

Transparent Thin-film Modules on Glass

Development of both rigid and flexible semitransparent PV modules for tinted windows is our expertise. Lucintech and The University of Toledo (UT) have recently demonstrated that magnetron sputtering is particularly well suited for depositing these ultrathin coatings of CdTe. These coatings are thin enough to be intrinsically transparent and yet retain most of the power conversion efficiency of thicker coatings. For example, we have fabricated solar cells with 12% efficiency using only 500 nm of CdTe.

Lucintech has completed a partial scale-up of this process and has developed nearly imperceptible laser-scribed cell interconnects while retaining excellent module efficiencies with transparency suitable for windows. These breakthroughs open up the large potential for power-producing PV windows, skylights, and canopies that are truly “building-integrated” and uniformly transparent. These PV windows are uniformly transparent and do not need selective removal of portions of an opaque coating in order to achieve light transmission as some other PV coatings require. Our PV windows do not have distracting lines in the visual field like some other products.

Lucintech’s pioneering technology for the deposition of the semiconductor layers provides unique advantages for creating the uniform, ultrathin coatings needed to achieve transparency while retaining high solar-electric conversion efficiency. In addition, Lucintech’s sputter deposition adapts a process that is well-established in the glass coatings industry. It also allows these durable coatings to be made with a roll-to-roll process on flexible glass or a polymer web to achieve very light-weight and flexible PV modules.

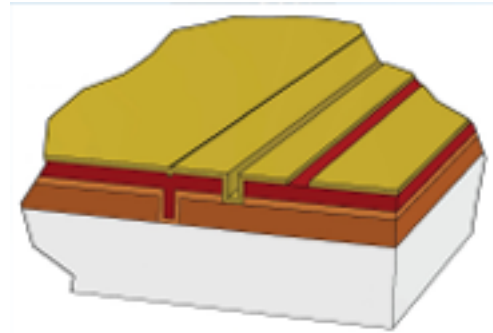
Lucintech also has proprietary technology to provide selectable color tint options to meet designer requirements whether for sunroof or BIPV applications.



Monolithic interconnection

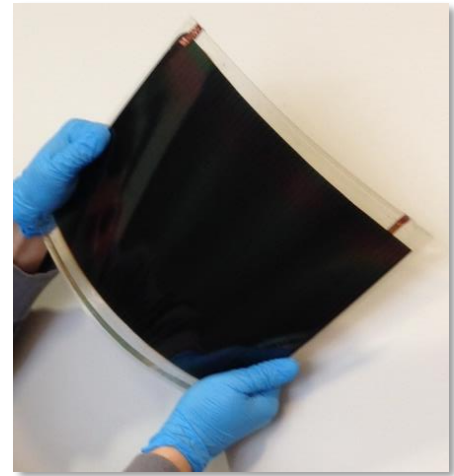
Glass prototype and flexible sheets are fabricated into monolithically integrated modules using laser scribing. The voltage of such a monolithically interconnected module is the sum of the voltages of individual cells and the current is the same as that of an individual cell.

Lucintech's scale-up of deposition size, its demonstration of monolithic interconnection, and its improvements in module efficiency and transparency are being supported with seed funding from investors and more than \$2.8M in grants from the State of Ohio and U.S. SBIR programs.



Flexible Thin-film Modules

Lucintech is also scaling up the fabrication of *flexible*, thin-film solar modules from research-lab-scale cells of square centimeters to a scale of several square feet with efficiencies nearly as high as on rigid glass.



Intellectual Property

Lucintech's IP is protected by four patents and two patent applications licensed from The University of Toledo exclusively to Lucintech. Three additional patent applications are owned by Lucintech. National phase applications are also being pursued in the European Union and five other major national markets.