

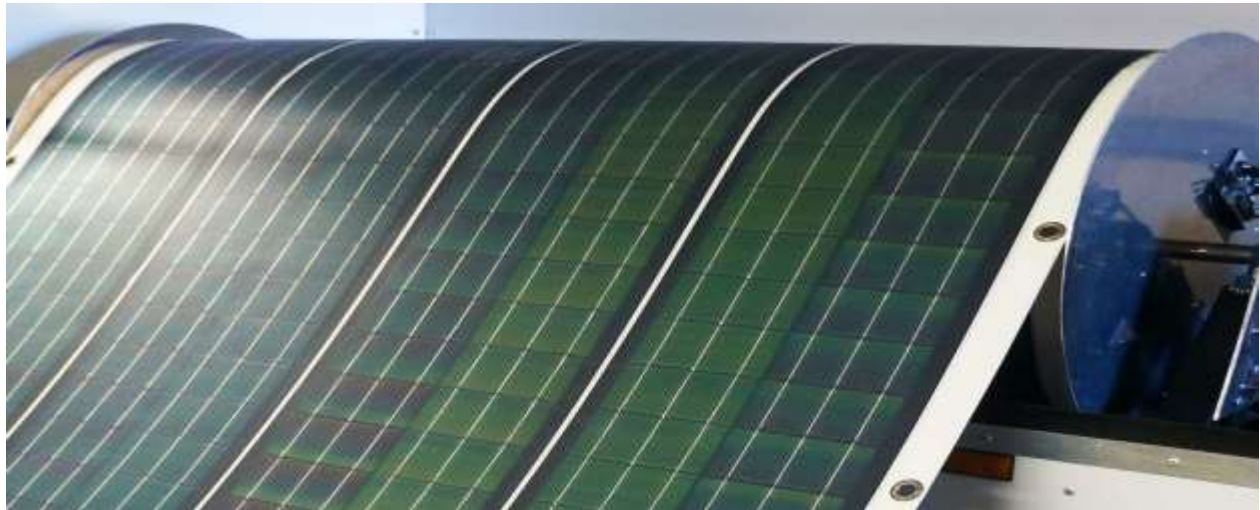
## Technology

As the leader in manufacturing of CIGS flexible thin film solar panels, we continue to set the standards for integration of solar into innovative applications. Our products range from portable solar chargers and building solutions (BIPV) to military applications and emerging innovations.

### **Flexible, lightweight and powerful; our technology delivers.**

GSHK manufactures Copper Indium Gallium DiSelenide (CIGS) by using state-of-the-art, controlled co-evaporation and the thinnest stainless-steel substrate possible to create flexible and light weight thin film PV products for use in any application. We offer proven and accredited module technology, and partner with industry leading brands to develop solutions for your applications. Our proven, controlled and stable production process delivers lightweight and flexible photovoltaic (PV) material from our state-of-art facility in the Hong Kong, Brazil, Turkey and China, and we have more flexible CIGS installed than anyone else in the world.

### **Thin film solar panels**



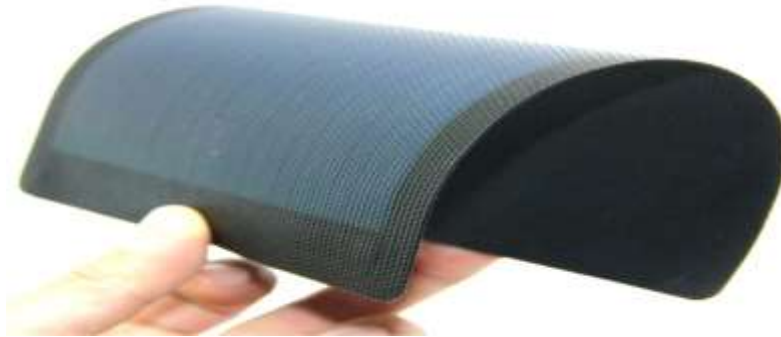
### **Advantages: Light weight, flexible, thin film CIGS panel**

- CIGS offer the highest efficiency of thin film PV technologies
- CIGS offer the highest energy yield at different light conditions
- CIGS offer slow environmental impact and sustainability
- Flexible module materials offer low weight per area roof (kg/m<sup>2</sup>) and low weight per power generated (kg/W)
- Flexible module materials offer low profile and flexible mounting solutions

- Flexible module materials are unbreakable and durable
- Established Manufacturing Process

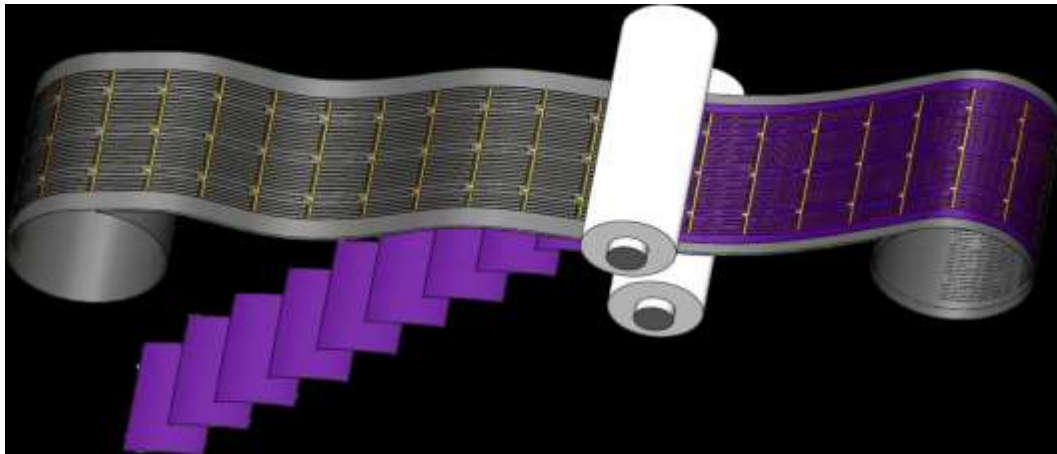
### CIGS Solar Panel

- Lightweight stainless-steel foil substrate + roll-to-roll manufacturing → low manufacturing cost
- Co-evaporated CIGS + 3-stage process → high efficiency
- High CIGS deposition rate + compact equipment → low manufacturing cost
- Inexpensive raw materials for evaporating metals + low material usage → low manufacturing costs



### Cell Interconnect Technology

- Laminating flexible PV cells to a polymer film with patterned metallic conductors → Integrated Cell Interconnect (ICI)
- Low cost raw materials → decreases product cost
- Minimize optical losses + minimize resistive losses → increases conversion efficiency
- Roll to roll lamination process + increase product robustness → high yield process
- Design flexibility + robust submodule handling → enables radical, new product forms
- thin film solar panel



## Module Packaging Technology

- thin film solar CIGS
- Optimized product structures available for every application (up to 25 years warranted lifetime)
- UL, TUV and IEC certified since 2008 + superior field performance → customer satisfaction
- GSHK's intrinsic device stability + reduced vapor barrier requirements → lower product cost and weight (up to 250 W/kg)
- GSHK's product development + manufacturing experience → high yield production process
- Design flexibility + robust submodule handling → enables radical, new product forms

