

SOLA-e

Portable Solar for Mobile Systems

SOLAR THAT SURVIVES MOTION

Engineered for real-world motion

Built for Real-World Energy Systems

RV • Marine • Portable Applications

Technical Guide

Most Solar Panels Don't Fail. They Degrade.

In mobile environments, stress accumulates —
often invisibly, until performance drops.



The mismatch:

**Designed for static conditions,
used in dynamic environments.**

► Vibration → cumulative internal fatigue

► Bending → localized stress concentration

► Heat → accelerated material degradation

Stress is not evenly distributed.

It concentrates.

That's where failure begins.

No visible damage. Degradation already underway.



From field use (RV application)



Micro-cracks detected (EL imaging)

Engineered to handle stress — and validated in motion

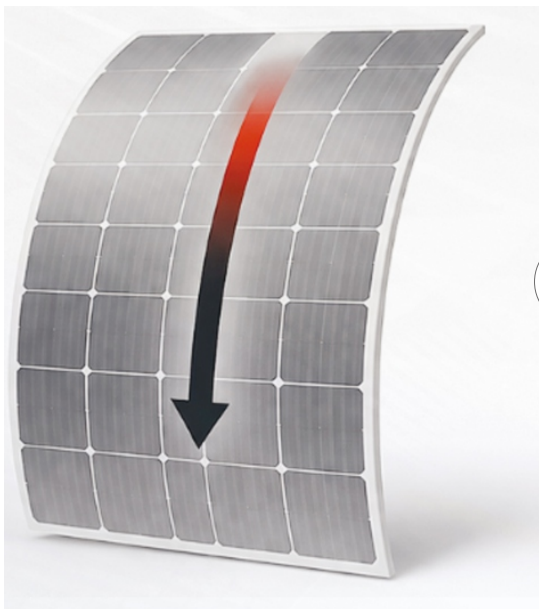
Why conventional panels degrade



Stress builds up at localized points.

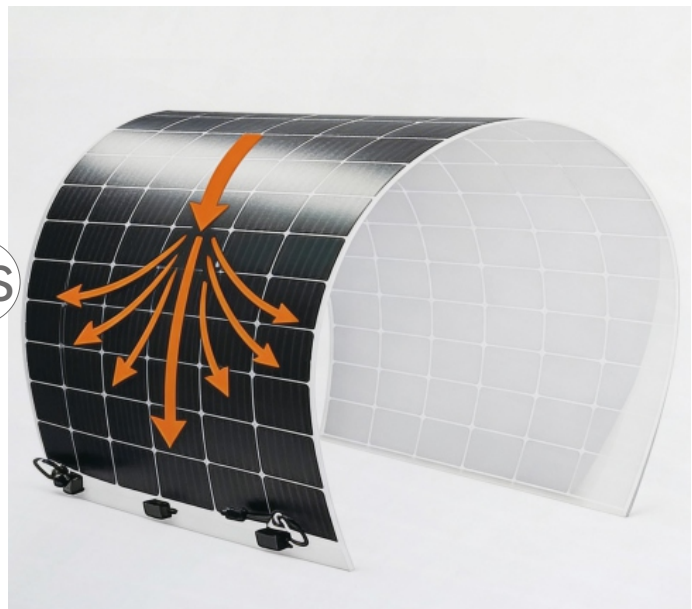
Stress distribution vs. concentration

Load is distributed across the structure,
reducing stress concentration
and slowing crack propagation.



Stress Concentration
Failure starts here

VS



Reduced weak-
point stress

Validated in real-world conditions

Vibration

Withstands motion
with reduced internal fatigue

Bending

Distributes stress across curved surfaces

Drop

Absorbs impact without structural failure

Lab tests don't reflect real-world stress.

Built for Real Mobile Energy Systems

Different environments. One requirement: structural reliability.
Because real-world stress is never uniform.



Different environments.
Same stress logic.



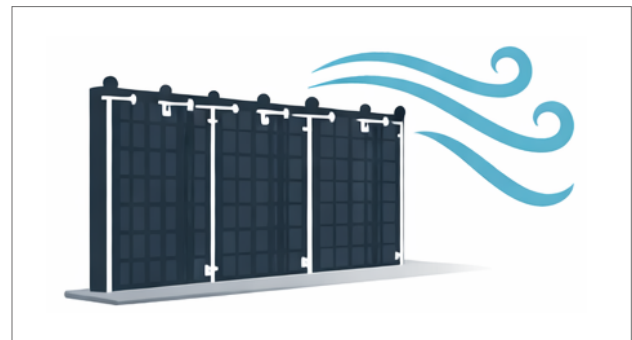
RV → Vibration
→ **fatigue accumulation**



Marine → Corrosion + vibration
→ **degradation & fatigue**



Portable → Impact
→ **stress spikes**



Balcony → Wind-induced motion
→ **cyclic fatigue**

If the structure fails,
power fails first.

Two Architectures. One Purpose: Controlling Stress in Real-World Systems

For Curved Integration
Continuous stress environment



Designed to distribute stress
across curved structures



For Portable Deployment
Discrete impact environment



Engineered to absorb impact
and reduce structural damage



Stress cannot be
eliminated.
It must be controlled.

Flexible Panels (USF) **Primary Structure for Stress Distribution**

Engineered to distribute stress
across curved structures

- Prevents localized stress concentration
- Reduces crack initiation
- Maintains stability under vibration

Result:

- Reduced crack initiation
- Stable performance under vibration

Portable Panels (UT / UB / UC) **Designed for Impact & Field Handling**

Engineered to absorb impact
and maintain structural integrity

- Handles drops and handling stress
- Reduces structural damage
- Improves field reliability

Result:

- No structural damage observed in drop testing
- Reliable performance in field use

Flexible Panels

Designed for Structural Stress Distribution

Reduced stress concentration.
Lower risk of early failure.



Configurations built on stress-distribution architecture

Model No	Type	Power(W)	Vmp / Imp	Size(mm)	Weight(kg)	Typical Use
Continuous vibration & structural flex						
USF-100H	Full Black	100W	20V/5A	967*600*3.5	2.1	Premium RV/Camper
USF-110H	Full Black	110W	17.5V / 6.29A	1382*784*3.5	2.3	Premium RV/Camper
USF-150H	Full Black	150W	20.5V/7.3A	1247*621*3.5	2.5	Premium RV/Camper
USF-200H	Full Black	200W	20V/10A	1382*784*3.5	3.8	Premium RV/Camper
USF-220H	Full Black	220W	17.5V / 12.58A	1485*804*3.5	4.1	Premium RV/Camper
Wind-induced cyclic stress & fatigue						
USF-135s	Full Black	135W	11V/ 12.27A	1002*792*3.5	2.8	Balcony kits, flat installs
USF-135sb	Bifacial	135W	11V/ 12.27A	1002*792*3.5	2.8	Balcony kits, flat installs
USF-200s	Full Black	200W	16.5V/12.12A	1160*1002*3.5	4.0	Balcony kits, flat installs
USF-200sb	Full Bifacial	200W	16.5V/12.12A	1160*1002*3.5	4.0	Balcony kits, flat installs
USF-220Hs	Full Black	220W	16.5V/13.3A	1172*990*3.5	4.0	Balcony kits, flat installs

Portable Panels Designed for Real-World Handling Stress

UC / UB / UT Series
Different configurations.
Same structural logic.



● **UC Series** (Handling & Abrasion)

Fabric-Based | Flexible & Abrasion-Resistant
20W–400W
Rubber handle
Fabric + CPC composite structure
Handles repeated handling stress and surface abrasion

● **UB Series** (Load & Deployment Stability)

Fabric-Based | Structured Portable Systems
60W–220W
Plastic handle
Fabric + CPC stitched construction
Maintains structural stability under load and deployment stress

● **UT Series** (Water Sealing & Harsh Conditions)

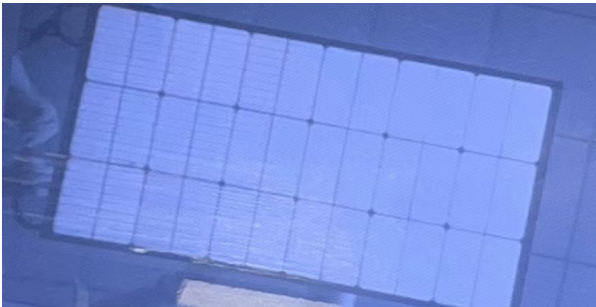
Laminated Structure | Fully Sealed & Waterproof
20W–400W
Handle varies by size
Full ETFE laminated structure
Designed to resist water ingress and preserve structural integrity

**If the structure holds, performance follows.
If it doesn't, power is the first thing you lose.**

Proven Under Continuous Vibration and Handling Stress

Hidden losses may already be happening

Internal micro-cracks are not visible externally
—but directly impact long-term performance



24h continuous vibration test
3.33 Hz | ~288,000 cycles

Power drop: <1.5%

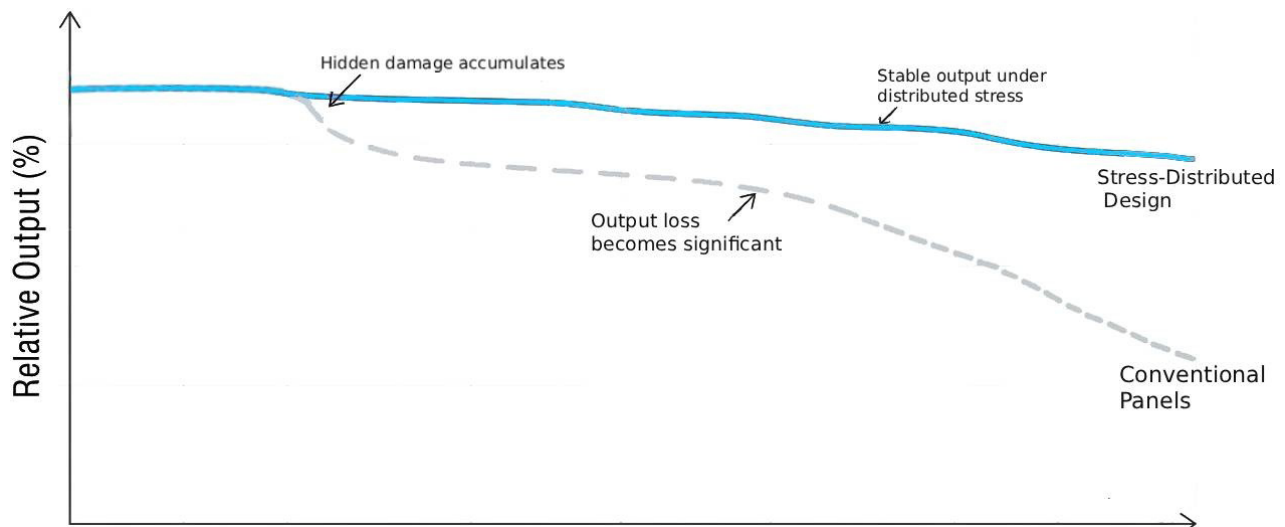
No crack propagation observed

• Conventional Panels

- Stress concentrates
- Cracks propagate
- Performance drops

• Our Structural Design

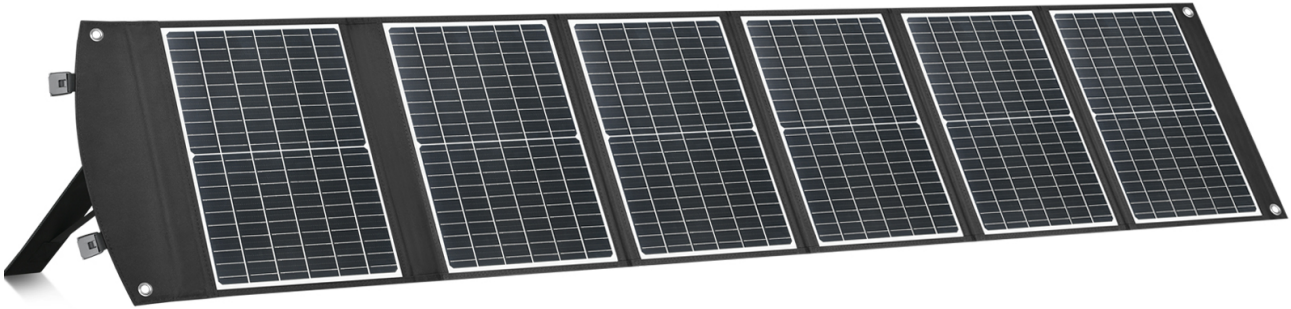
- Stress distributed
- No crack propagation
- Stable output



Validated in Real-World Mechanical Stress Conditions

Performance loss starts before failure is visible.

Portable Fabric-Based Panels Designed for Handling & Surface Stress



UC / UB Series

Same structural concept. Different handling configurations.

● UC Series

Frequent handling & mobility

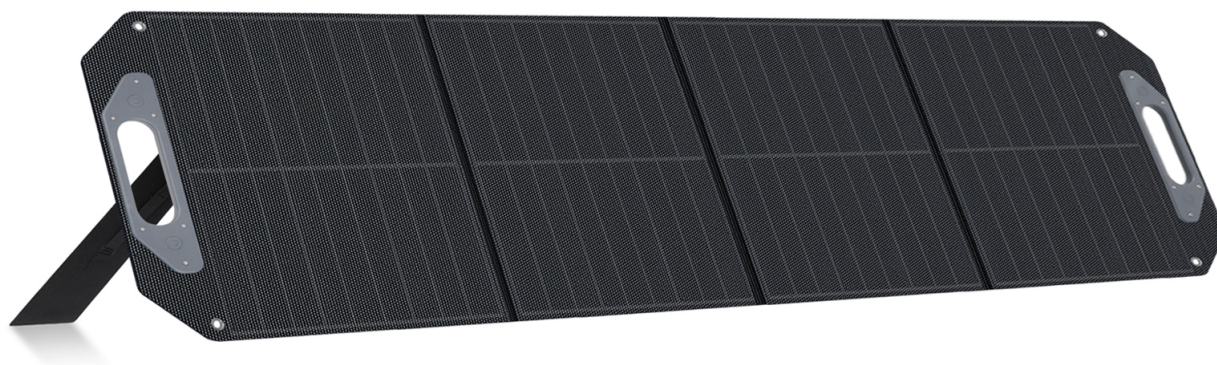
Model	Power	Open /Folded Size (mm)	Weight	Output	Typical Use
UC20W	20W	737 x 186 x 17 / 186 x 90 x 55	0.5kg	USB 5V /3A	Device charging
UC40W	40W	1015 x 245 x 17 / 245 x 125 x 53	0.83kg	24W * PD30W	Multi-device
UC60W	60W	1235 x 205 x 5 / 320 x 205 x 60	1.6kg	DC18V / 3.3A * 24W * PD30W	Small power stations
UC100W	100W	1715 x 400 x 25 / 400 x 265 x 75	2.7kg	DC20V / 5A * 24W * PD45W	Power station charging
UC200W	200W	2650 x 460 x 25 / 460 x 415 x 75	4.8kg	DC20V / 10A * 24W * PD45W	High-output portable
UC400W	400W	3690 x 665 x 25 / 665 x 570 x 75	9.2kg	DC40V / 10A	High-capacity systems

● UB Series

Stable deployment under load

Model	Power	Open /Folded Size (mm)	Weight	Output	Typical Use
UB110H	110W	1143 x 585 x 25 / 570 x 585 x 45	3.5kg	DC17V / 6.4A * 24W * PD45W	Power station charging
UB220H	220W	2145 x 585 x 25 / 570 x 585 x 55	6.1kg	DC17V / 12.9A * 24W * PD45W	High-capacity systems

Fully Laminated Waterproof Panels Designed for Harsh & Marine Environments



Sealed structure. Stable under water, impact, and environmental stress.

● UT Series

Full ETFE laminated structure * IP67 waterproof * Water-ingress resistant

Model	Power	Open / Folded Size (mm)	Weight	Output	Typical Use
UT15H	15W	439 x 211 x 16 / 211 x 106 x 25	0.3KG	5V / 2A	Wet environments
UT25H	25W	473 x 344 x 16 / 176 x 117 x 40	0.42KG	5V / 3A	Outdoor exposure
UT30H	30W	829 x 211 x 16 / 211 x 205 x 23	0.5KG	24W * PD20W	Harsh conditions
UT45H	45W	625 x 422 x 16 / 210 x 155 x 40	0.7KG	24W * PD30W	Field use
UT60H	60W	829 x 383 x 16 / 383 x 205 x 24	0.9KG	DC18V / 3.3A * 24W * PD30W	Outdoor systems
UT80H	80W	846 x 534 x 16 / 210 x 267 x 40	1.2KG	DC22.5V / 3.5A * 24W * PD60W	Harsh conditions
UT100H	100W	1409 x 396 x 22 / 396 x 390 x 40	2.4KG	DC20.5V / 4.8A * 24W * PD60W	Marine environments
UT120H	120W	1737 x 398 x 22 / 398 x 471 x 40	3.1KG	DC18V / 6.6A * 24W * PD45W	Marine systems
UT150H	150W	1739 x 458 x 22 / 458 x 473 x 40	3.4KG	DC20.5V / 8.0A * 24W * PD60W	Off-grid use
UT200H	200W	1739 x 602 x 22 / 602 x 473 x 40	5.3KG	DC20.5V / 9.7A * 24W * PD60W	Continuous outdoor use

Built for OEM & System Partners

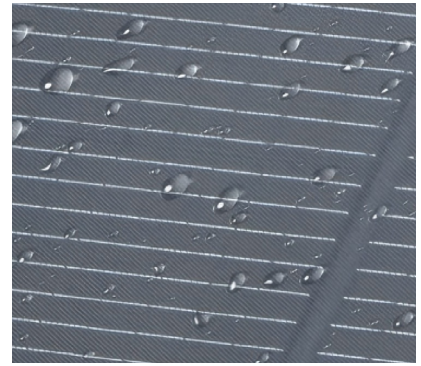
Support beyond the panel — from selection to long-term supply.



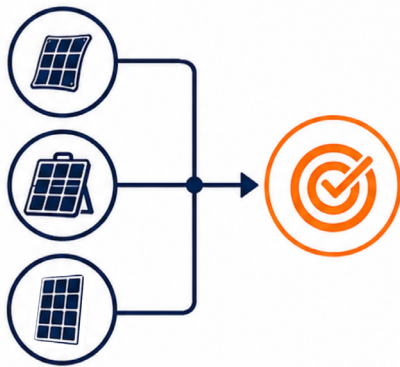
Flexible Panels
For curved rooftop integration



Fabric-Based Portable Panels
For mobile power deployment



Waterproof Portable Panels
For harsh & marine environments



Custom Product Matching

Power, size, and structure options
for RV, marine, balcony,
and portable energy systems.



Engineering Support

Test data, EL imaging,
and application guidance
available for project evaluation.



OEM Program Support

Structured support for
product selection, customization,
and long-term supply programs.

**From product selection to long-term reliability,
we support mobile solar system builders.**

Ask These Before You Choose for Mobile Systems



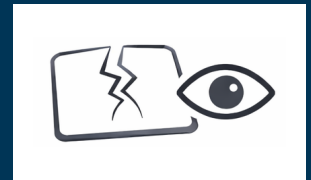
Can it handle vibration?



How is stress distributed
under bending?



What happens after
thermal cycling?



Is degradation visible —
or hidden?

**Most panels pass tests.
Few are designed for what happens after.**

Get the full engineering test data

Scan to access:



Scan to watch
"Drop Test" video



Scan to watch
"Bending Test" video



Scan to watch
"Vibration Test" video

Shenzhen Sola-E Technology Co., Ltd
www.sola-e.us
info@sola-e.us