

Case ID:M16-057P^

Published: 2/26/2020

Inventors

Mark Bailly

Contact

Shen Yan
shen.yan@skysonginnovations.
com

Damage and Resist-Free Laser Patterning of Dielectric Films on Textured Silicon

Dielectric films, such as Silicon-Nitride and Silicon-Dioxide, are used in the production of silicon solar cells. Patterns of these films on the surface of textured silicon allow for the creation of selective, well-defined structures and metallization. A common method for patterning these films is laser removal. However, the laser causes damage to the surface of the silicon. This damage decreases the efficiency of the cell, thus lowering its power generating capabilities. Therefore, there is a need to increase solar cell efficiency by reducing laser damage on silicon surfaces.

Researchers at Arizona State University have invented a coating method for textured silicon solar cells to reduce laser damage. The process is robust when applied to textured surfaces on silicon and shows no visible damage to sites with complete laser film removal. This technique is practical for use with selective contact creation, selective diffusion, and other processes requiring patterned dielectric films. This invention allows for a resist-free laser patterning process of textured silicon dielectric films with no visible silicon damage, thus increasing cell efficiency and power generation.

Potential Applications

- Photovoltaic solar cells
- Renewable energy
- Laser patterning

Benefits and Advantages

- Increased Efficiency – Reduced laser damage increases cell efficiency and power generation.
- Resist-Free - Allows for a resist-free laser patterning process with no visible c-Si damage.
- Increased Longevity – Less damage to the solar cells increases the durability and useful life.
- Compatibility – Compatible with existing materials already used in solar device productions.

For more information about the inventor(s) and their research, please see

[Mark Bailly's directory webpage](#)

