



sofab

Materials that make
perovskites last.

Blake Martin · CEO & Co-founder

Efficiency $\neq$ Commercialization

~35%

Perovskite-on-silicon tandems beat what silicon alone can ever reach.

34.85% certified tandem cell (LONGi, NREL-verified) vs. ~29% theoretical limit for single-junction silicon.

~27%

Perovskites alone already match today's best silicon cells.

Certified single-junction perovskite cells, small area, 2025–2026.

<150 °C

Printed from inks, not grown from molten silicon.

Solution processing at low temperature vs. >1,400 °C silicon crystal growth. Works on glass, metal foil and plastic.

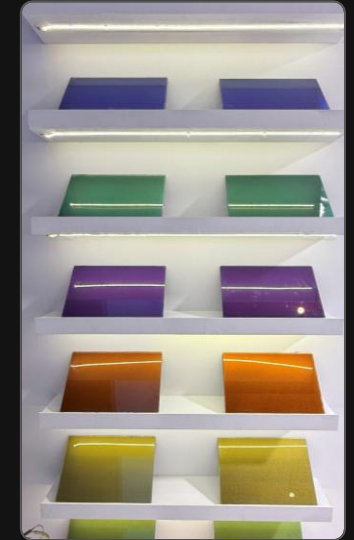
Seen at SNEC, 2025: perovskites are already on the show floor.



Full-size perovskite module: 506 W, 17.6% (BOE)



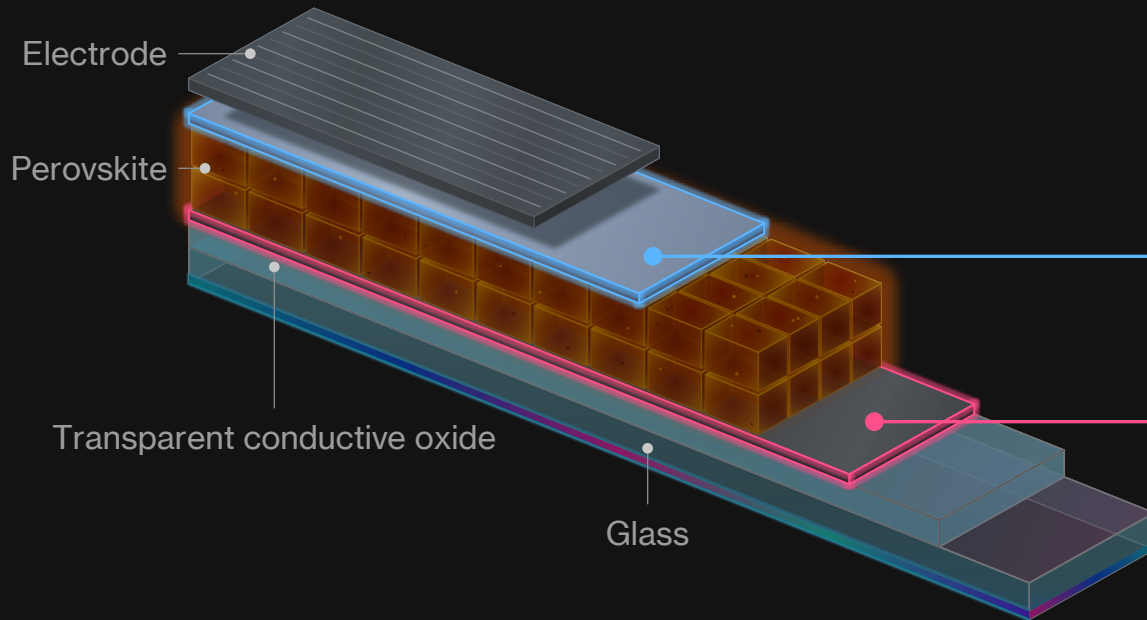
34.85% certified perovskite-silicon tandem cell (LONGi)



Colored perovskite modules (Renshine Solar)

So why isn't it on your **roof** yet?

The perovskite isn't the weak link. The layers around it are.



Electron transport layer (C₆₀)

Extracts electrons from the perovskite

- Peels apart as the panel heats and cools each day (fracture energy ~0.35 J/m²)
- Weak under heat and physical stress (van der Waals-bonded film)
- Let's material drift between layers (metal and halide migration)

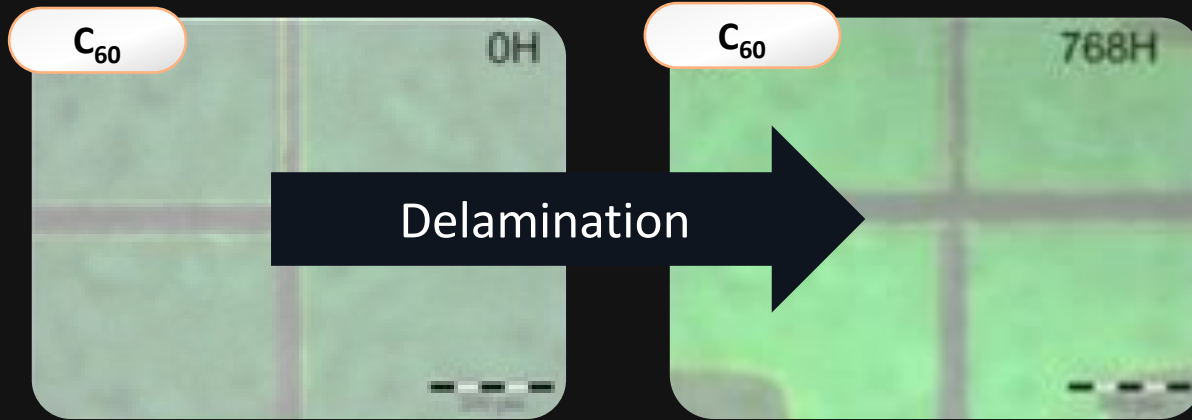
Hole transport layer (NiO_x + SAM)

Extracts holes from the perovskite

- Anchoring molecules loosen at high temperature (SAM desorption)
- Reacts with the perovskite at the contact (NiO_x surface redox)
- Performance fades as the interface ages (interfacial recombination, Voc loss)

Solar panels need to last 25+ years. These supporting layers are often what fails first.

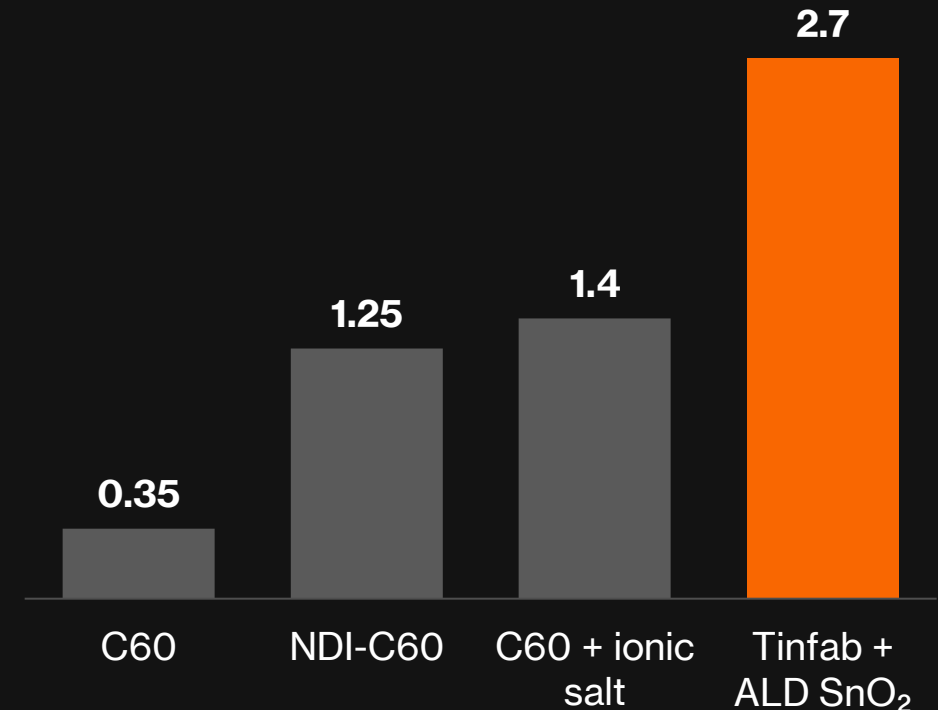
C₆₀ comes apart. Tinfab holds.



~8×

higher fracture energy than C₆₀

Fracture energy, G_c (J/m²)

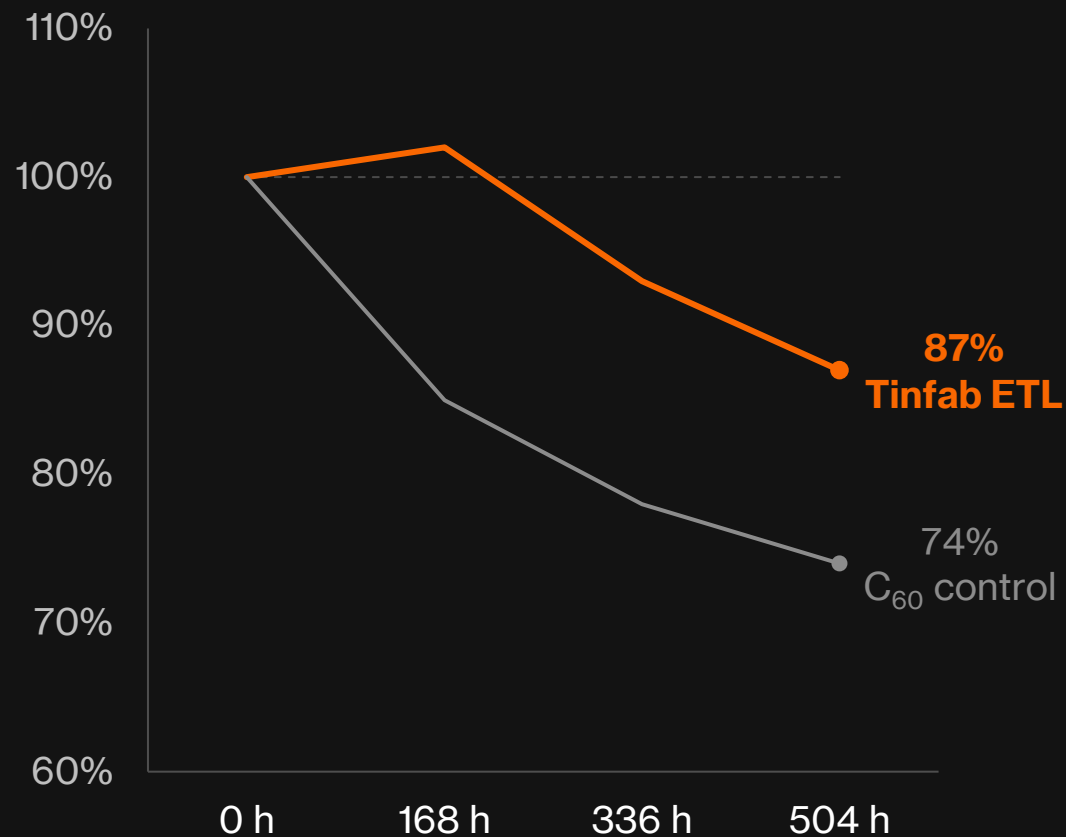


Laser scribe lines after 85 °C heat exposure.

C₆₀: delamination by 768 h. Tinfab: intact at 1,392 h. Optical micrographs.

Durable without giving up efficiency.

Damp heat, full 30×30 cm modules (85 °C / 85% RH)
Normalized efficiency, %, by hours of exposure



10,000 h

at 85 °C (dark): Tinfab retains 81%

C₆₀ control: 69% at ~2,400 h. Data: Solertix.

Efficiency at scale

24.5%

<0.25 cm² · KAUST

22.2%

900 cm² module ·
Alpha Precision
Systems

~17–18%

2,000 cm² · partner
data

Nicfab brings the same metal-oxide approach to the NiOx hole transport layer.

In Their Words

“Instrumental in achieving remarkable stability in our fullerene-free modules... we are eager to scale the use of Sofab-based modules.”

– Francesco Di Giacomo, CTO & Co-founder, SunXT/Solertix

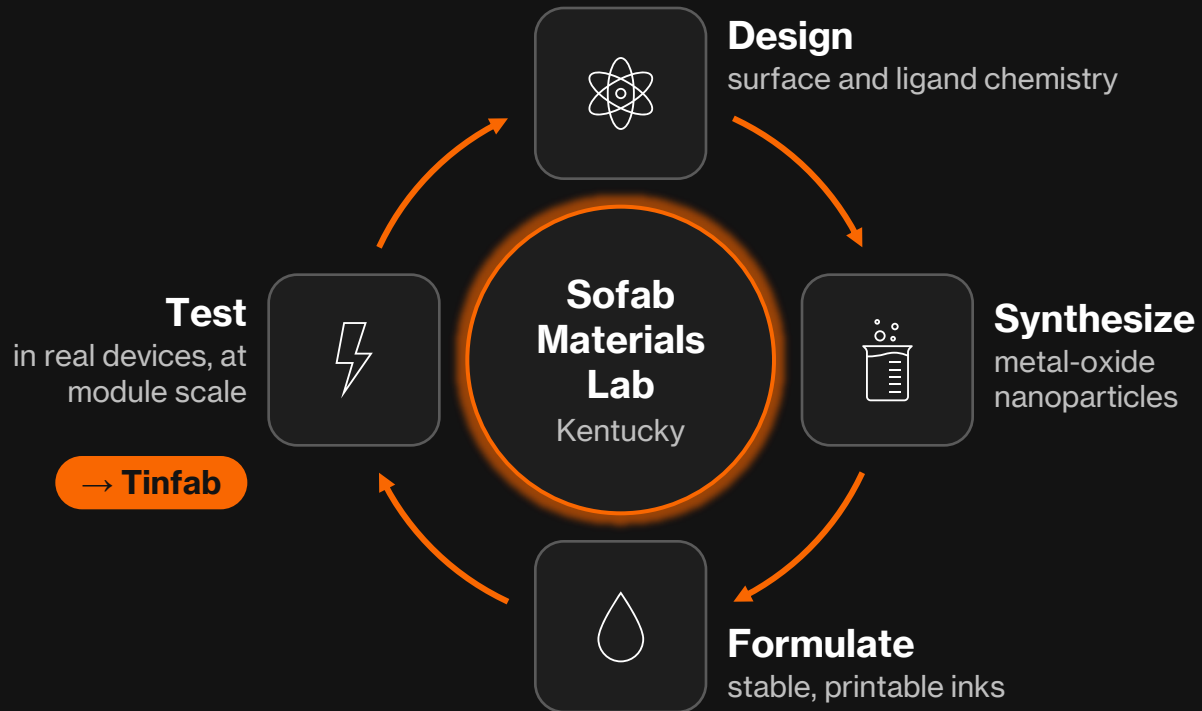
“Choosing the right materials partners is one of the most consequential decisions in next-generation solar development.”

– Paul Moonie, CEO, Halocell Energy



Built to make the next Tinfab.

Sofab's novel materials lab,: functionalized metal-oxide nanoparticles for optoelectronic and electrochemical applications.



Why nanoparticles

Adhesion

Bonds tightly to neighboring layers.

Tunable surface

Engineered to react, for catalysis, or to stay inert, for protection and device interfaces.

PIPELINE

Focus: a \$40B solar materials market.

Tinfab · electron transport layer · shipping

Nicfab · hole transport layer · TRL3

Printed electronics · \$40B by 2030

Anti-corrosion coatings · \$38B

CO2 conversion · \$69B by 2036



We're selecting our next integration partners for 2027.

Building perovskites? Let's talk.

Blake Martin

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