

SERAPHIN® SLICKER PLATE LAB MEASURE

OPERATING AND MAINTENANCE INSTRUCTIONS

Seraphin® Test Measure
A Division of Pemberton Fabricators, Inc.
Rancocas, NJ



Series C & H

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CARE, MAINTENANCE, AND USE OF A SERAPHIN[®] PROVER

- A SERAPHIN[®] prover is designed and constructed according to NIST handbook 105-3 and API Manual of Petroleum Measurement Standards (MPMS) Chapter 4.
- Prover calibration may be established at 1-year intervals and extended or reduced on historical evidence up to the limit determined by your regulatory agency, but should not exceed 3 years due to possible leaking valves or seals which are often difficult to observe under field conditions.
- The prover should be maintained in a clean, dent free condition for accurate readings.

Description:

A Slicker Plate Laboratory Measure is typically used in a metrology laboratory environment to measure the accuracy and to set the zero mark on test measures and provers.

Prover Wetting Procedure:

I. Cleanliness Verification

1. Fill and drain both standard and vessel to be calibrated and check for any soiling that would affect drainage, as evidenced by clinging droplets, greasy films, and the like. Clean either or both with detergent and water, as necessary, and rinse thoroughly.
2. Fill vessel with water to its nominal level and dump contents during a 30 ± 5 second period then drain for a 10-second period after cessation of flow. Touch off any adhering drop from the neck. This constitutes the "wet-down" condition.

NOTE: *The prover must be filled once and drained in order to wet the internal sides of the prover body. Wetting the internals of the prover helps ensure consistency in the amount of liquid that clings to the sides, from one test to the next.*

3. Fill slicker-plate standard with water, raised by surface tension slightly higher than the rim. Use slicker-plate to strike off a precise volume, checking to see that no air bubbles are entrained during the leveling process.
4. Open valve at base and transfer water from the standard to the wet-down vessel. Allow a 30-sec drain period after cessation of flow.

II. Testing Procedure:

- 1 Level vessel (or suspend it by its handle, if appropriate) and read scale on its neck. Record reading.




Stop Static.

WARNING: *The prover system must be properly grounded prior to conducting petroleum measurement testing to prevent possible static electricity from sparking which could ignite a flammable product. Follow all safety measures.*

- 2 If a flammable liquid is being tested, ensure the prover is grounded to a proper earth ground using a grounding cable and clamp (to eliminate static electricity build-up).
- 3 Make a duplicate determination which should agree with the former within ± 0.2 in³. If excess disagreement, check all vessels for cleanliness and repeat duplicate determinations until satisfactory agreement is obtained.
- 4 Adjust the scale of the vessel. Seal the scale adjustment device.



CAUTION: *Disposal of drained fluid should be done in an environmentally safe and responsible manner in accordance with good industry practices and in compliance with OSHA regulations*

III. Care and Maintenance

1. Check lab measure periodically for leaks at the valve, and seams. If a leak is detected, call your SERAPHIN® for authorized repair parts.

Note: *Refer to NIST Handbook 145 SOP 18, and Chapter 12.2 Calculations of Petroleum Quantities for detailed information and procedures.*

Terminology

Bottom loading: Method of filling a volumetric vessel. Intake is made with a bottom load adapter.

Capacity, nominal: The nominal capacity of a field standard test measure or prover is the volume used to designate the measure or prover. The volume is determined by the nominal mark on a graduated upper neck gauge and between the nominal mark on the graduated upper neck gauge and the lower shut off valve or zero mark on a lower neck gauge on a prover.

***NOTE:** The nominal capacity of the prover has be set at the Seraphin® facility using Standards that are traceable to the National Institute of Standards and Technology (NIST). If uncertainty values or a higher order of calibration is needed the unit should be sent to a certified calibration laboratory.*

Cubical coefficient of thermal expansion: Three dimensional expansion or contraction of a material due to temperature change, expressed °C⁻¹ or °F⁻¹

Field standard test measure: A measure that can be hand held and is usually less than 40 Liters (10 Gallons).

"High Resolution" standard: A standard with a small diameter neck for improved resolution in reading the meniscus. Generally used in the laboratory as a standard or check standard for measurement control of a primary standard.

Main flow cessation: The moment when a full discharge stream "breaks" and becomes a trickle or a drip.

Prover: Bottom drain is implied. Filled from the top or bottom loading, depending on intended use. May be free standing, mounted permanently, or on truck or trailer and not hand held.

Reference temperature: The temperature at which the measure is intended to contain or to deliver its nominal capacity.

Sight-flow-indicator: A fitting with windows to visually observe the flow through a pipe.

Submerged fill pipe: Pipe used in top filling to minimize foaming of liquids, such as fuel oil and milk, by discharging the product into the bottom of a prover.

To contain: An indication that the standard is adjusted to contain its intended volume when filled from its empty condition at a reference temperature. (the empty condition is "dry" and test measures or provers are generally not used in this condition).

To deliver: An indication that the standard is adjusted to deliver its intended volume at a reference temperature. Provers used in a "wet" condition are marked To Deliver.

Tolerance: Maximum permissible error. A value fixing the limit of allowable error or departure from the true performance or value.

Vapor recovery: A system for entrapping and collecting vapors for return to the tank to prevent expulsion into the atmosphere.

SAFETY

The use of a test measure or prover standard may involve hazardous materials, operations, and equipment. Seraphin does not purport to address all safety problems associated with the use of each product. It is the responsibility of the user of the standard to establish appropriate safety and health practices and determine the applicability of local and federal regulatory limitations prior to use. Specific safety information is documented in the various trade references (e.g. American Petroleum Institute and Petroleum Equipment Institute).

Commercial liquid measuring devices, tested with provers, are typically used to measure quantities of petroleum products. Petroleum products are known hazardous materials and hazardous wastes. The user is encouraged to obtain Material Safety Data Sheets (MSDS) from the manufacturer of any product encountered. Federal, state and local safety and disposal regulations concerning hazardous materials encountered should be reviewed by the user.

Safety devices and locks should be installed to prevent inadvertent operation of, or unauthorized tampering with, equipment. All automated or power-operated meter proving systems should have emergency manual operators for use during an accident or power failure. Grounding devices should be provided to protect against electrical shock or static discharge in both tank prover and \ electrical instrumentation.

All electrical connections must be explosion proof. All wiring, including low voltage wiring shall meet the requirements of Article 300, 500, Group D, Class 1, Division 1, and 250.45 and/or other applicable articles of the latest edition of the National Electrical Code.

SERAPHIN® TEST MEASURES
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