commercialization

The emergence of these two technologies by AVACOS Solar Energy Inc. provided a great marketing forum to showcase the first-ever unveiling of both DuROCK's TIO-COAT Membrane and SAYNO's HIT Double BiFacial Solar PV modules. In addition to providing a reflective surface that enables the HIT BiFacial modules to gather solar power from the top and bottom of the panels, the membrane regulates the temperature of the roof thereby significantly reducing the inhospitable high temperatures that

conventional roofs provide. This further commercializes the technology by offering clients, who are already interested in renewable energy and conservation, an even more lucrative incentive to be environmentally conscience. To further highlight TIO-COAT's benefits outside the solar generation realm, the membrane's ability to regulate temperatures within a building, translates into a perfect renewable energy formula for the technology, increased power generation while simultaneously reducing energy consumption.

The collaboration of these two technologies also works to commercialize the other in that, more and more architects, design firms and clients are considering TIO-COAT applications when presented with the advantageous platform it offers the already-existing benefits of solar technology. Alternatively, where only TIO-COAT applications were being considered, more interest is being expressed to utilize its full benefits by combining it with the HIT Double BiFacial modules. All of which is only further enhanced when one accounts for the LEED rating already associated with TIO-COAT.

## Reduction of Environmental Impacts

As opposed to alternative roofing membranes, TIO-COAT is not only cost competitive, but the method whereby replacing or additional product is quick and easy, unlike a roofing membrane which literally has to be ‘cut out’ and fully replaced resulting in a cost of thousands of dollars. The versatile roof coating can be applied on a large variety of materials such as single-ply, asphalt, polyurethane foam or concrete roofing. The coating creates a uniform, seamless surface that remains flexible even at low temperatures, resulting in a longer roof life cycle as well as providing the ability to reflect 89% of the sun's harmful UV rays. The UV reflection will reduce the interior temperature of the building and result in savings of up to 20% by reducing the peak electrical demand level in hot summer months. The primary benefit of TIO-COAT is that it reduces ‘the heat-island effect’.

The above illustration depicts the ‘heat-island effect’, whereby thermal properties of buildings add heat to the air by means of conduction. As illustrated above, the urban area which contains large buildings, tar, asphalt, brick and concrete conduct more heat than the rural area which contains primarily vegetation. Because homes and buildings absorb the Sun's energy, heat islands increase the demand for summertime cooling and raise energy expenditures. In cities with populations over one-hundred thousand people, peak utility loads in the summer time increase 1.5 – 2% for every 1<sup>o</sup>F (0.6<sup>o</sup>C) increase in temperature. Steadily increasing downtown temperatures over the last several decades mean 3 – 8% of community-wide demand for electricity is used to compensate for the heat island effect which translates into tremendous cost and energy savings.

TIO-COAT is shipped in reusable storage totes, further reducing DuROCK's carbon footprint. Upon completion of their projects, customers or contractors are encouraged to return the totes to DuROCK, where they are washed and re-used. The process eliminates excess packaging materials, resulting in a reduction in waste. By shipping in bulk totes, transportation costs are also greatly reduced, as is the resulting pollution inherent in the shipping process.

While we have made great advances in our products and production processes to ensure environmental sustainability

and reduce our carbon footprint, it is never enough. Together with our staff, we take pride in staying ahead of the industry by constantly creating and refining our products and processes to ensure long term sustainability. We believe that greater results can be achieved by working collectively, as evidenced by the success we have achieved with our partners Sanyo Canada, and AVACOS on a project that combined our technologies and expertise for the benefit of the environment. DuROCK is very proud to be the first Canadian company to benefit from what could someday be the most important energy source of the future.

## A New Solution for Current Challenges

DuROCK Alfacing and its consortium partners SANYO Canada and AVACOS Solar have used their innovative technology to rise to the occasion in order to meet increased demands for economic performance of solar photovoltaic installations.

With the passing of the Ontario Green Energy Act and last year's review of Ontario's Feed in Tariff program, the environmental and economic demands for solar energy have gone through several important changes. Now, with stronger economic incentives driving solar energy in Ontario, mainstream investors have taken notice and the solar energy revenue and associated payback period have become key selling points for investors.

DuROCK's TIO-COAT roof membrane was developed to both seal the roof with a protective coating but also reflect the sunlight to reduce the aforementioned ‘heat island’ effect produced by typical roof coverings. This reflective capability helps to reduce the cooling costs of the building, saving energy and associated costs. The SANYO HIT Double® bifocal solar module produces up to 30% more energy by using both sides of the panel to generate electricity.

Combination of these technologies provides improved benefits which contribute to the business case for solar energy and help reduce the payback period for the project. Typically solar modules perform less efficiently as the temperature of their environment increases. However, by installing solar modules on the cooled surface of the TIO-COAT roof membrane, the effect of this loss in efficiency is diminished.

In addition, SANYO HIT Double® solar modules rely on reflected light to reach back surface of the panel in order to generate additional energy. Given the reflective nature of the TIO-COAT membrane, more light is directly reflected onto the back side of the modules, thus improving their overall energy yield. Thus, with stronger economic incentives attracting conventional investors seeking to minimize the length of their payback period, DuROCK Alfacing, SANYO Canada and Avacos Solar have applied their innovative technology to meet the increased demands of the marketplace. This not only makes the integration of these technologies more attractive for potential customers, but also helps to promote solar energy in general as a safe investment for new shareholders attracted to this industry.

# The Conclusion: Commercialization

In recent years, there has been a prevalent trend in the growing acknowledgement of environmental issues and the increased pressure to find economical solutions. Companies who are able to be innovative by combining their technology and expertise to pursue these solutions will find themselves poised to capitalize on tremendous opportunities.

With its recent installing of SANYO HIT Double ® bifacial solar modules and TIO-COAT roofing membrane, the consortium of AVACOS Solar, DuROCK Alfacing International and SANYO Canada Incorporated has taken an important step in meeting the challenges associated with solar energy. By innovatively combining these synergistic products, this consortium has managed to bypass some of the inherent challenges associated with solar energy to develop a solution that provides cooler buildings and more productive solar modules.

It is for this reason that we have submitted our candidacy for the Globe2010 Award for Technology Innovation and Application and showcased our accomplishments in matching the innovative technology and knowledge required to solve the pressing environmental problems associated with our planet's energy production. We hope to show that even when running a group of successful businesses, one can still strive to drive products to market with not only economic, but also social and environmental gains.



**MEDIA EVENT**

Gary Campacci,  
President of DuROCK  
Alfacing International  
talks to the press.

