



INMOTION ENERGY (OPC) PRIVATE LIMITED

Lost Circulation Material (LCM) Tester

Pressure-Differential Loss & Plugging-Strength Tester for Lost Circulation Materials — Complete with Cell Body, Interchangeable Gap Plates and Reverse-Exhaust Cylinder

Model No: IM-LCM-TER07

For API RP 13I–Style Loss & Plugging-Strength Testing

INSTRUCTION MANUAL

Updated 06 Jan 2026
Ver. 1.0

Inmotion Energy (OPC) Private Limited

186, 1st Main Road, Vijaya Bank Layout, Bilekahalli, Bangalore, Karnataka – 560076
Tel: +91 96637 44619 | info@inmotionenergy.in | inmotionenergy.in

© Copyright Inmotion Energy (OPC) Private Limited 2026

Table of Contents

Introduction	3
Description	3
Components	5
Features	7
Specifications	7
Operation	9
Calibration	10
Maintenance	11
Troubleshooting	12
Warranty and Return Policy.....	12
Ordering & Replacement Parts	14
Company & Contact Information.....	15

Introduction	Not every formation loses fluid the same way, and not every lost circulation material (LCM) plugs it the same way either. A pill that seals a tight induced fracture may do nothing against a rubble zone or a large vug, and a material rated for one differential pressure can still wash out or extrude under another. API RP 13I sets out a controlled, repeatable way to test that seal — under a known differential pressure, across a defined gap geometry — so a plugging claim can be checked on the bench before it is trusted downhole. The Inmotion Lost Circulation Material (LCM) Tester puts API RP 13I—style loss-and-plugging-strength testing within reach of field and laboratory personnel. A regulated, two-stage nitrogen supply, a 4,000 mL cell body, and a set of interchangeable gap plates reproduce fracture and vug geometries from a tight slot to a wide-open ring, while a reverse-exhaust cylinder connected at the discharge fitting checks not just whether a pill seals, but how much reverse pressure the seal can hold before it breaks down.
Description	The IM-LCM-TER07 is a pressure-differential lost circulation test cell: a single vertical pressure vessel, capped at the top and mounted on a base plate, with a nitrogen inlet valve on the body and a gap-plate discharge fitting at the base. Test fluid loaded into the 4,000 mL cell (up to (1000 ± 10) psi, delivered through a two-stage nitrogen regulator) is forced down through an interchangeable gap plate fitted at the discharge, reproducing the fracture, vug or rubble-zone geometry that the field LCM pill is meant to seal. As plugging material bridges and packs against the gap, spurt and total fluid loss are read off a graduated receiver placed beneath the discharge, giving a direct, repeatable measure of plugging efficiency. A separate reverse-exhaust cylinder — pre-charged from the same nitrogen panel and fitted with its own needle valve — connects to the discharge side once a pill has sealed the gap, applying differential pressure from the opposite direction. The pressure at which the plug breaks down is read off the panel gauges, giving the seal's actual holding strength, not just its ability to stop initial flow. Six interchangeable gap plates, sized #1 through #6 (#6 being the fully open ring, equal to the cell's bore), let one instrument stand in for formations ranging from tight induced fractures to large open vugs, and a 0–77 mm gap-plate assembly depth accommodates the resulting plug thickness. One instrument, the full loss-and-plugging picture: • Two-stage regulated nitrogen supply to (1000 ± 10) psi, sized for loss-and-plugging-strength test schedules of this type • 4,000 mL cell body for a full, uninterrupted test run • Interchangeable #1–#6 gap plates simulating fracture- to vug-scale geometry • Dedicated reverse-exhaust cylinder for plug breakdown (seal-strength) testing



The IM-LCM-TER07 cell assembly, mounted on its base plate

Components

Part Number	Description
IM-LCM-TER07-01	Pressure Cell Assembly — 4,000 mL body with domed cap, nitrogen inlet valve and gap-plate discharge fitting, mounted on the base plate
IM-LCM-TER07-02	Gap Plate Set (#1–#6) — interchangeable discharge rings, #6 fully open (bore diameter)
IM-LCM-TER07-03	Nitrogen Regulator Panel — two-stage regulation with three gauges (supply, regulated line and working pressure) and dual shut-off valves
IM-LCM-TER07-04	Reverse-Exhaust Cylinder — needle-valve pressure cylinder, connects at the discharge fitting for plug breakdown testing
IM-LCM-TER07-05	Graduated Filtrate Receiver — placed beneath the discharge fitting during test
IM-LCM-TER07-06	High-Pressure Hoses & Quick-Connect Couplings
IM-LCM-TER07-07	Base Plate & Mounting Frame
—	Nitrogen Cylinder — not included; customer-supplied. Use an industrial nitrogen cylinder fitted with an appropriate regulator, secure it upright and chained/strapped in a stand, keep it away from heat and impact, and confirm a current hydrostatic test date before use.



Gap plate set, interchangeable discharge ring sizes



Reverse-exhaust cylinder with needle valve

Features

- **API RP 13I Test Geometry** — cell dimensions, gap-plate range and pressure rating configured for loss-and-plugging-strength testing consistent with API RP 13I test principles.
- **4,000 mL Cell Body** — full test volume in a single fill, with no mid-test topping-up — fill to the marked fill line, leaving head-space above the fluid for the nitrogen charge.
- **Two-Stage Regulated Nitrogen Supply** — clean, regulated differential pressure to (1000 ± 10) psi, with supply, line and working pressure each shown on its own gauge.
- **Six Interchangeable Gap Plates (#1–#6)** — from tight induced-fracture slots up to the fully open #6 ring, covering fracture, vug and rubble-zone geometries.
- **0–77 mm Gap-Plate Assembly Depth** — accommodates the full range of plug thickness formed during a test, for a realistic plugging assessment.
- **Dedicated Reverse-Exhaust Cylinder** — connects at the discharge fitting to quantify plug/seal breakdown strength, not just initial sealing.



Nitrogen regulator panel, hoses and reverse-exhaust cylinder

Specifications

Cell Volume	4,000 mL total; fill to the marked fill line, leaving head-space for the nitrogen charge
Gas Source	Nitrogen (N ₂), two-stage regulated supply (3 gauges)
Working Pressure	Up to (1000 ± 10) psi (≈ 69 bar / 6.9 MPa)
Gap Plate Sizes	#1 – #6 (discharge ring; #6 = fully open, equal to cell bore)
Gap-Plate Assembly Depth	0 – 77 mm
Applicable Standard	API RP 13I — see note below

This instrument is designed for LCM loss-and-plugging-strength evaluation consistent with API RP 13I test principles; this is a design-intent statement, not a certification claim. Overall dimensions and weight are not listed here — contact Inmotion Energy for the current datasheet.



Lost Circulation Material (LCM) Tester, IM-LCM-TER07

Operation

1. Select the gap plate that matches the formation or loss zone being simulated (see Components, page 5) and fit it into the discharge fitting at the base of the cell.
2. Unscrew the top cap, prepare the test fluid / LCM pill per the treatment design, and pour it into the cell up to the marked fill line — do not fill to the full 4,000 mL cell volume; leave head-space above the fluid for the nitrogen charge. Reseat and tighten the cap securely before pressurizing.
3. Connect the nitrogen supply to the inlet valve on the cell body and set the two-stage regulator to the test pressure called for by the test schedule being run (up to 1000 ± 10 psi — never exceed this rated working pressure), reading supply, line and working pressure off the three panel gauges.

✓TIP

Run the gap-plate sizes in ascending order (#1 through #6) in a single session where practical — it keeps the sealing trend easy to read across the full simulated geometry range.

4. Place the graduated receiver beneath the discharge fitting, then open the inlet valve to begin the timed test. Record fluid volume against elapsed time as the pill bridges and packs against the gap plate.
5. Note the spurt-loss volume (before the plug seals) and the time and volume at which flow effectively stops.

⚠IMPORTANT

Lost circulation materials and treatment fluids can be caustic or abrasive on contact. Gloves and eye protection should be worn any time samples are handled. Before opening the cell: shut off the nitrogen supply at the source, close the inlet valve, and vent the cell and hoses fully to atmospheric pressure. Confirm that all three panel gauges read zero before unscrewing the cap. Never unscrew the cap while any gauge shows residual pressure.

6. Once sealed, close the cell's inlet valve and vent the cell to atmospheric pressure. Remove the graduated receiver from beneath the discharge fitting before starting the reverse test — breakdown can expel fluid under pressure. Connect the reverse-exhaust cylinder to the discharge fitting, charge it from the same nitrogen panel, and open its needle valve in controlled steps to apply pressure against the underside of the plug, reading the applied pressure off the panel gauges. Never exceed the rated working pressure of (1000 ± 10) psi. Record the pressure at which the plug breaks down, and stand clear of the discharge path throughout in case of sudden release.
7. Record total fluid loss volume, time to plug, and reverse-exhaust breakdown pressure for the test report.
8. Depressurize the system fully, disconnect the reverse-exhaust cylinder, and clean the gap plate, cell bore and discharge fitting immediately after testing.

Reporting Results

Report spurt loss, total loss volume, time to plug and reverse-exhaust breakdown pressure against the gap plate size used, so different LCM pills can be compared on a like-for-like basis.

Calibration

Basic Calibration

The pressure gauges and regulator leave the factory checked and matched to the cell's rated working pressure. The reference-gauge check below confirms the working gauge hasn't drifted out of tolerance and is good practice before any critical test run.

1. Isolate the cell (close its inlet valve) and depressurize it fully so no calibration pressure reaches the cell itself. Working only on the nitrogen panel and regulator, connect a certified reference pressure gauge in line with each of the instrument's three panel gauges in turn.
2. Apply pressure in steps across the working range (up to 1000 ± 10 psi) and compare each instrument gauge reading to the reference gauge at each step.
3. A reading within the tolerance band printed on each gauge face confirms that gauge is within factory tolerance.

Out-of-Calibration Units

If a reading falls outside tolerance, check that fittings are tight and the reference gauge is itself in current calibration, then repeat the check. If the discrepancy persists, the affected gauge should be returned to Inmotion Energy for recalibration or replacement.

When to Recalibrate

- Before any test run where the result will be used for a critical LCM selection decision
- After a pressure spike, impact, or any other physical shock to the gauge or regulator
- If test results begin looking inconsistent between otherwise identical pills
- On whatever routine schedule your facility's QA/QC program calls for

⚠️IMPORTANT

Never exceed the rated working pressure of (1000 ± 10) psi. Never attempt to service or disassemble the pressure gauges or regulator in the field — return them to Inmotion Energy or an authorized service provider.

Maintenance	1. Clean the cell bore, gap plate and discharge fitting immediately after each test — dried LCM residue left in the gap will bind the gap plate and skew every subsequent reading. 2. Inspect the gap plate and cell seals for wear, scoring or damage before each test series; a worn gap plate or seal will not hold pressure true and will bias the reading. 3. Keep the nitrogen regulator, gauges, hoses and reverse-exhaust cylinder free of dust and grit; do not lubricate the pressure seals. 4. Store the instrument with the cell open and dried, gas supply disconnected, in a dry cabinet away from vibration and direct heat. 5. Re-run the reference-gauge check (page 10) any time the instrument has been dropped, jarred, or readings begin to drift. NOTE <i>Never use a wire brush, metal pick, or sharp tool to clean the gap plate or cell bore — use a soft cloth only. Scoring the gap plate or cell surface, even slightly, will throw off every plugging reading afterward.</i>
---------------------------	--

Troubleshooting

Symptom	Possible Cause	Recommended Action
No pressure buildup	Nitrogen supply low/off, or regulator fault	Confirm N2 supply and regulator setting; check all fittings for leaks
Cell won't hold pressure	Gap plate or cell seal not seated, or seal worn	Reseat or replace seal; inspect gap plate for damage
Inconsistent loss volume between runs	Cell not filled to a consistent level, or gap plate worn	Standardize fill volume; inspect gap plate for wear
Reverse-exhaust cylinder won't hold pressure	Needle valve seal worn or debris in valve seat	Clean valve seat; if still leaking, contact Inmotion Energy for valve service
Gauge reading disagrees with reference check	Gauge drifted or damaged	Recalibrate or replace gauge; see Calibration, page 10

Still stuck after trying the above? Set the instrument aside and get in touch with Inmotion Energy (see Company & Contact Information, page 15).

Warranty and Return Policy**Warranty**

Inmotion Energy (OPC) Private Limited stands behind the materials and workmanship of every instrument it ships. For eighteen (18) months from the invoice date, if a product turns out not to meet its stated specifications through no fault of the buyer, and we're notified in writing once the issue is found, we'll repair or replace it at our discretion, subject to the exclusions below.

This coverage assumes normal use, in line with the operating conditions described in this manual. It does not stretch to cover use outside those conditions, nor to flaws that were plainly visible on arrival but went unreported.

Beyond what's stated here, Inmotion Energy doesn't offer any other express or implied warranty — including, to the extent the law allows, implied warranties of merchantability or fitness for a particular purpose.

Coverage does not extend to damage or loss caused by:

- Installation, operation, or upkeep that doesn't follow this manual
- Misuse, carelessness, or accidental damage
- Adjustment, disassembly or repair of the pressure cell or gauges carried out by anyone other than Inmotion Energy or an authorized service provider
- Storage conditions or exposure beyond what normal field use implies
- Parts or components sourced from outside Inmotion Energy
- Ordinary wear items — gap plates and cell seals, for example

Returns and Repairs

Pack anything you're sending back carefully — Inmotion Energy can't take responsibility for damage caused by inadequate packaging in transit.

If you're returning a unit that isn't defective, do so within thirty (30) days of your invoice; a restocking charge may apply, and the item needs to arrive in its original condition to qualify for a refund.

Before shipping anything back, reach out to us with your invoice number, a description of the issue, and your contact details so we can set expectations. Send equipment to:

Inmotion Energy (OPC) Private Limited

Attn: Service & Repair

186, 1st Main Road, Vijaya Bank Layout, Bilekahalli, Bangalore, Karnataka – 560076

Questions before then? Reach our support team at info@inmotionenergy.in.

**Ordering &
Replacement
Parts**

Send the Inmotion Energy sales team a note about what you're working on, and we'll help identify the right spares. Replacement gap plates, seals, gauges and cylinders are kept in stock and shipped on request.

Have this ready when you reach out:

- Model / catalog number (IM-LCM-TER07)
- The part number and description you need (see Components, page 5)
- How many you need
- Your company name, shipping address, and a contact point



Gap plate spares kept in stock

Company & Contact Information	Inmotion Energy (OPC) Private Limited has for years supplied precision instruments and drilling tools for testing drilling fluids, well cements, and completion fluids. From our Bangalore facility, we provide customers across India and the Middle East with quality products and exceptional service. As an independent manufacturer, we have one priority: our customers. Industries We Serve ● Onshore & offshore drilling contractors ● National & independent oil companies ● Mud engineering & testing laboratories ● Well completion & workover operations Why Choose Us ● Quality-checked before shipment ● Fast turnaround on spares & replacements ● Field-tested designs, built for uptime Contact Details Inmotion Energy (OPC) Private Limited 186, 1st Main Road, Vijaya Bank Layout, Bilekahalli, Bangalore, Karnataka – 560076 Phone: +91 96637 44619 Email: info@inmotionenergy.in Website: inmotionenergy.in
--	--