DINGXIU SOLAR

WATER-BALLASTED MOUNTING
HEBEI, CHINA · EXPORT WORLDWIDE

PATENTED · CMA / CNAS TESTED

Mount solar without putting a single hole in the roof.

A hollow HDPE tank that becomes the ballast. Carry it up empty at 6.3 kg, fill it on site, and each unit turns into 120 kg of water weight holding the array down.



Completed array on an existing waterproofed roof — no penetrations, no ballast blocks, no crane.

6.3 kg	120 kg	12 days	197 sets
EMPTY WEIGHT PER UNIT	WATER BALLAST WHEN FILLED	INSTALL PER MW VS 30 DAYS	PER 20GP CONTAINER

01 · PRODUCT OVERVIEW

A ballast that arrives empty and weighs 120 kg by lunchtime.

The system is a closed hollow HDPE tank that acts as both the support structure and the counterweight. Water is the only ballast medium — no sand, no gravel, no concrete blocks. Water is available on any site, costs nothing, and drains out when you need to move the array.

How it works

01 **Position the tanks.** Carry them up empty at 6.3 kg each — two people move a full row without equipment.

02 **Lay the modules.** The tank sits under the module joint, so two modules share one unit.

03 **Clamp with one hand.** Middle clamps on the shared edge, end clamps on the outer frame, one bolt each.

04 **Fill with water.** The array becomes self-weighted. Nothing is fixed to the roof structure.



Single unit carrying one module at approx. 5° tilt

Units per row = modules + 1

Adjacent modules share the tank at the seam. A row of 20 modules needs 21 units. This single rule is all your installer needs to order.

Against a conventional drilled system

ITEM	DRILLED / CONCRETE BALLAST	DINGXIU WATER BALLAST
Roof waterproofing	Penetrations cut the membrane, repair is required and warranty claims follow	**Zero penetrations. Membrane untouched, existing warranty intact**
Crew	Certified installers familiar with the rail system	**General labour. No system-specific skill**
Lifting equipment	Crane or hoist for concrete blocks and rails	**Manual carry. 6.3 kg per unit, no machinery**
Later modification	Dismantling damages rails and anchors, effectively scrap	**Drain, lift, relocate. Fully reusable**
Roof load	Concentrated point loads at anchors and block positions	**Distributed over the tank footprint, low bearing pressure**

Where it fits: concrete flat roofs · industrial and commercial rooftops · level ground · existing waterproofed membranes where drilling is prohibited · rooftops where a crane cannot reach.

02 · SYSTEM & SPECIFICATION

Four parts. Nothing to assemble on the roof.

System composition

PART	FUNCTION
Float body	Blow-moulded HDPE hollow tank. Becomes both support and counterweight once filled.
Middle clamp	Clamps the adjacent frames of two neighbouring modules on their shared edge.
End clamp	Clamps the outer frame of modules at the array edge.
Bolt	Fastens clamp to tank. Single-hand tightening, no torque tool required.

Ordering rules

Units per row	**modules in that row + 1**
End clamps	**units × 2**
Middle clamps	**units × 2 − end clamps**
Clamp size	**by module frame thickness**

Modules are mounted in portrait. The tank sits under the joint between two adjacent modules, tilted approx. 5°.

Main specification

Material	**HDPE, blow-moulded one piece**
Empty weight	**approx. 6.3 kg**
Filled weight	**approx. 120 kg of water**
Outside dimensions	**1450 × 410 × 200 / 310 mm**
Cavity volume	**approx. 0.16 m³ per unit**
Stacked pair volume	**approx. 0.32 m³**
Stacking density	**approx. 6 sets per m³**
Ballast medium	**clean water only**
Mounting tilt	**approx. 5°**
Module orientation	**portrait**
Fixing to roof	**none — self-weighted**

How many sets does 1 MW need

MODULE SIZE	MODULES PER MW	MODULES PER ROW	SETS PER ROW	TOTAL SETS, APPROX.
550 Wp	≈ 1 818	20	21	**1 920**
580 Wp	≈ 1 724	22	23	**1 815**
620 Wp	≈ 1 613	20	21	**1 710**

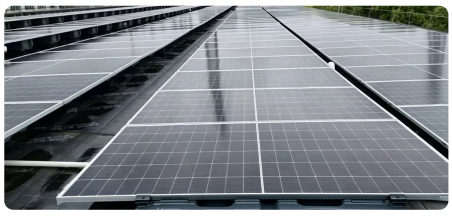
Assumes an ideal rectangle. Real roofs lose rows to setbacks, skylights and walkways, so add 3–5%. We issue an exact layout and quantity count from your roof drawing before you order — free of charge.



Units positioned, rows ready for modules



Module clamped, 6.3 kg per empty unit



Filled and commissioned, no roof fixings

03 · TESTING & CERTIFICATION

Every claim below has a report number behind it.

The product is tested by Tianjin Bailun Inspection & Testing, a third-party laboratory holding both CMA and CNAS accreditation, and by the Hebei Gengqiang New Energy laboratory for pull-out strength. Report numbers can be verified with the issuing body.

1000 hours

UV AGEING · PASS

GB/T 16422.3-2022, UVA-340 lamp, 8 h light at 60 °C + 4 h condensation at 50 °C, 84 cycles. No cracking, no chalking, no significant colour change.

−40 °C × 168 h

COLD · PASS

Stored at −40 °C for 168 hours. No damage, no cracks, no surface defects. Suitable for cold-climate winter operation.

105 °C × 200 h

DRY HEAT · PASS

Stored at 105 °C for 200 hours. No significant surface defects. Withstands summer rooftop heat.

200 cycles

THERMAL CYCLING · PASS

IEC 61215-2:2016 MQT 11 reference, −40 °C to +85 °C, 200 cycles. No significant surface defects.

0.55 kN/m²

Pull-out test including elevated temperature. No tearing and no failure at the clamp. Result: **PASS**. Report JTTR-PZ-A-04-003.

EQUIVALENT WIND SPEED

≈ 30 m/s

108 km/h · Beaufort 11

What 0.55 kN/m² means in wind speed

WIND SPEED	DYNAMIC PRESSURE	BEAUFORT	AGAINST THE TESTED 0.55 KN/M²
20 m/s (72 km/h)	0.245 kN/m²	8	**Within tested range**
25 m/s (90 km/h)	0.383 kN/m²	10	**Within tested range**
30 m/s (108 km/h)	**0.551 kN/m²**	11	**At the tested limit**
35 m/s (126 km/h)	0.750 kN/m²	12	**Above tested range — ask us**
40 m/s (144 km/h)	0.980 kN/m²	12+	**Above tested range — ask us**

Conversion uses $q = 0.5\,\rho\,v^2$ at standard air density $\rho = 1.225$ kg/m³ (15 °C, sea level). Compare this table with the design wind speed your local code requires for the building. Inside the tested range the system fits mechanically; above it, we quote additional units or a different configuration. Final ballast sizing is issued per project.

Factory quality control

01 · Incoming
Virgin HDPE resin inspected on arrival

02 · Process
Blow-moulding parameters monitored inline

03 · Seal
Water-tightness and pressure sample tested

04 · Dispatch
Appearance and dimensions checked per unit

04 · ADVANTAGES

Eight reasons the second project is easier than the first.

01

No roof damage

Water ballast replaces ground screws and expansion bolts. The waterproofing membrane is never opened, so the roof warranty you are responsible for stays intact.

02

Half the schedule

About 12 days per MW against roughly 30 for a drilled system. Grid connection arrives earlier, and earlier connection is the only advantage that shows up directly in the IRR.

03

Four-step install

Position, lay, clamp, fill. No rail cutting, no alignment jigs, no torque specification. General labour can do it after ten minutes of instruction.

04

Light to carry

6.3 kg empty. Two people move a whole row by hand — no crane, no hoist, no scaffold, which matters on a finished industrial roof.

05

Any module

Fits any framed module. Only the clamp profile changes with frame thickness, so you are not locked to one module brand.

06

Reusable

Drain and lift. Useful for roof maintenance access, array reconfiguration, or relocating the plant — the asset moves with you instead of being scrapped.

07

Weather proven

HDPE body with a UV stabiliser system, validated by 1000 h UV ageing, −40 °C cold, 105 °C dry heat and 200 thermal cycles.

08

Dense to ship

Tanks nest in pairs at about 6 sets per m³. 197 sets fit a 20GP, 350–400 fit a 40HC. Per-set freight drops accordingly.

Where the saving comes from — 1 MW rooftop, itemised

COST LINE	DRILLED SYSTEM	WATER BALLAST	SAVING PER MW
Mounting material	≈ ¥0.20 /W	≈ ¥0.20 /W	roughly equal
Concrete ballast blocks + crane	¥30 000–45 000	none	**¥30 000–45 000**
Membrane repair after drilling	¥10 000–15 000	none	**¥10 000–15 000**
Install labour (18 days shorter)	specialist crew	general labour	**¥15 000–25 000**
Typical total	—	—	**¥55 000–85 000**

Ranges reflect north China labour and material rates in 2026 for a 1 MW distributed rooftop. Replace the unit rates with your own local figures — the structure of the saving does not change: you are buying labour, lifting and waterproofing repair, not steel. In markets where skilled installers are scarce or wages are high, the gap widens.

Lead time. 200 sets ex-works in 10–15 days; full container loads 20–25 days. Tell us the target vessel and we plan production backwards from it.

What we send free. Layout drawing, quantity count from your roof plan, wind calculation basis, datasheet, and the full test reports on request.

05 · LOGISTICS

It ships as air, not as steel.

An empty tank is mostly void, so the whole product is volumetric cargo. Tanks nest in pairs, which is why the per-set freight cost is low even on long routes.

VEHICLE	CAPACITY
13 m flatbed truck	**450 sets** (weighed at loading)
9 m truck	≈ 235 sets
6.5 m truck	≈ 140 sets
20GP container	**197 sets** (weighed at loading)
40GP container	≈ 350–360 sets
40HC container	**≈ 400 sets**

Stacked pair ≈ 0.32 m³, single set ≈ 0.16 m³, about 6 sets per m³. A 40HC at 400 sets weighs roughly 2.5 t gross of product — the container cubes out long before it weighs out.

Delivery sequence

01 Order
Quantity confirmed, production slot booked

02 Produce
Batch moulded, inspected per unit

03 Ship
Container loaded, documents issued

04 Support
Remote install guidance on arrival

Send us your roof plan

Roof area, module wattage and rows per array is enough. We return a layout drawing, the exact set count and a quotation — normally within one working day.

CONTACT

Talk to the factory, not to a marketplace listing.

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Message us — replies within one working day

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Patent 202630294473.0 · Tested by Tianjin Bailun (CMA / CNAS) report BL9B936C52 · Pull-out JTTR-PZ-A-04-003 · Specifications subject to the product actually supplied · Reports available on request