



Walk in Cold Room Interest Group 8 September 2026

Off-grid, grid connected and hybrid



VeraSol

Agenda for Third Meeting, 8 September 2026



Introductions

PART I: Using the WICR test protocols and product information template

- The VeraSol approach
- WICR Product Information Sheet template
- Field test methodology
- Lab test methodology

PART II: Discussion

- Q & A
- Other initiatives on WICR
- Next steps for test method:
 - Solar PV
 - Defrost
 - Thermal energy storage

Introductions to our team and the VeraSol programme

Sonja Mettenleiter	(Nairobi)
Jeremy Tait	(Germany)
Sally Musonye	(Nairobi)
Anna Wright	(Washington, DC, USA)
Christopher Carlsen	(Quebec, Canada – unable to attend today)



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**VeraSol is a quality assurance program
for modern off-grid solar solutions**



**Solar Energy
Kits**



**Refrigerators
& Freezers**



**Walk-In Cold
Rooms**



Solar Milling



**Electric
Pressure
Cookers**



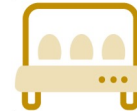
**Large PV
Systems & Public
Institutions**



Fans



**Solar Water
Pumps**



Egg Incubators



Solar Generators

5

Elements of VeraSol Quality Assurance Framework



VeraSol is a quality assurance program that supports high-performing, durable off-grid solar solutions.



data.VeraSol.org

VeraSol Quality Assurance Framework



CERTIFICATION

Evaluate and confirm products meet quality standards

QUALITY STANDARDS

Determine and set baseline levels of product quality

TESTING & DATA

Generate product performance and quality data to inform actions

TEST LAB CAPACITY

Identify and support testing partners to provide testing services

TEST METHODS

Define how product quality and performance is measured

PART I:

**a) Overview of the VeraSol
approach to WICR quality**

Anna Wright

Why QA for WICR?



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1. Ensure Performance & Reliability

- Protect perishable goods with consistent temperature control
- Reduce breakdowns and downtime

2. Safeguard Investments

- Cold rooms are high-value assets
- Quality assurance lowers lifecycle costs and ensures durability

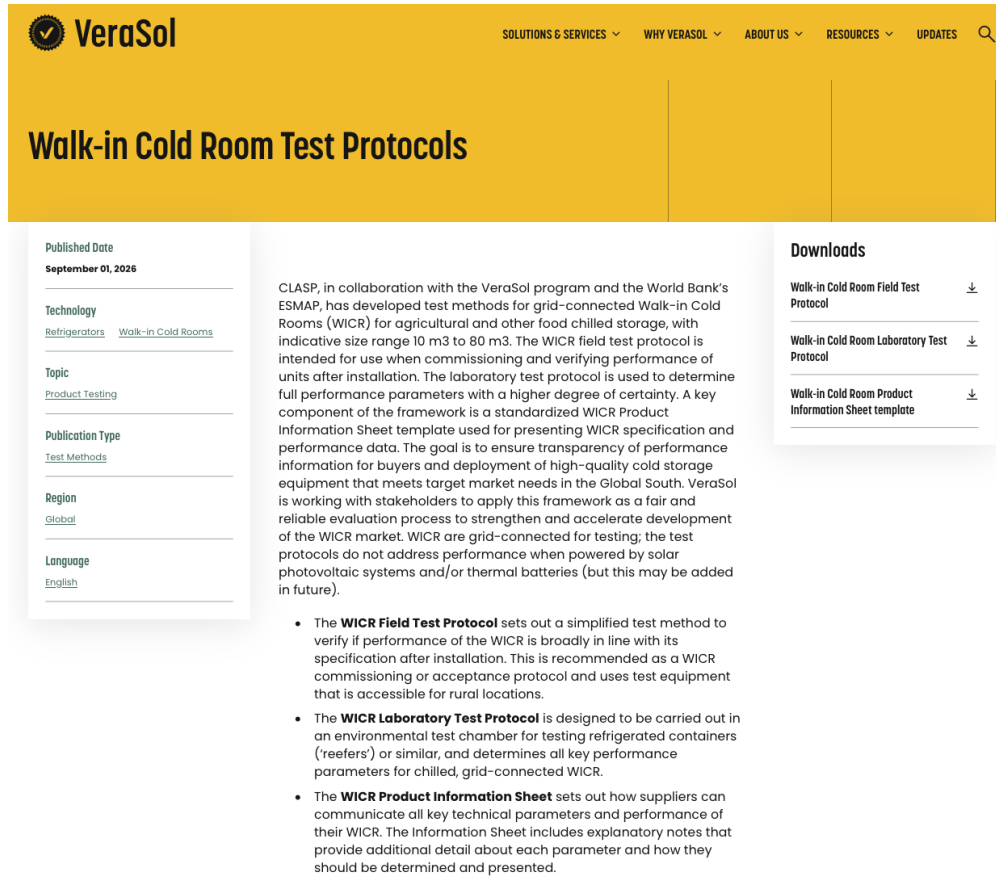
3. Support End-User Confidence

- Farmers, distributors, and businesses can trust WICRs to deliver
- Builds market reputation for suppliers and installers

4. Enable Market Growth

- Standardized quality benchmarks foster fair competition
- Supports wider adoption of cold storage solutions in off-grid and weak-grid areas

Documents now available on the VeraSol website



VeraSol SOLUTIONS & SERVICES WHY VERASOL ABOUT US RESOURCES UPDATES

Walk-in Cold Room Test Protocols

Published Date
September 01, 2026

Technology
[Refrigerators](#) [Walk-in Cold Rooms](#)

Topic
[Product Testing](#)

Publication Type
[Test Methods](#)

Region
[Global](#)

Language
[English](#)

CLASP, in collaboration with the VeraSol program and the World Bank's ESMAP, has developed test methods for grid-connected Walk-in Cold Rooms (WICR) for agricultural and other food chilled storage, with indicative size range 10 m3 to 80 m3. The WICR field test protocol is intended for use when commissioning and verifying performance of units after installation. The laboratory test protocol is used to determine full performance parameters with a higher degree of certainty. A key component of the framework is a standardized WICR Product Information Sheet template used for presenting WICR specification and performance data. The goal is to ensure transparency of performance information for buyers and deployment of high-quality cold storage equipment that meets target market needs in the Global South. VeraSol is working with stakeholders to apply this framework as a fair and reliable evaluation process to strengthen and accelerate development of the WICR market. WICR are grid-connected for testing; the test protocols do not address performance when powered by solar photovoltaic systems and/or thermal batteries (but this may be added in future).

Downloads

- [Walk-in Cold Room Field Test Protocol](#)
- [Walk-in Cold Room Laboratory Test Protocol](#)
- [Walk-in Cold Room Product Information Sheet template](#)

- The **WICR Field Test Protocol** sets out a simplified test method to verify if performance of the WICR is broadly in line with its specification after installation. This is recommended as a WICR commissioning or acceptance protocol and uses test equipment that is accessible for rural locations.
- The **WICR Laboratory Test Protocol** is designed to be carried out in an environmental test chamber for testing refrigerated containers ('reefers') or similar, and determines all key performance parameters for chilled, grid-connected WICR.
- The **WICR Product Information Sheet** sets out how suppliers can communicate all key technical parameters and performance of their WICR. The Information Sheet includes explanatory notes that provide additional detail about each parameter and how they should be determined and presented.



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Published at
www.verasol.org
search "WICR" to find them.

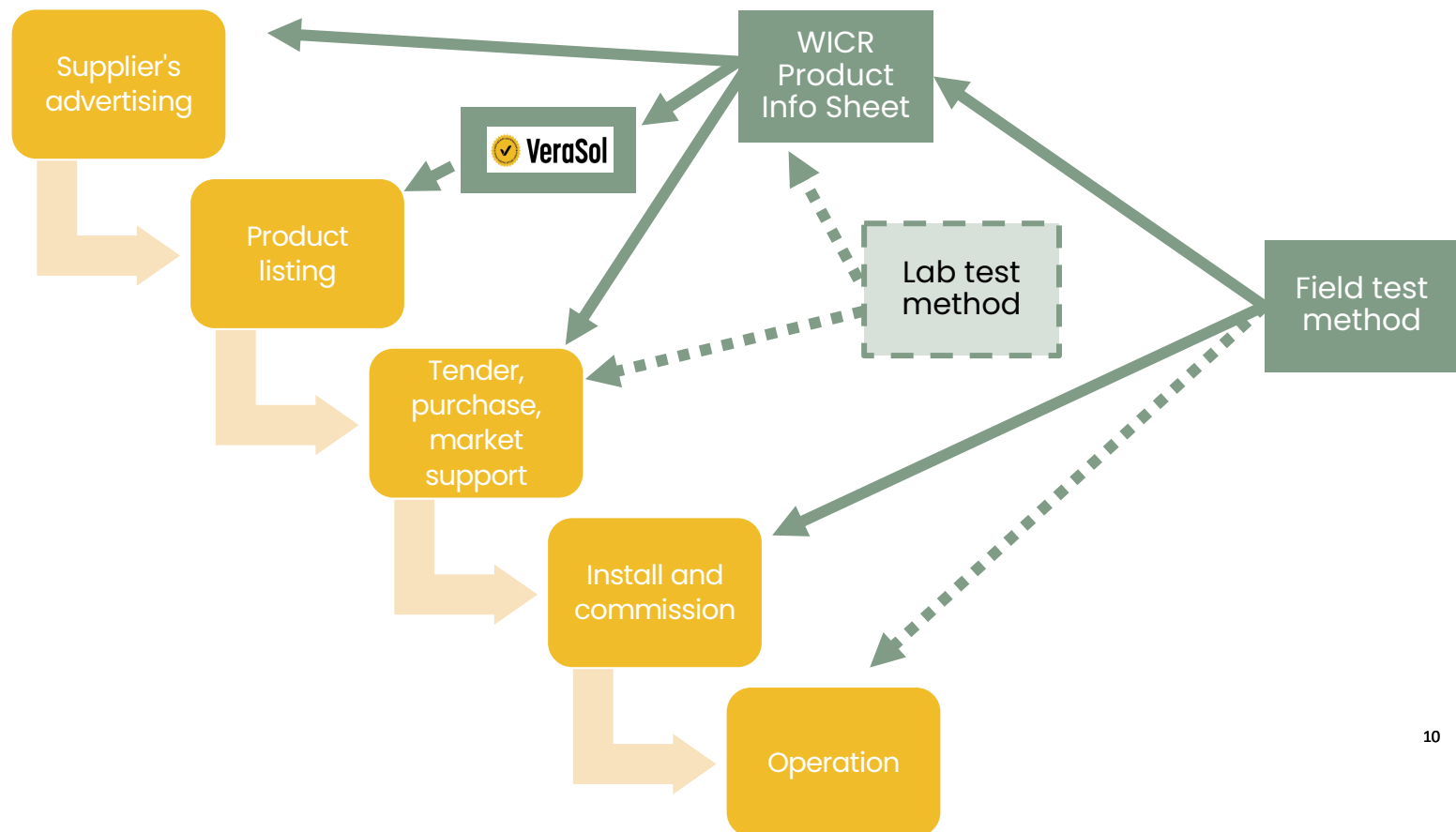
Or use QR:



<https://verasol.org/publications/walk-in-cold-room-test-protocols/>

1. WICR Product Information Sheet template
2. Field Test protocol
3. Lab Test Protocol

Potential roles of VeraSol documents in WICR supply



PART I:
**b) The WICR Product
Information Sheet template**

Jeremy Tait



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<https://www.ronseal.com/the-ronseal-brand/the-ronseal-phrase/>



Content of the WICR Product Information Sheet template



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- List of information and useful parameters with guidance on what to write and how to determine values
- Drop-down lists of options for some parameters; mostly free text but follow the guidance
- Explanations and supporting notes invited as well as documents as evidence

Seven information sections:

1. Supplier information
2. Product information
3. General technical specification
4. Cooling function
5. Electrical power sources
6. Energy performance and efficiency
7. Compliance and certification



Using the WICR Product Information Sheet in Practice

Anna Wright



Harmonized product information helps build markets



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**Common
Information**

**Easier
Comparison**

**Better
Decisions**

**Stronger
Markets**



One form, multiple uses



Who?	How can they use standardized product information?
Suppliers	• Communicate product specifications and performance consistently • Demonstrate conformity with requirements
Buyers / procurers	• Define requirements • Compare products • Inform procurement and selection
Program implementers	• Establish eligibility criteria • Screen products
Testing & verification partners	• Identify products and specifications • Inform testing • Compare declared and measured performance
WICR operators / users	• Understand product capabilities • Make informed purchasing and operating decisions
Financiers / investors	• Technical due diligence and assessment of products being financed



Productive Use Financing Facility

Quality assurance that works in practice



Using the WICR Product Information Sheet and field test methods for Productive Use Financing Facility (PUFF) eligibility

Siena Hacker



PUFF expands access—with quality guardrails



RESULTS-BASED FINANCING

**Lower prices. Reach more customers.
Protect end users.**

- Procurement subsidies, enterprise development grants and technical assistance
- Operating in Nigeria, Kenya and Ethiopia through 2028
- WICRs are high-cost systems: weak performance can undermine both customer livelihoods and donor value

For WICRs, eligibility is an evidence-to-decision process



Three possible evidence pathways

Accredited third-party testing • Recognized prior evaluation • Administrator-directed targeted assessment

The same minimum applies across pathways: identity, credible functional performance, basic safety, warranty, and usable installation / operation / maintenance documentation.

The Product Information Sheet makes claims assessable



It turns a complex system into a consistent record of what is being sold, how it should perform, and what evidence supports each claim.

1

Product identity

model, configuration, construction

2

Cooling performance

rated climate, temperature, capacity

3

Energy system

consumption, PV, batteries, autonomy

4

Safety

risk controls, electrical and refrigerant safety

5

Durability

insulation, enclosure, components, maintenance

6

Consumer protection

warranty, price, service and spare parts

7

Environmental safeguards

refrigerant, blowing agent, end-of-life

Design rule learned in practice

Ask for units, rated conditions and supporting uploads beside the claim—not in a separate document hunt.

Real submissions exposed gaps between claims and evidence



Model traceability

Do photos, datasheets, certificates and the proposed unit describe the same product?

Internal consistency

Do dimensions, capacity, power and component claims agree across documents?

Rated conditions

At what ambient temperature and operating state were claims determined?

Evidence relevance

Does a certificate substantiate the claim—or only a component, standard or calculation?

These gaps led to clarification rounds—and strengthened the form and guidance.

Field tests connect declared performance to installed reality



DOCUMENT REVIEW

What should be true

- Declared temperature range and rated climate
- Cooling and energy performance claims
- System configuration, controls and safeguards



FIELD PERFORMANCE

What happens on site

- Commission correctly and identify setup issues
- Measure temperature, cooling and energy use
- Verify performance under actual operating conditions

For PUFF, the field method can support commissioning, conditional approvals and post-installation performance verification.

A promising approach depends on disciplined implementation



WHAT IS WORKING

- ✓ A common structure for complex WICR submissions
- ✓ Earlier visibility into technical and consumer-protection risks
- ✓ A defensible basis for clarification and conditional approval
- ✓ A product record that can inform procurement and later verification

WHAT WE ARE STILL IMPROVING

- ! Suppliers may need support to provide rated, model-specific evidence
- ! Forms can become burdensome if every field is treated as a pass/fail gate
- ! Technical judgment and review ownership must be consistent
- ! Product or component changes require active change control

Our goal: enough evidence to protect customers and grant funds—without making QA a barrier to promising products entering the market.

PART I: c) The new WICR field test protocol

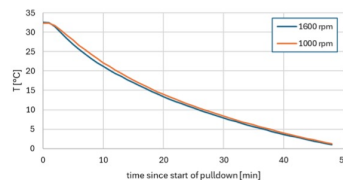
Sonja Mettenleiter

Overview of the VeraSol WICR field test protocol

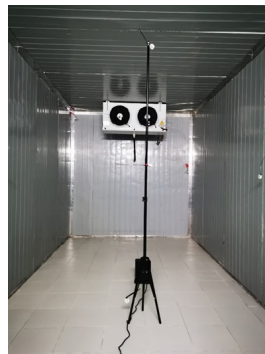


Based on the ATP protocol for testing refrigerated containers, and a WICR test method from India

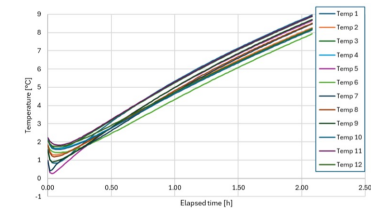
- 1. Empty pull-down** test from ambient temperature to the target storage temperature according to the cold room category



- 2. Steady state effectiveness** test with fan heaters inside: temp. stability, energy consumption, cooling capacity, COP



- 3. Autonomy** test: switch off the cooling and measure time taken for average temp. to rise by 5°C



- 4. Heat leakage** test (k-value): steady state with fan heater inside, adjusted to a target temperature difference inside/outside -> calculate k-value

$$K = \frac{W}{S \cdot \Delta T}$$

Equation 1: K value

Overview of the field tests and equipment



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Test	Contents of WICR storage volume	WICR internal air (storage) temperature at start	Representative heat load
Visual inspection of insulated enclosure and key components in the field	Empty	n/a	n/a
Empty Pull-Down Field Test	Empty	Equal to climate zone temperature/ ambient temperature	None
Autonomy test	Empty	At target storage temperature	None
Steady state effectiveness for air temperature, representative energy consumption, representative cooling capacity and maximum cooling capacity	Empty, with heaters and fans as needed	At target storage temperature	Yes, as per 4.5 in the test method document
Determination of heat leakage rate and k-value of the insulated enclosure	Empty	See Table 8 in the test method document	None

Test equipment:

- Min. 5 temperature sensors
- Min. 1 humidity sensor
- Data logger
- Electrical power meter
- Support rig(s) to hold sensors at suitable heights and locations
- Handheld temperature sensor
- Multi-meter (for checks and troubleshooting during set up)
- Adhesive tape
- Flash light
- Stopwatch
- Camera to record test set up
- Tape measure
- Adequately powered heater
- Extension cable



The field test in practice:

Insights from
Carren Atieno (Kijani Testing Ltd.)
&
Dennis Onkangi (Kuza Freezer)





Field-Testing the VeraSol WICR Protocol

What stands out-Kijani Perspective

- **Simple, locally available tools**

No specialized or imported equipment: temperature/humidity sensors, an electric fan heater, an energy meter, a camera, and a Fluke infrared sensor for pre-test distribution checks.

- **Clear, plain-language protocol**

Steps are written in accessible language, so a field team can follow them without needing a lab-technician background.

- **Extensive photo documentation**

Thorough enough to support the report, but demanding it takes two people to manage cables, staging, and shots at once.

- **Standardized report outline**

A consistent structure for reporting data and findings, so results from different testers and sites can be compared directly.

- **Meaningful parameters, like the k-value**

Outputs go beyond pass/fail, giving testers real insight into the unit's actual insulation performance taking in account the various climatic conditions reflecting the ideal environmental conditions.

- **Easy to spot faults and errors**

The multiple sensor arrangement surfaces anomalies quickly a mis-placed sensor still cost us a repeat test in Mbita.

Testing a recognized protocol builds capacity, credibility, and repeatability

1

A field-proven capability positions Kijani for more work as adoption grows from commissioning checks to spot audits of registered units.

2

Standardized steps mean results can be trusted and compared directly across sites, testers, and time.

3

Bringing together the suppliers and manufacturer and technical experts during the tests.

Tip

- Keep spare sensors on hand for replacement — placements do fail.
- Secure a stable power supply before you start testing.
- Great to run before commissioning the systems — but also because it requires the cold room to be completely empty, so plan around storage downtime.



Placing a sensor at the evaporator, as a team

Testing Before Launch: From Installation to Performance

Why testing the Homabay Hub changed how we think about cold-chain infrastructure.



DENNIS ONKANGI
Founder & CEO



Solar-powered cold storage facility - www.kuzafreezer.com



BEFORE OPERATIONS

COLD ROOM INSTALLED

Not yet operational
No fish inside
Low operational risk



TESTING

MEASURED
PERFORMANCE

How efficiently?
How consistently?
Under what conditions?



WHAT CHANGED

PERFORMANCE
FOCUSED

Identify weaknesses
Improve operations
Manage risk



We looked beyond “Is it cold?”

Temperature • Energy • Pull-down
• Cooling capacity • Autonomy



We measured, not assumed

Multiple sensors revealed what we couldn't see by simply standing inside the room.



We found opportunities to improve

Door insulation was identified as an area requiring improvement.



PART I: d) The WICR lab test protocol

Jeremy Tait



WICR lab test protocol:

In a thermal chamber (e.g., ATP chamber for refrigerated containers) for a stable and controlled test environment

Comprehensive instrumentation for authoritative results (repeatable, reproducible)

Same tests as field test protocol, plus: pull-down test with dummy load (crates of water bottles), fan air flow test, maximum cooling capacity

Justified for larger scale procurement and certification processes.

PART II: Questions, clarifications, discussion

Jeremy Tait

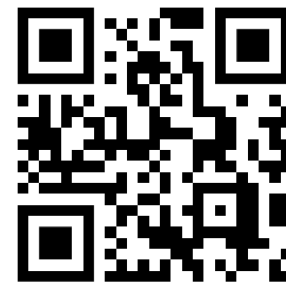
Questions and Discussion



- Please use the Q&A chat function
- Or 'raise your hand' using the Teams icon
- Or you can email us to respond after the webinar:
 - Jeremy Tait (jeremy@taitconsulting.de)
 - Sonja Mettenleiter (sonja@mettenleiter-consulting.com)

Documents at www.verasol.org, search "WICR".

1. WICR Product Information Sheet template
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<https://verasol.org/publications/walk-in-cold-room-test-protocols/>

Further development of test specs



We invite volunteer experts to join small working groups on:

1. Assessment of solar PV systems supplied with the WICR (suitability, field test protocol)
2. Specification and performance of thermal energy storage
3. Performance of defrost system

We anticipate two technical discussion meetings for each group online, during September to November, plus commenting on draft documents.

Please respond to the webinar follow up email if you would like to volunteer for a working group.

Next steps



- **Suppliers:** prepare how you will complete the WICR Product Information Sheet; get field test evidence about performance of your WICR
- **Buyers, procurement managers:** start building these parameters into your procurement specifications and processes; consider the field test protocol for acceptance and commissioning purposes
- **Technical experts:** help us further develop the criteria – get in touch.



Thank You!

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- ✓ [Subscribe to our newsletter](#)



Reach out directly:

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- Sonja Mettenleiter (sonja@mettenleiter-consulting.com)





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WICR Interest Group #3, 8 September 2026

Stakeholder interest group on quality of Walk in
Cold Rooms (WICR). Third meeting.