Solar Window Films

**What are Solar Window Films?**

Solar window films are laminated to the interior of glass windows. They provide various types of benefits:

- **Thermal Insulation**
- **Manipulates the solar spectrum**
- **Night time heat loss**
- **Space efficiency**
- **UV Filtration**
- **Reduces ice build up**
- **Flexibility**
- **Expensive**
- **High efficiency**

**Perovskite Solar Cells**

- Toxic material
- Created when microscopic compounds are dissolved perovskite precursors into a solvent that's coated onto a substrate in a vacuum chamber.
- *Spectral Selectivity*
- *Responsive to light and sensitive to air contamination*
- *Blocks up to 92% of UV rays*
- *Reduces solar heat gain by 68%*

**Ceramic Window Films**

- Lightweight
- High heat rejection
- Prevents 99% of UV rays
- Solar absorption

**Advances in Nano Technology**

- Maintains the solar spectrum
- *“Spectral Selectivity”*
- Creates nanoparticles that identify and absorb:
  - Infra Red Heat
  - UV Radiation
- Used by NASA to protect the *SolarWindow*

**Common Goal in the Solar Window Film Industry**

- Low costs in manufacturing
- *$0.50 to $1.00 per watt* (Expected difference if added capacity was either silicon or thin.

**The Future for Solar Window Films**

- Solar photovoltaic cells will expand beyond windows and rooftops
- *Solar PV cells used on surface of cellular devices*
- *Automotive windows generating power*
- **Identifying improvements on existing solar cells**
- Improving crystalline silicon into thinner films
- **Identifying new methods of manufacturing**
- *Identifying new materials*
- *Researchers, scientists exploring properties and performance of materials*
- Improving efficiency records
- Building prototypes
- More test results showing efficiency and behaviors between material

**Discoveries/Improvements**

- *Vacuum Chamber*
- *High temperature deposition*
- *Reduces manufacturing costs (Scaling manufacturing)*
- Creates capital and controllable growth
- Minimal substrate damage

- *Solvent-Solvent Approach on Perovskite Solar Cells*
- *Diffused from researchers at Brown University*
- *Reduces costs of solar panels*
- *Reduces the cost of thin film with high quality*
Works Cited


(2013, January 7). Boston Area Auto, Commercial, Residential Tinting Film and Paint Protection | Tint King. *What is Ceramic Window Film?*