

Thousands of silicon spheres bonded to thin, flexible substrates.

Spherical Solar Power, a division of ATS Automation Tooling Systems Inc., Ontario, Canada

Revolutionary new solar cell facility uses PSP® to safely handle corrosive fume exhaust

In these days of ever rising energy costs, one Canadian company has unveiled a new type of solar cell technology to harness the nearly limitless potential of the sun. This new solar cell technology, expected to revolutionize the advanced photovoltaic cell industry, uses thousands of tiny silicon spheres as the focus of this breakthrough. And Fab-Tech's PermaShield Pipe® played a major role in the corrosive exhaust system of this new manufacturing facility.

Background:

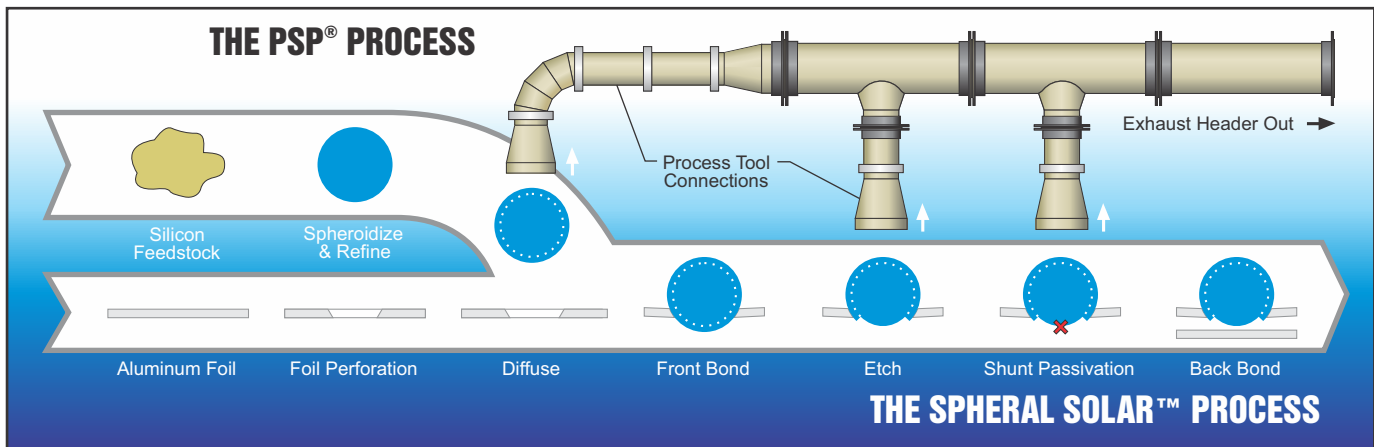
Spherical Solar Power (SSP) of Cambridge, Ontario debuted their new manufacturing plant in June of 2004, and is Canada's first full-scale solar cell manufacturing facility. "The features that immediately grabbed me" commented Vince Rocca, Fab-Tech Director of Industrial Sales, "were the size of the facility, the semiconductor like cleanliness, and the overwhelming use of automation in the manufacturing process." At over 190,000 square feet, the high bay plant is also an excellent showcase for the cutting-edge technology of Spherical's parent company, ATS (Automated Tooling Systems, Inc.).

A breakthrough in solar energy, Spherical Solar™ cells can produce electricity through the direct conversion of sunlight into DC electricity through the use of thousands of silicon spheres bonded to thin, flexible substrates. These solar cells are assembled into durable, flexible and lightweight modules of varying sizes that can be applied to virtually any surface.

Solar cell manufacturing employs many of the same materials and protocols used in semiconductor production. For example, the etchants and rinsing agents used to fabricate semiconductor devices are very similar to those used to fabricate photovoltaic (PV) cells. In the case of Spherical Solar™, silicon feedstock is refined and rolled into tiny spheres. The spheres are then diffused and front bonded to perforated aluminum foil. Next comes chemical etching and shunt passivation, and finally, back-bonding to another layer of aluminum foil. "I could clearly see that SSP wanted to design not just a clean manufacturing site" commented Rocca, "but one where worker safety was first and foremost." Double contained chemical areas, hazardous vapor sniffers and many other cutting edge safety devices were incorporated into the design of the new facility. And for the safe handling of corrosive exhaust, Fab-Tech's premiere fluoropolymer coated stainless steel duct was selected.

Drawing on past successes:

The project design team at SSP drew on past knowledge and successes when planning many of the innovative features of their new facility. The basic plant design was done by SSP's parent company, ATS, with process input from Lockwood Greene Engineers. Many people on the core design team had first-hand experience in microelectronic and semiconductor facilities around North America. Facilities Manager John Ferguson and Facilities Engineer Mark Adams both had knowledge of plant operations and products (including coated stainless steel duct) from past employment with Nortel, Canada. A cost analysis of several types of corrosion resistant duct was conducted, and fluoropolymer coated stainless steel far surpassed other products due to its FM approved fire and smoke rating and the fact that it would incur no further maintenance costs.



Solution:

SSP exhaust duct analysis led them to Fab-Tech, Incorporated. Fab-Tech's product, PermaShield Pipe (PSP®), has been used for nearly two decades in the semiconductor industry as the premier product for exhausting corrosive fumes. Their 300 series stainless steel duct with proprietary fluoropolymer integrally bonded to interior surfaces delivers exactly what SSP needed; unparalleled corrosion protection, structural integrity and ease of installation without the need for internal sprinklers.

One of the critical factors in selecting PSP® was its FM rating. FM (Factory Mutual) is an affiliate of FM Global, the world's largest insurance company. FM is specifically devoted to reducing commercial and industrial property losses. PSP® has earned the FM Approval mark as stipulated in Factory Mutual Research Standard No. 4922.

Conclusion:

Over 800 feet of fluoropolymer coated stainless steel exhaust duct (ranging from 4 inch up to 60 inch diameter) was delivered on schedule and efficiently installed by the mechanical contracting company Reitzel Heating, of Waterloo, Ontario. "The entire process of working with Fab-Tech went extremely smoothly," remarked Alan Reitzel, design and estimating manager, and Reitzel's project manager on the Spheral project. "The PSP® product was easy to work with and our client was very pleased with both the product quality and the installation."



PSP® header and process tool connections installed in new SSP manufacturing facility.

The demand for renewable energy sources will only grow as nations face increased costs and limited supplies of fossil fuels. Spheral Solar Power will make solar power available to a vast array of new applications and markets, changing the dynamics of the photovoltaic and energy industries - forever. Fab-Tech is proud to play a contributing role in this vital, environmentally friendly and revolutionary technology in solar energy.

For additional information on Spheral Solar go to www.spsolar.com