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European Photovoltaic Solar Energy Conference, Hall 20 Booth F47**

RASIRC Ultra Pure Steam Improves Solar Cell Efficiency

*Steam Generation Process Featured at European Photovoltaic Solar Energy Conference Hall
20 Booth F47*

San Diego, Calif. – August 29, 2007 – RASIRC™, the Steam Purification Company, will feature a low cost, safe, highly effective system to produce ultra high purity steam at the 22nd European Photovoltaic Solar Energy Conference and Exhibition held at the FIERA MILANO/ Rho in Milan, Italy from September 3 – 7, 2007.

RASIRC technology improves many processes within the solar industry:

- **Passivation:** eliminates hydrogen, reducing cost, reducing process time and improving safety.
- **Interlayer Oxide Films:** reduces electron recombination.
- **Transparent Conductive Oxide (TCO):** increases photon capture efficiency.
- **Backside Thick Oxide:** relocation of front electrode

Ultra pure steam is needed to form transparent conductive oxide to improve solar energy capture. Steam is being used to grow thermal oxides on the backside for state-of-the-art current isolation when used with backside contacts. It can be used to form isolation layers between films and annealing of films to reduce defects and improve cell efficiencies.

In the solar industry, the RASIRC steam purification system replaces torches in the production of water vapor from hydrogen and oxygen. Pyrolytic torches are an ultra high purity system with good process control. However, they have several limitations such as start-up time, particulate generation under long term use, and purchase price. In addition, the process requires an excess of O₂ or H₂ to insure complete combustion of one constituent. The net excess leaves the tool, so gas abatement is required. Excess gases can slow the oxidation process of the wafer or lead to

non-grain uniformity, reducing throughput. Even more significant is that combustion of H₂ and O₂ is dangerous and explosive. The high temperature of the pyrolytic reaction leads to a larger thermal event which can affect the temperature profile of the tool, leading to the need for additional equipment and floor space. The combustion of hydrogen must be properly sized. If it's too low, combustion won't occur. If it's too high and the flame reaches the far side of the tool, it can lead to consumption of the quartz. The process requires ultra pure hydrogen and oxygen which can be expensive on a long term basis.

The RASIRC system generates ultra pure steam from de-ionized water, which is inexpensive, widely available, and doesn't require burning oxygen and hydrogen. It uses a non-porous hydrophilic membrane that selectively allows water vapor and steam to pass through it. Contaminants in water such as dissolved gases, ions, total organic carbons, particles, viruses, bacteria, pyrogens, and metals are removed from the purified steam.

RASIRC technology has recently been installed on a 300 mm Tempress furnace at the Fraunhofer Institute. The Fraunhofer Institute is a world leader in the development and fabrication of state-of-the-art photovoltaic solar cells. The RASIRC Steamer is being used to generate backside oxidation to improve the electrical isolation between contacts on the backside and ultimately to generate leading edge efficiencies. "There is great potential for the role ultra pure water vapor can play in the solar industry, as demonstrated by Fraunhofer," said Jeffrey Spiegelman, president and founder of RASIRC. "We are looking forward to discussing these possibilities with innovators at the European Photovoltaic Conference."

About RASIRC

RASIRC products purify and deliver ultra pure liquids and gases. RASIRC technology is the first to generate ultra high purity (UHP) steam from de-ionized water. It reduces cost, improves yield, and improves safety. UHP steam has many applications in the semiconductor industry, nanotechnology, photovoltaic manufacturing and related industries. Call 858-259-1220, e-mail info@rasirc.com, or visit www.rasirc.com.

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