

INDUSTRIAL CASE STUDY

Solar Collector & Thermal Storage Testing Units

Indoor Solar Simulator & Outdoor Test Yard — Certified Efficiency, Stagnation & Thermal Storage Testing per ISO 9806:2017 / IS 12933

Designed, Engineered & Validated by KERONE Engineering Solutions Limited

4 m ² MAX APERTURE Test Rig Capacity	1200 W/m ² SIMULATOR Peak Irradiance	82.4% PEAK EFFICIENCY η ₀ , Best Collector	500 L MAX TANK VOLUME Storage Test Capacity	7-10 DAYS TURNAROUND vs 45-60 Days External	~1.8 YRS PAYBACK In-House Test Facility
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Project Reference Detail

Field	Detail
Client Organisation	SunTherm Renewable Energy Pvt. Ltd. — Leading Indian solar thermal collector & storage tank manufacturer
KERONE Reference	KRDC/ICS/SolarTest/2025-04 Based on KRDC Lab Report 112/KRDC/LAB/09
Technology	Indoor Solar Simulator Test Rig + Outdoor Natural-Sunlight Test Yard + Thermal Storage Tank Test Bench
Feedstock / Test Articles	Flat-plate & evacuated-tube solar collectors (1-4 m ² aperture); pressurised storage tanks (50-500 L)
Product Output	BIS / MNRE-compliant test certification — Efficiency Curve, Incidence Angle Modifier, Stagnation Temperature, Tank Heat-Loss Coefficient
Facility Location	KRDC Ambernath Test Facility — dedicated outdoor solar test yard + indoor simulator lab
Document Date	July 2026 Validated on KRDC Lab Data — March 2026

Solar Thermal Testing | Collector Efficiency Certification | Thermal Storage Validation | Renewable Energy | Test & Measurement Infrastructure | Chemical / Energy

Executive Summary

SunTherm Renewable Energy Pvt. Ltd., a fast-growing Indian manufacturer of flat-plate and evacuated-tube solar thermal collectors and pressurised storage tanks, faced a commercially significant bottleneck: every new collector or tank design required certification-grade performance testing at an external NABL-accredited laboratory before it could be listed for MNRE subsidy schemes or exported under ISO 9806 / Solar Keymark-equivalent requirements. External lab queues routinely stretched to 45-60 days per test, delaying new product launches and inflating annual testing spend.

KERONE Engineering Solutions Limited was engaged to design, build, and validate an in-house indoor solar simulator test rig, an outdoor natural-sunlight test yard, and a dedicated thermal storage tank test bench, giving SunTherm the ability to generate ISO 9806:2017 / IS 12933-2 quasi-dynamic efficiency curves, incidence angle modifiers, stagnation temperatures, and IS 15084 tank standby heat-loss coefficients entirely in-house.

Following a structured KRDC validation programme conducted on SunTherm's own production units — a 2 m² flat-plate collector (model FPC-2020) and a 300-litre pressurised storage tank — across a matrix of flow rates, irradiance levels, and mean-fluid-temperature conditions, the KERONE test infrastructure reproduced measurable, standards-traceable results: a peak optical efficiency (η_0) of 78.9% on the flat-plate unit and 74.2% on a companion evacuated-tube unit, together with a tank standby heat-loss coefficient of 1.42 W/K — all generated in a 7-10 day in-house cycle versus 45-60 days previously.

CHALLENGE	KERONE SOLUTION	OUTCOME ACHIEVED
Every new collector/tank design was gated by a 45-60 day external NABL lab queue, at INR 18-22 Lakh/yr in third-party fees, delaying product launches and MNRE listing.	Indoor Class-A solar simulator + outdoor test yard + thermal storage tank bench, built and calibrated to ISO 9806:2017 / IS 12933-2 / IS 15084 — validated on KRDC data.	In-house efficiency curves, IAM, stagnation temp & tank heat-loss data in 7-10 days; ~75% cut in annual testing spend; ~50% faster launch cycle.

Key Performance Summary

KPI	Before (External Lab Dependency)	After KERONE In-House Facility	Improvement
Test Turnaround Time	45-60 days (external NABL queue)	7-10 days	5-6x faster
Annual Testing Cost	INR 18-22 Lakh/yr (external fees)	INR ~19 Lakh/yr all-in operating	~75% reduction in marginal cost per test
Collector Types Certifiable	Flat-plate only (via external)	Flat-plate + Evacuated tube + Heat-pipe ETC	Scope expansion
Peak Optical Efficiency (η_0)	Not quantified in-house	78.9% (FPC-2020), 74.2% (ETC-15)	New in-house capability
Tank Standby Loss Coefficient	Not tested in-house	1.42 W/K (300 L tank)	New in-house capability
New Product Launch Cycle	5-6 months (test bottleneck)	2-3 months	~50% faster to market

Table 1: KPI comparison — before and after commissioning of the KERONE in-house test facility

Industry Context & The Business Challenge

India's solar thermal sector — flat-plate and evacuated-tube collectors for domestic, institutional and industrial process-heat applications — continues to expand under MNRE's renewable heating push, with solar water heating systems increasingly specified in green-building codes, hospitality, dairy, and textile process-heat retrofits. Manufacturers seeking MNRE subsidy listing or export qualification must produce standards-compliant performance data: an instantaneous efficiency curve and incidence angle modifier under ISO 9806:2017 (or the equivalent IS 12933-2 quasi-dynamic method), a stagnation temperature record, and — for integrated systems — a storage tank standby heat-loss coefficient under IS 15084.

The structural constraint for Indian manufacturers is testing infrastructure: only a small number of NABL-accredited solar-thermal test laboratories operate nationally, creating queues that routinely run 45-60 days per submission during peak filing seasons. For a manufacturer iterating across multiple collector variants and tank sizes each year, this bottleneck directly throttles new-product launch velocity and adds recurring third-party testing cost to the P&L.

The Commercial Problem — Why External Dependency Constrains Growth

Test Parameter	SunTherm Capability (Before)	Requirement for BIS/MNRE Listing	Gap
Instantaneous Efficiency Curve (η vs $(T_m - T_a)/G$)	Not measurable in-house	Required per IS 12933-2 / ISO 9806:2017	FAIL — dependent on external lab
Incidence Angle Modifier (IAM)	Not measured	Required for annual-yield certification	FAIL
Stagnation Temperature	Estimated only, not measured	Required under no-flow test condition	FAIL
Tank Standby Heat-Loss Coefficient	Not measured	Required per IS 15084	FAIL
Test Report Turnaround	45-60 days (external queue)	Needed within 2 weeks to hold launch dates	Bottleneck

Table 2: SunTherm testing capability vs certification requirement, prior to the KERONE facility | Source: KRDC Analysis, ISO 9806:2017 & IS 12933-2 / IS 15084

Opportunity — Converting a Cost Centre into a Competitive Advantage

At an estimated 180 collector tests and 120 tank tests per year at full utilisation, external lab fees of roughly INR 55,000 per test represented an annual spend of approximately INR 165 Lakh, before accounting for the opportunity cost of delayed launches. Bringing this testing in-house converts a recurring external cost into a owned capability — while also shortening the collector-to-market cycle from 5-6 months to 2-3 months, letting SunTherm respond faster to MNRE scheme deadlines and export enquiries.

About SunTherm Renewable Energy Pvt. Ltd.

SunTherm Renewable Energy Pvt. Ltd. is an ISO 9001:2015-certified manufacturer of flat-plate and evacuated-tube solar thermal collectors and pressurised storage tanks, supplying domestic, institutional and industrial process-heat customers across India and select export markets. The KRDC validation programme was conducted on SunTherm's own production units — a 2 m² flat-plate collector (model FPC-2020) and a 300-litre pressurised storage tank — dispatched to the KRDC Ambarnath test facility in February 2026, to ensure the test protocol and equipment design reflected real production hardware.

Process Validation — From KRDC Test Rig to Certification-Ready Data

KERONE's engineering approach mandates instrument-grade laboratory validation before any test-rig specification is finalised for a client's production environment. The KRDC (Kerone Research & Development Centre) conducted a structured test programme on SunTherm's FPC-2020 flat-plate collector over 5 days, using the indoor Class-A solar simulator across a matrix of reduced-temperature-difference points, to establish the instantaneous efficiency curve and stagnation behaviour that inform the full-scale, multi-bay test facility design.

KRDC Test Programme — Key Findings

Test Point	$(T_m - T_a)/G$ (m ² K/W)	Irradiance (W/m ²)	Mean Fluid Temp (°C)	Efficiency η (%)	Assessment
Near-zero ΔT	0.00	950	32	78.9	Optical efficiency reference (η_0)
Normal operating point	0.02	920	45	71.2	Typical domestic operating condition
Elevated temperature	0.05	900	68	58.4	Process-heat operating condition
High-temperature	0.08	880	92	44.1	Near-stagnation approach
Stagnation (no flow)	0.11	850	195 (stagnation)	0	Stagnation temperature recorded

Table 3: KRDC efficiency-curve test results — flat-plate collector FPC-2020, indoor Class-A simulator | KRDC Test Report 112/KRDC/LAB/09 | Per ISO 9806:2017 quasi-dynamic method

Storage Tank Standby-Loss Test — Key Findings

Test Condition	Soak Duration	Ambient Temp	Initial Water Temp	Temp Drop (24 hr)	Heat-Loss Coeff.	Assessment
Standby loss (IS 15084)	48 hr	20 ± 0.5°C	65°C	5.8°C	1.42 W/K	Meets 5-star-equivalent target (<1.75 W/K)
Stratification profile	6 hr draw-off	20 ± 0.5°C	65°C (top), 22°C (bottom)	N/A	N/A	10-point profile confirms stable stratification

Table 4: KRDC thermal storage tank test results — 300 L pressurised tank | Per IS 15084 standby-loss method

Test Rig Design — Indoor Simulator to Full-Scale Outdoor Validation

Parameter	Indoor Solar Simulator	Outdoor Natural-Sunlight Test Yard	Correlation
Irradiance Source	Xenon-arc solar simulator, Class A	Natural solar irradiance, pyranometer-measured	Cross-validated within ±3%
Collector Size Handled	Up to 2.5 m ²	Up to 4 m ²	Direct scale-up

Parameter	Indoor Solar Simulator	Outdoor Natural-Sunlight Test Yard	Correlation
Test Duration per Point	15-20 min (steady state)	Full-day quasi-dynamic run	Per ISO 9806:2017, Annex methods
Ambient Control	Enclosed chamber, 20 ± 2°C	Ambient (recorded & weather-corrected)	Weather-correction model applied
Fluid Loop	Closed loop, mass-flow controlled	Closed loop, mass-flow controlled	1:1 identical loop design

Table 5: Scale-up methodology — indoor simulator parameters translated to the outdoor test yard design

Test Facility Design — Indoor & Outdoor Test Units

The KERONE test facility is organised as a linear workflow: collector or tank receipt and instrumentation, indoor simulator or outdoor-yard exposure testing, live data acquisition, automated efficiency-curve computation, and certification report issuance. The same DAQ backbone and analysis software serve both the collector test rigs and the thermal storage tank bench, giving SunTherm a single reporting format across its full product range.

Process Flow: Collector / Tank Receiving & Mounting → Instrumentation & Sensor Calibration → Solar Simulator / Outdoor Exposure → Data Acquisition (DAQ) → Efficiency Curve & Heat-Loss Computation → Certification Report Issuance.

System Architecture — Major Test Units

Unit / Section	Equipment	Design Parameters	Function
U-01: Collector Mounting Rig	Adjustable tilt-azimuth frame	0-90° tilt, manual azimuth adjustment	Mount collector at test-specified tilt/orientation
U-02: Solar Simulator	Xenon-arc Class A array	Irradiance 200-1,200 W/m ² , uniformity ±2%	Provide repeatable indoor irradiance for the efficiency curve
U-03: Outdoor Test Yard	Open unshaded platform, pyranometer array	4 mounting bays, tilt 0-60°	Natural-sunlight validation per ISO 9806:2017
U-04: Fluid Conditioning Loop	Chiller + heater + circulation pump	Inlet temp -10 to 120°C, flow 0-6 L/min	Control collector inlet temperature and flow rate
U-05: Data Acquisition System	Multi-channel DAQ, RTDs, flow meters, pyranometers	0.1°C resolution, 1 Hz sampling, 32 channels	Capture temperature, flow, irradiance and wind data
U-06: Thermal Storage Tank Test Bench	Insulated test chamber + standby-loss rig	50-500 L tank capacity, ambient 20 ± 0.5°C	Measure tank standby heat loss and stratification
U-07: Stratification Probe Array	Multi-point thermocouple string	10-point vertical temperature profile	Measure temperature stratification inside the tank
U-08: Wind Simulation Fan Bank	Variable-speed fan array	0-10 m/s adjustable	Simulate wind speed per ISO 9806:2017 requirement
U-09: Data Processing & Reporting	KRDC analysis software + SCADA logging	Automated curve-fitting (η_0 , a_1 , a_2)	Generate the compliant test certificate and efficiency report

Table 6: Process unit descriptions — KERONE Solar Collector & Thermal Storage Test Facility | U-02, U-03 and U-06 are the primary test units

Core Equipment Specification — KRDC Solar Simulator & Test Loop

The KERONE Xenon-arc solar simulator is the heart of the indoor collector test rig. Designed and integrated in-house at KERONE's Ambernath facility, it directly reproduces the validated laboratory irradiance and fluid-loop conditions from KRDC test 112/KRDC/LAB/09 at full production-scale collector dimensions, while the companion outdoor test yard and thermal storage tank bench extend certification coverage to natural-sunlight and system-level testing.

Solar Simulator — Core Specifications	
Irradiated Area	2.5 m x 2.5 m (accommodates up to 4 m ² collector)
Irradiance Range	200-1,200 W/m ²
Spectral Match Class	Class A (per IEC 60904-9, adapted for solar-thermal use)
Spatial Uniformity	± 2% across the test plane
Temporal Stability	Class A (< 2% variation)
Lamp Type	Xenon-arc array, 12 x 6 kW lamps
Fluid Loop Range	-10°C to 120°C inlet, 0-6 L/min flow
Flow Meter Accuracy	± 0.5% of reading (Coriolis-type)
Temperature Sensors	4-wire Pt100 RTDs, ± 0.05°C
Wind Simulation	0-10 m/s, adjustable fan array
Data Logging Rate	1 Hz, 32-channel simultaneous acquisition

Table 7: Core specifications — KERONE indoor solar simulator and fluid conditioning loop

Utilities & Ancillary Requirements

Utility	Specification	Consumption (Full Test Run)	Source
Electrical Power	415V, 3-phase, 50Hz	~95 kW connected, ~60 kW avg demand	Site utility
Chilled Water	7°C supply, closed loop	15 m ³ /hr	Chiller unit
Compressed Air	6 bar dry, instrument grade	10 Nm ³ /hr	Air compressor (site)
Space Requirement	Indoor lab + outdoor test yard	L 20m x W 15m (indoor) + 500 m ² outdoor yard	New shed + open yard

Calibration & Traceability Compliance

Instrument	Calibration Standard	Traceability	Status
Pyranometer	ISO 9060 Secondary Standard	NABL-traceable calibration	COMPLIANT
RTD Temperature Sensors	IEC 60751 Class A	NABL-traceable calibration	COMPLIANT
Flow Meter	ISO 4185	NABL-traceable calibration	COMPLIANT
Solar Simulator	IEC 60904-9 Class-A target	Internal + third-party audit	COMPLIANT

Test Throughput & Energy Analysis — Full-Facility Operation

At full utilisation, the KERONE test facility is sized to process approximately 180 collector tests and 120 tank tests per year, with collector tests averaging 1.5 days per unit (including setup, full efficiency curve, and report issuance) and tank tests averaging 3 days per unit (driven by the mandatory 48-hour standby-loss soak period).

Metric	Value	Notes
Collector Tests / Year	~180 units	At full utilisation, ~300 working days/yr
Tank Tests / Year	~120 units	Limited by 48-hr standby-loss soak cycle
Avg. Test Cycle Time (Collector)	1.5 days	Setup + full efficiency curve + report
Avg. Test Cycle Time (Tank)	3 days	Includes mandatory 48-hr soak period
Utilisation Target — Year 1	70%	Ramp-up phase
Utilisation Target — Year 3	85%	Steady-state operation

Table 8: Test throughput — KERONE Solar Collector & Thermal Storage Test Facility, at full utilisation

Energy Consumption Estimates

Energy Category	Equipment / Unit	Power (kW)	Load Factor	Consumption (kWh/test)
Solar Simulator Lamps	Xenon-arc array (12 x 6 kW)	72	60%	~180
Fluid Conditioning	Chiller + heater + pumps	15	50%	~35
DAQ & Controls	PLC/SCADA + sensor array	3	90%	~12
Wind Simulation Fans	Variable-speed fan bank	5	40%	~8
TOTAL		~95 kW		~235 kWh/test

Table 9: Energy consumption estimate — per full collector test run | KERONE engineering estimate, to be confirmed during detailed engineering

Test Output Specification & Certification Scope

Parameter	Test Method	FPC-2020 Result	ETC-15 Result	Requirement
Optical Efficiency, η_0	ISO 9806:2017	78.9%	74.2%	Reported value; >70% typical for premium grade
Heat-Loss Coeff., a_1 (W/m ² K)	ISO 9806:2017	3.8	1.9	Lower is better; ETC typically outperforms FPC
Heat-Loss Coeff., a_2 (W/m ² K ²)	ISO 9806:2017	0.015	0.008	Lower is better
Stagnation Temperature	IS 12933-2	195°C	232°C	Reported; used for material safety validation
Incidence Angle Modifier (at 50°)	ISO 9806:2017, Annex	0.92	0.95	Reported; used in annual-yield modelling
Tank Standby-Loss Coeff. (300 L)	IS 15084	1.42 W/K	N/A	< 1.75 W/K for 5-star-equivalent rating
Product Grade / Rating	Classification	5-star equivalent	5-star equivalent	—

Table 10: Certification test output — SunTherm flat-plate (FPC-2020) and evacuated-tube (ETC-15) collectors, and 300 L storage tank

Market Applications Enabled by In-House Certification

- **MNRE / Domestic Subsidy Listing** — MNRE subsidy scheme listing for domestic solar water heaters, using in-house-generated efficiency and stagnation data.
- **Industrial Process Heat** — Higher mean-fluid-temperature applications (dairy, textile, hospitality) suited to the ETC-15's lower heat-loss coefficient and higher stagnation margin.
- **Export Certification** — Export qualification to Middle East and African markets requiring ISO 9806:2017 or Solar Keymark-equivalent test data.
- **Storage Tank R&D** — Faster iteration on tank insulation design using the standby-loss and stratification test bench ahead of full-scale tooling commitments.
- **Institutional & Catering** — Institutional and catering segment solar water heating systems where BEE-type 5-star-equivalent tank ratings are a procurement requirement.

Financial Analysis & Return on Investment

Bringing collector and thermal storage testing in-house converts a recurring external cost centre into an owned capability. At an assumed external lab fee of approximately INR 55,000 per test and a full-utilisation throughput of 180 collector and 120 tank tests per year, the facility is projected to avoid roughly INR 165 Lakh per year in third-party lab fees, against an all-in annual operating cost of approximately INR 41 Lakh — for a net annual benefit before accounting for faster-launch revenue upside.

CAPEX Estimate — Test Facility

Cost Head	Scope	Estimated Cost (INR Lakhs)	Notes
Solar Simulator System	Xenon-arc Class A rig, 4 m ² capacity	45-55	Includes lamps, optics, power supply
Outdoor Test Yard Setup	Platform, mounting bays, pyranometer array	8-10	Civil + structural work
Fluid Conditioning Loop	Chiller, heater, pumps, flow meters	12-15	-10°C to 120°C range
DAQ & Instrumentation	RTDs, pyranometers, DAQ hardware & software	10-12	NABL-traceable sensors
Thermal Storage Tank Test Bench	Insulated chamber, stratification probes	8-10	50-500 L capacity
Wind Simulation System	Variable-speed fan array	3-4	0-10 m/s
Civil & Structural	Foundation, shed, utilities connections	6-8	Client / KERONE shared scope
Commissioning, Calibration & Training	NABL pre-audit support, operator training	4-5	Includes 15-day site support
TOTAL CAPEX		INR 96-119 Lakhs	Approx. range; formal quotation on enquiry

Table 11: CAPEX estimate — indoor simulator, outdoor test yard & thermal storage tank test bench | All figures indicative

Cost-Savings & OPEX Model — Annual Basis (Full Utilisation)

Item	Basis	INR / Year (Lakhs)	Remarks
COST AVOIDANCE			
External Lab Fee Avoidance	180 collector + 120 tank tests/yr x avg. INR 55,000/test	INR 165 Lakhs	vs. external NABL lab dependency
OPERATING COSTS			
Electricity	235 kWh/test x 300 tests/yr x INR 8/kWh	INR 5.6 Lakhs	Simulator + fluid loop + DAQ
Calibration & Maintenance	Annual NABL recalibration + AMC	INR 8 Lakhs	Pyranometer, RTD, flow meter recal.
Labour (Test Engineers)	3 engineers x 12 months	INR 21 Lakhs	At INR 58,000/engineer/month CTC

Item	Basis	INR / Year (Lakhs)	Remarks
Consumables & Misc.	Xenon lamp replacement, sensors, admin	INR 6 Lakhs	Lamp life ~1,500 hrs
NET ANNUAL BENEFIT		INR ~124 Lakhs/yr	Payback ~1.8 yrs on INR 107L avg. CAPEX

Table 12: Cost-savings & OPEX model — 1.8-year payback excludes faster-launch revenue upside | Indicative figures

Project Execution & KERONE Scope of Supply

Implementation Timeline

Phase	Activity	Duration	KERONE Deliverable
Phase 0 — Pre-Order	Technical consultation, site visit, test-protocol design freeze, commercial negotiation	3-4 Weeks	Test Protocol Basis, GA drawing, utility list, commercial offer
Phase 1 — Engineering	Detailed engineering: simulator optics, fluid loop, DAQ architecture, civil layout	6-8 Weeks	Complete engineering package, vendor drawings, DFM approval
Phase 2 — Procurement	Long-lead items: xenon lamps, RTDs, pyranometers, chiller, DAQ hardware	10-12 Weeks	Material test certificates, QC inspection reports, FAT invitation
Phase 3 — Fabrication	Simulator assembly, fluid loop skid build, tank test bench fabrication	8-10 Weeks	Factory Acceptance Test (FAT) at KERONE Ambernath; client witness invited
Phase 4 — Installation	Equipment erection at client / KRDC site; piping, electrical, instrument hook-up	4-5 Weeks	KERONE site supervision; civil and electrical by client as per drawings
Phase 5 — Commissioning	Calibration, NABL pre-audit trial run, operator training	3-4 Weeks	Commissioning report, calibration certificates, O&M manual, training records
TOTAL PROJECT TIMELINE	Order to first certification-grade test report	~34-43 Weeks	From purchase order to first commercial test output

Table 13: Implementation timeline — KERONE Solar Collector & Thermal Storage Test Facility

KERONE Scope of Supply & Services

Category	KERONE Scope (Included)	Client Scope (Excluded from KERONE Supply)
Test Protocol Design	Test protocol basis, efficiency-curve model, standby-loss test plan	Product design data; test article delivery schedule
Primary Equipment	Solar simulator (complete), fluid conditioning loop, wind simulation array	Outdoor yard land preparation, if not in enquiry scope
Thermal Storage Test Bench	Insulated test chamber, stratification probe array, DAQ integration	Tank samples for test / trial runs
Controls & DAQ	DAQ hardware, SCADA/PLC, all instruments and field wiring	DG set, main power supply connection, transformer
Civil & Structural	Foundation load drawings, GA layout, anchor bolt drawings	All civil work, sheds, platforms, drains
Commissioning	FAT, site commissioning, NABL pre-audit support, operator training (15 days)	NABL accreditation application & audit fees
Documentation	GA drawings, O&M manual, calibration certificates, test-report templates	Client-side regulatory approvals, insurance

Conclusions & Why KERONE

The KERONE-designed Solar Collector & Thermal Storage Testing Facility represents a proven, commercially validated solution to one of the most consistent bottlenecks in India's solar thermal manufacturing industry — dependency on scarce, queue-constrained external test laboratories. The design is built on rigorous KRDC test data, not theoretical projections, and directly replicates the exact irradiance, flow and temperature conditions that produced measurable, standards-traceable results on SunTherm's own production collector and tank.

- **Proven Technology** — Every test parameter in the facility — irradiance range, flow-loop control, stagnation and standby-loss protocols — is directly derived from KRDC test 112/KRDC/LAB/09 on the client's actual production hardware. No extrapolation; no assumptions.
- **Quantified Outcome** — Optical efficiency of 78.9% (FPC-2020) and 74.2% (ETC-15), and a tank standby-loss coefficient of 1.42 W/K, are measurable, traceable results — not marketing claims.
- **Commercial Clarity** — The financial model demonstrates a payback period of approximately 1.8 years at conservative external-fee-avoidance assumptions, converting a recurring cost centre into an owned, scalable capability.
- **Full Ownership** — KERONE designs, fabricates, supplies, installs and commissions the complete facility from a single point of accountability — eliminating multi-vendor coordination risk across optics, fluid control, and DAQ.
- **Scalable Platform** — The same simulator and DAQ architecture scales to larger collector arrays and additional tank volumes, creating a reference facility design KERONE can replicate for other solar thermal manufacturers across India and internationally.
- **Compliance-Ready** — Calibration and traceability are integral to the KERONE supply scope, with NABL-traceable sensor calibration designed in from day one — not retrofitted ahead of an accreditation audit.

ENQUIRE ABOUT YOUR SOLAR COLLECTOR & THERMAL STORAGE TESTING PROJECT

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To initiate a project discussion, please share: collector/tank specification sheet + annual test volume + site location + target certification standard (ISO 9806 / IS 12933 / IS 15084)

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018 | CRISIL Rated Company | AIMCAL Member | IHEA Member | EMitech Certified | 50+ Years of Engineering Excellence

DISCLAIMER: All financial projections are indicative and based on prevailing market conditions as of July 2026. Test performance figures are derived from KRDC test data (Report 112/KRDC/LAB/09) conducted on SunTherm Renewable Energy Pvt. Ltd. production hardware. Actual results may vary. This document is intended for discussion purposes; a formal quotation will be issued following detailed enquiry.