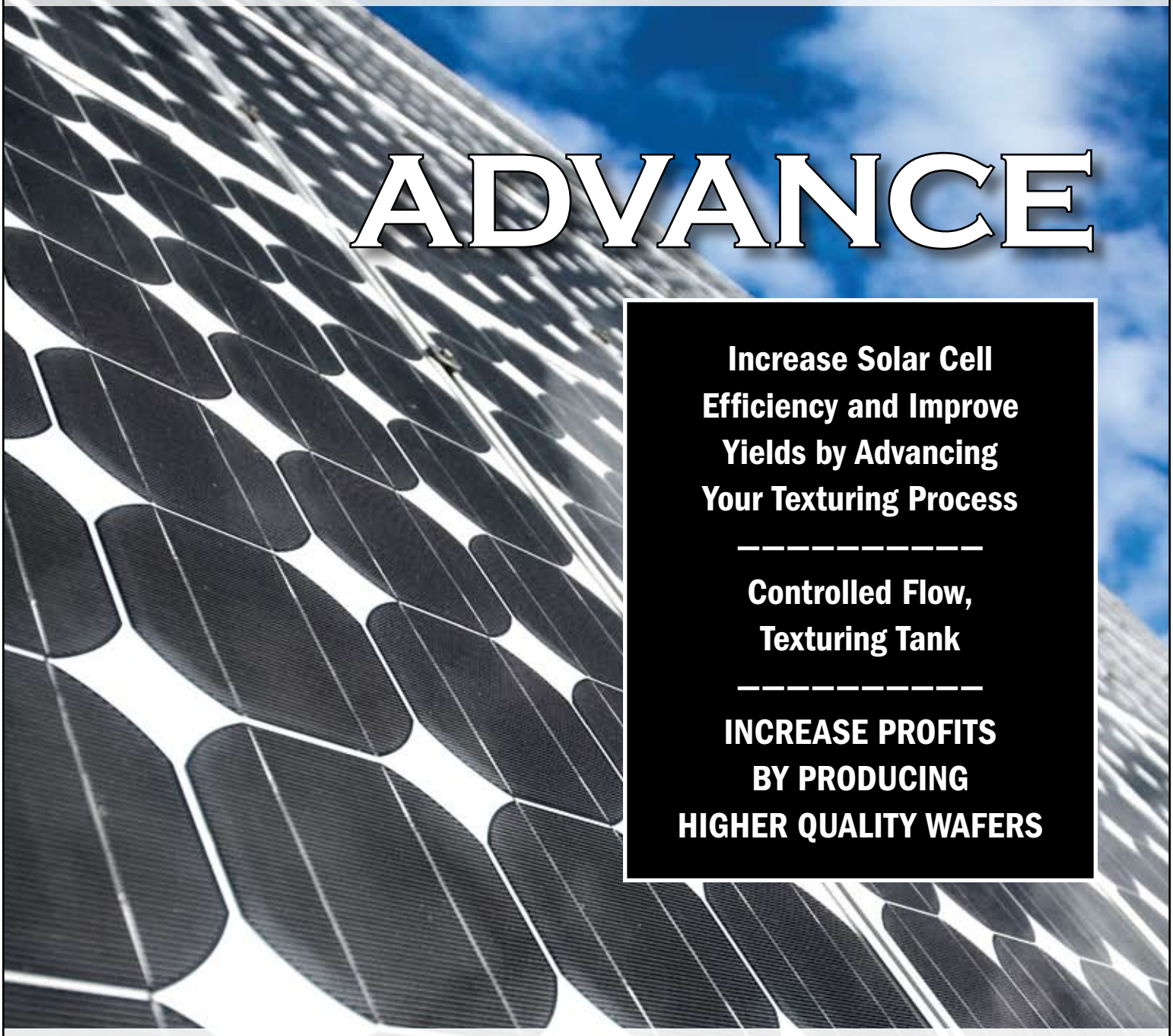
IMPORTANT TECHNICAL UPDATE

FOR SOLAR CELL MANUFACTURING COMPANIES CURRENTLY PERFORMING
A TEXTURING PROCESS ON WAFER SURFACES



ADVANCE

Increase Solar Cell Efficiency and Improve Yields by Advancing Your Texturing Process

Controlled Flow, Texturing Tank

INCREASE PROFITS BY PRODUCING HIGHER QUALITY WAFERS

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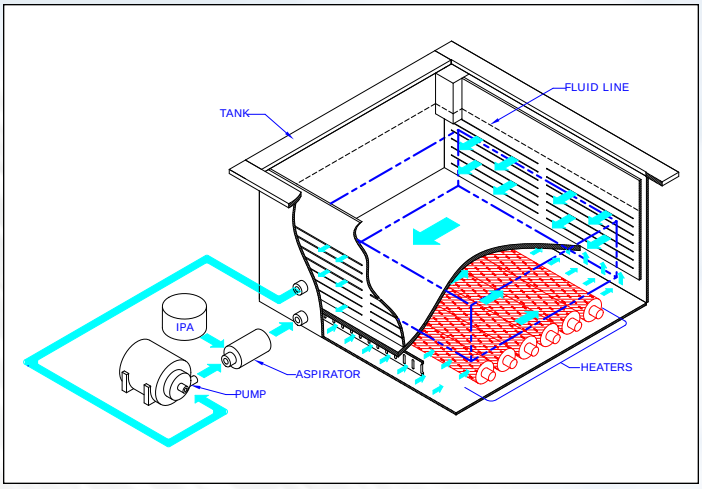
SOLAR CELL APPLICATION NOTE #4

PURPOSE: Increase corporate profits by increasing conversion efficiency of solar cells and by improving production yields.

WHO CAN BENEFIT: Solar cell manufacturers who use a wet etch process for texturing the surfaces of silicon solar cell substrates. Typical wet etch chemistries used for texturing are listed in Table 1.

TABLE 1. COMMON CHEMISTRIES FOR WET ETCH TEXTURING
Dilute KOH + H2O + IPA @ around 80°C
NaOH + H2O + IPA @ around 85°C
Caustic Potash @ 60°C to 90°C
HF + HNO3 + H3PO4

The process for roughening or texturing the surface of a solar cell substrate improves solar cell efficiency by forming minute projections and recesses on the surface so that incident light is absorbed rather than reflected.



Solar Cell Tank Sectional

PROBLEM: The texturing process can be impacted by variations in process temperature and chemical concentration. Other critical factors that contribute to the texturing process are mechanical agitation, reduction of bubbles on the silicon surface, and process and equipment purity. These critical factors must be controlled in order to optimize the texturing process to obtain the desired results.

RECOMMENDED SOLUTION: Controlled Flow, Texturing Tank. This tank is specially designed to implement the texturing process in a production environment. The tank gives the user better control over the critical parameters needed to improve the texturing method.

This innovative tool shortens the process time by causing a more uniform flow across the surface area of the solar cell substrates. In a static tank, solar cells see no flow on their surface. In a standard overflow tank, each solar cells substrate sees different flow rates depending on their position in the tank. By introducing flow in a controlled manner, the solar cells are etched quicker and more uniformly. This allows for greater production in a shorter amount of time and with more consistent results.

The patent pending Controlled Flow, Texturing Tank also removes and eliminates more bubbles from the surface of the solar cell substrates. Controlled flow is combined with an integrated degassing chamber which removes bubbles from the fluid before the fluid enters the process area of the tank.

A heated chamber and recirculation create more uniform temperature and the high purity wetted surfaces insure compatibility with the etch solutions.

BENEFITS: Increase corporate profits by increasing solar cell conversion efficiency and improved production yields. Get better control of the texturing process to improve your manufacturing and optimize your process.

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Patent Pending Design