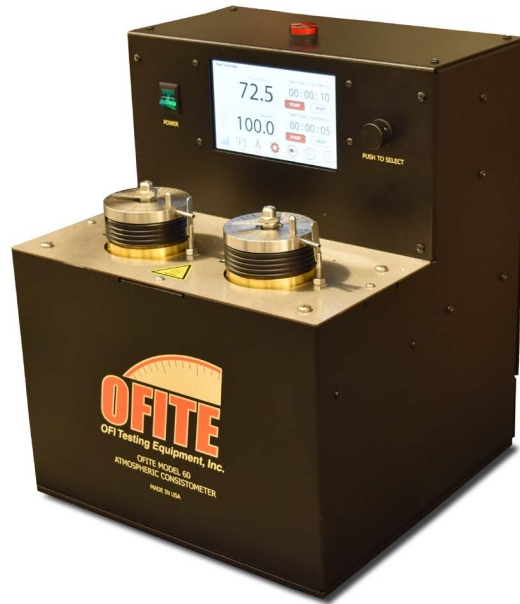




Dependable Products From People You Trust



Atmospheric Consistometer

#120-75 (115V)
#120-75-1 (220V)

Instruction Manual

Updated 12/1/2022
Ver. 7

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Intro

The Model 60 Atmospheric Consistometer is designed to condition cement slurries as specified within API Specification 10. Determination of rheological properties, examination of free water content, and evaluation of the API fluid loss test all require that the cement slurry be conditioned by an atmospheric consistometer. The OFITE Model 60 was specifically developed to perform these duties.

Description

A cement slurry is prepared according to the procedure outlined in the API Specification 10 and then placed in the slurry containers of the Model 60 Atmospheric Consistometer. The slurry is stirred at 150 RPM by an API-designed paddle assembly. The temperature is controlled by a microprocessor, which displays the process temperature via a digital indicator. Consistency, measured in Bearden Units of Consistency, is determined by measuring the deflection of a calibrated spring. This deflection is created by the amount of torque that the cement slurry exerts on the paddle, which is a function of the consistency of the cement. The API defines 100 Bc as 2,080 g-cm of torque.

Features

- Maximum operating temperature of 200°F
- Unit is operated at atmospheric pressure
- Temperature is maintained via a touch-screen display
- Process temperature is displayed digitally
- Heat transfer fluid is continuously circulated
- Heater wattage is 1,500
- Slurry container rotational speed is 150 RPM
- Dual container design
- Cooling system included
- Stainless steel temperature bath
- Deadweight calibration unit
- Size: 14.5" × 15.5" × 24.5" (37 × 39 × 62 cm)
- Weight: 95 lb (43.1 kg)
- Crated Size: 32" × 21" × 32" (81 × 53 × 81 cm)
- Crated Weight: 200 lb (90.7 kg)

Requirements

- Water Supply for Cooling
- Water Drain
- 220 Volt, 50/60 Hz, 2.2 KVA Power Source
- 120 Volt, 50/60 Hz, 4.4 KVA Power Source

Components

#120-001	Mineral Oil, 1 Gallon, Qty: 3
#120-75-8	Motor Timing Pulley
#120-75-9	Weight Hanger
#120-75-10	Slotted Weight Set
#120-75-16	Calibration Stand
#120-75-17X-MOD	Drive Housing
#120-75-18	Potentiometer Assembly
#120-75-19	Paddle Assembly
#120-80-6	Motor
#120-511	Slurry Cup Shear Pin
#121-001	Container O-rings
#121-002	Retaining Ring
#121-007-3	Main Bearing
#121-008	Thermocouple
#121-009	Timing Belt
#121-013	Slurry Container
#121-014	Container Bottom
#172-24	Solid State Relay
#174-14	Motor Controller

For 115 VAC Only:

#120-75-2	Water Solenoid Valve
#121-010	Heater
#122-074-1	Fuse, 5 Amp, 5 mm × 20 mm
#122-078	Fuse, 15 Amp, 5 mm × 20 mm
#152-37	AC Power Cord

For 230 VAC Only:

#120-75-3	Water Solenoid Valve
#121-010-1	Heater
#122-073-1	Fuse, 3 Amp, 5 mm × 20 mm
#122-075	Fuse, 7 Amp, 5 mm × 20 mm
#152-38	AC Power Cord

Optional:

#120-76 Spare Parts for #120-75:

- #120-75-19 Paddle Assembly, Qty: 2
- #120-511 Slurry Cup Shear Pin, Qty: 10
- #120-602 Calibration Spring; Qty: 2
- #121-001 Container O-rings; Qty: 8
- #121-002 Retaining Ring; Qty: 2
- #121-005 Cap Nut
- #121-007-3 Main Bearing; Qty: 2
- #121-008 Thermocouple
- #121-009 Timing Belt; Qty: 2
- #121-010 Heater
- #121-013 Slurry Container
- #121-014 Container Bottom; Qty: 2
- #122-074-1 Fuse, 5 Amp, 5 mm × 20 mm; Qty 4
- #122-078 Fuse, 15 Amp, 5 mm × 20 mm; Qty: 2

#120-76-1 Spare Parts for #120-75-1:

- #120-75-19 Paddle Assembly, Qty: 2
- #120-511 Slurry Cup Shear Pin, Qty: 10
- #120-602 Calibration Spring; Qty: 2
- #121-001 Container O-rings; Qty: 8
- #121-002 Retaining Ring; Qty: 2
- #121-005 Cap Nut
- #121-007-3 Main Bearing; Qty: 2
- #121-008 Thermocouple
- #121-009 Timing Belt; Qty: 2
- #121-010-1 Heater
- #121-013 Slurry Container
- #121-014 Container Bottom; Qty: 2
- #122-073-1 Fuse, 3 Amp, 5 mm × 20 mm; Qty: 4
- #122-075 Fuse, 7 Amp, 5 mm × 20 mm; Qty: 2

Setup



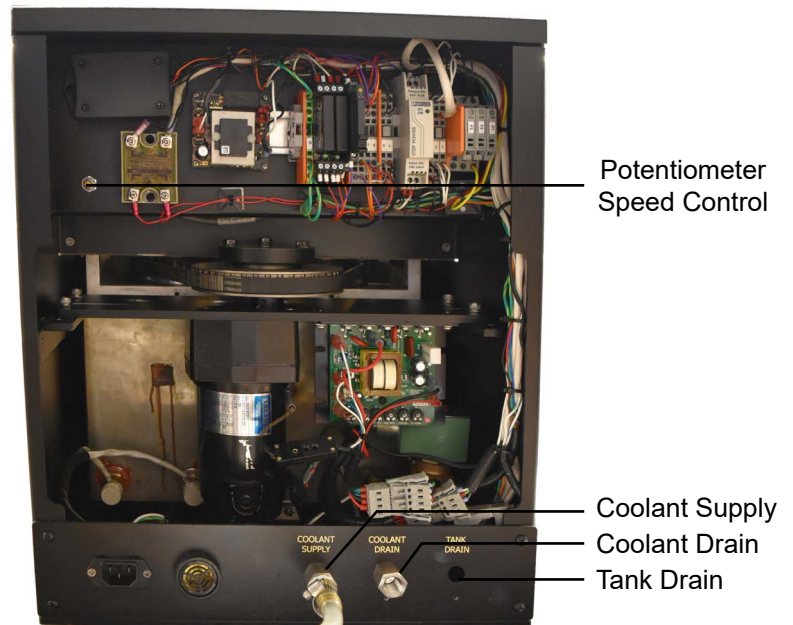
1. Carefully remove the unit from the crate and place it close to a water supply and drain.

Water supply and drain lines are ¼" tube connections and the water supply port should be connected to a 40 PSI (275.8 kPa) water source. The water drain is the port located on the right of the lower back instrument panel.

2. Fill the bath with enough mineral oil to submerge the test cells at least half way.

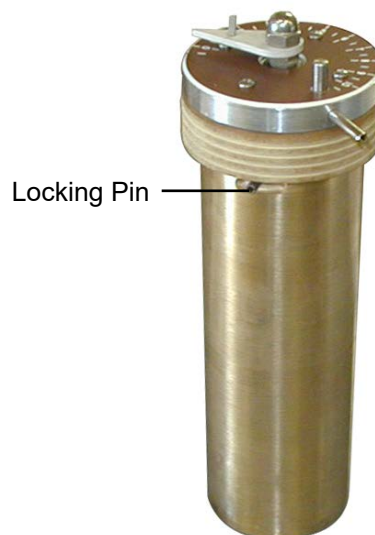
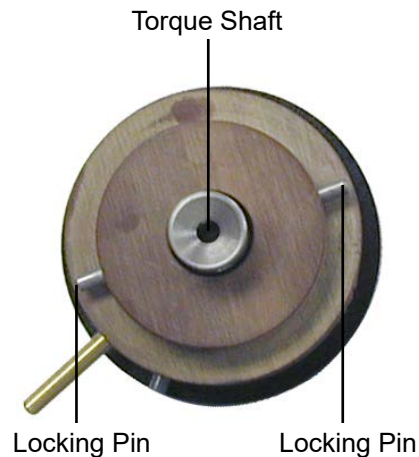
Do not overfill the bath.

3. Connect the unit to a grounded and fused 10-amp electrical supply.
4. The rotational speed of the unit may need to be adjusted periodically.
 - a. Turn on the electrical power and start the motor.
 - b. Measure the rotational speed of the rotators with a hand held tachometer. The rotational speed should be $150 \text{ RPM} \pm 15$.
 - c. If adjustment is required, loosen the three screws on the back panel of the unit and open the door. Directly to the right of the motor is the motor speed potentiometer.
 - d. To increase the rotational speed, turn the potentiometer speed control clockwise. Turn it counterclockwise to reduce the speed.



Loading the Test Cells

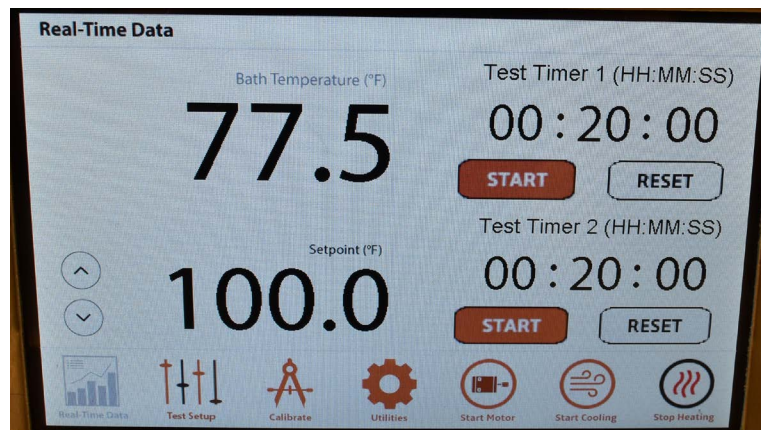
1. Prepare the cement slurry as specified in API Specification 10.
2. Cover the paddle surface with a light coating of grease. This will facilitate cleaning after the test is complete.
3. Pour the cement slurry into the test cell.
4. Insert the paddle into the test cell. Make sure the point on the end of the paddle is inserted into the hole in the bottom of the test cell.
5. Place the lid on the test cell by sliding the torque shaft over the end of the paddle. Turn the lid clockwise until the pin in the torque shaft engages with the slot in the paddle shaft.
6. Continue turning the lid to lock it in place on top of the test cell.
7. Lower the test cell into the bath and lock it in place with the locking pins.



Operation

The OFITE Atmospheric Consistometer performs two functions. It can be used to condition a cement slurry or to perform a thickening time test as detailed in API Specification 10.

1. Turn the “Power” switch on.
2. On the touch screen, touch the temperature setpoint and enter the test temperature or use the up and down arrows to set the test temperature.



3. Touch the “Start Heating” button to start the heater.
4. Load one or both test cells. Refer to “Setup - Loading the Test Cells” on page 6 for details.



Important

It is very important that you begin the test within one minute of mixing the cement slurry.

5. Touch the “Start Motor” button to start the motor.
6. On the “Test Timer 1” or “Test Timer 2” touch the hours, minutes, or seconds and enter the appropriate value to set the timer.
7. Touch the “Start” button to start the timer.
8. When the test or conditioning is complete, touch the “Stop Motor”, “Stop Heating”, and “Start Cooling” buttons.
9. When the test cells are cool enough to touch, remove them from the unit and thoroughly clean them with soap and water. Be sure to remove any residual cement.

Calibration

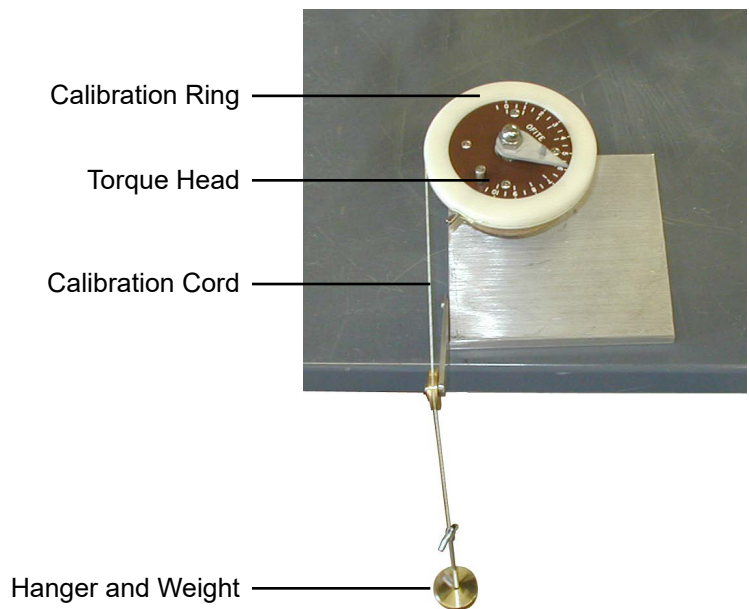
Torque Head

Calibrating the torque head provides a reference point for interpreting test results. The calibration kit provided uses dead weight to simulate resistance on the torque head. To calibrate, four different weights are applied and the corresponding torque head readings are recorded. During operation, compare the torque head reading to those recorded during calibration to determine the amount of resistance being put on the torque head.

Before calibrating the torque head, test the container paddle for excessive friction by running the sample container without any cement slurry in it. If the paddle is bent and rubbing on the side of the sample container or if the bearings are damaged, excessive friction will show on the dial (refer to the maintenance section on page 11 for more information). Correct any defects before calibrating the torque head.

Calibration instructions are described in API-RP-10-B. Your instrument is equipped with an instrument-mounted calibration unit.

1. Place the torque head onto the calibration stand.
2. Place the calibration ring around the torque head.
3. Wrap the deadweight calibration cord counterclockwise around the calibration ring and over the roller.
4. Place 400 g on the weight hanger and attach it to the calibration cord.



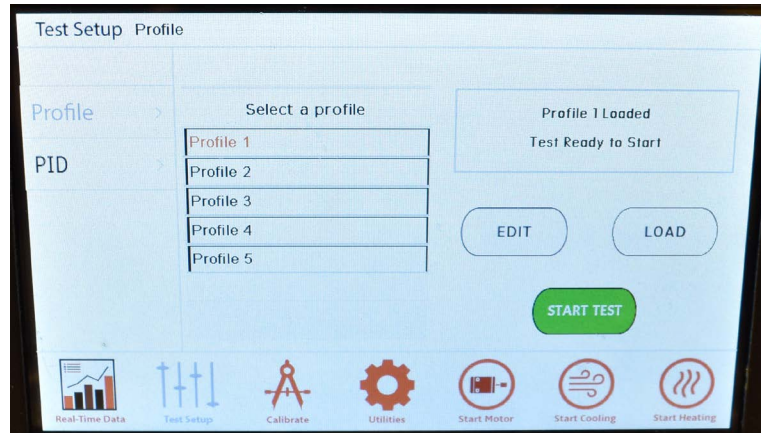
When adding weights, remember that the hook weighs 50 grams. Therefore, to test the potentiometer at 200 g, you only need to add 150 g to the hook.

5. Pull the weight down several times to obtain an average reading.
6. Repeat this process with 100 g, 200 g, and 300 g. Record each weight and the corresponding reading. These values will help you interpret the potentiometer readings.

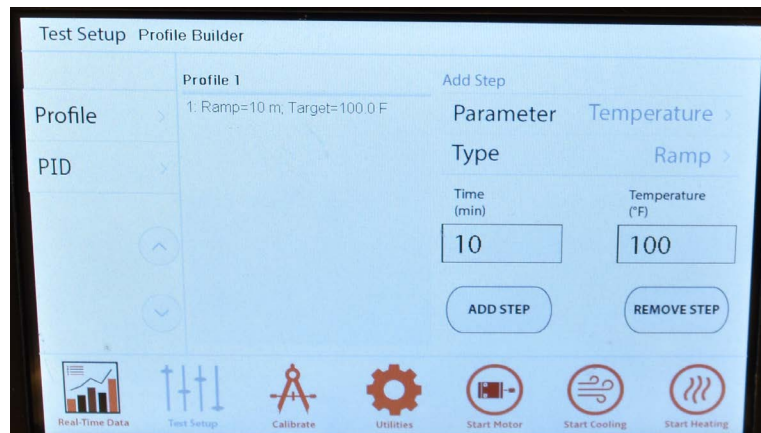
Test Setup

The Atmospheric Consistometer can be programmed with different temperature profiles.

1. Touch the “Test Setup” button.
2. Choose a profile and touch the “Edit” button.



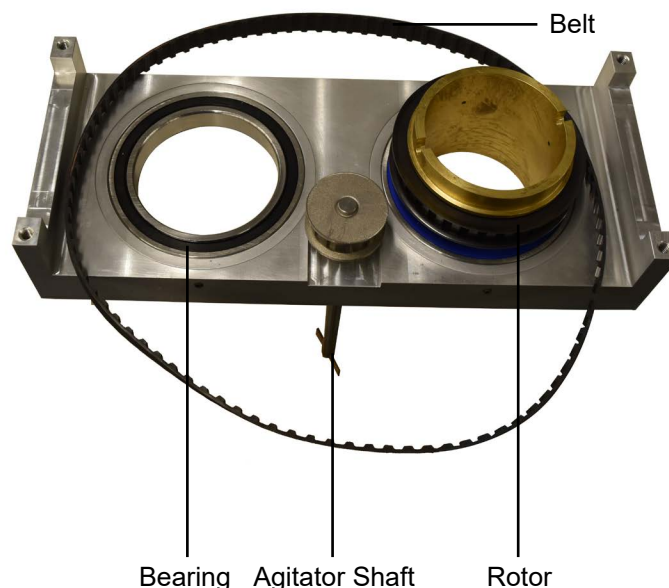
3. Touch “Type” to choose between Ramp and Dwell:
 - **Ramp:** Change the temperature of the bath over a specified period of time.
 - **Dwell:** Hold the current temperature for a specified period of time.



4. Touch “Profile” to go back.
5. Touch “Load” to load the test profile into memory.
6. Touch “Start Test” to run the temperature profile. The display will return to the “Real-Time Data” screen.
7. To stop the test, touch “Test Setup” and then “Stop Test”.

Maintenance

1. The belt and bearings that drive the rotators should be inspected periodically. To disassemble the unit to access the bearings and belt:
 - a. Disconnect the unit from all electrical power.
 - b. Remove the back protective cover plate.
 - c. Loosen the screws on the motor mount and push the motor forward.
 - d. Release the belt from the motor timing sprocket.
 - e. Remove the upper cover plate and set it on blocks or on a bucket to prevent damage to the agitator shaft.
 - f. Loosen the four screws allowing the top plate to be removed from the bearing housing.
 - g. Pull out the rotator and examine the thrust bearings for damage and wear. Periodically clean the bearings by lightly spraying them with WD-40. If they do not turn freely and smoothly, replace them with new bearings.
 - h. Inspect the belt for damage or wear. If necessary, replace it with a new belt.
 - i. Re-assemble the unit, pushing the belt through the bath slot.
 - j. Pull the motor back only enough to prevent belt slippage. Allow approximately $\frac{3}{4}$ " to 1" slack in the timing belt to prevent excessive side thrust to the bearings.



2. The bath should be checked and cleaned annually.
 - a. Access the bath housing as described in steps a through f on the previous page.
 - b. Visually inspect the mineral oil in the bath. If it contains any foreign material, pour out the entire contents and refill with clean mineral oil.
3. Containers and paddles should be kept as clean as possible. A light coating of grease on these components will facilitate cement removal.
4. The unit has four fuses, located on the front panel beneath the four power switches. If any of the switches stop working, check the corresponding fuse. To remove a fuse, twist and pull the knob. After replacing the fuse, reinsert it into the slot and twist it to secure it in place.

Warranty and Return Policy

Warranty:

OFI Testing Equipment, Inc. (OFITE) warrants that the products shall be free from liens and defects in title, and shall conform in all respects to the terms of the sales order and the specifications applicable to the products. All products shall be furnished subject to OFITE's standard manufacturing variations and practices. Unless the warranty period is otherwise extended in writing, the following warranty shall apply: if, at any time prior to twelve (12) months from the date of invoice, the products, or any part thereof, do not conform to these warranties or to the specifications applicable thereto, and OFITE is so notified in writing upon discovery, OFITE shall promptly repair or replace the defective products. Notwithstanding the foregoing, OFITE's warranty obligations shall not extend to any use by the buyer of the products in conditions more severe than OFITE's recommendations, nor to any defects which were visually observable by the buyer but which are not promptly brought to OFITE's attention.

In the event that the buyer has purchased installation and commissioning services on applicable products, the above warranty shall extend for an additional period of twelve (12) months from the date of the original warranty expiration for such products.

In the event that OFITE is requested to provide customized research and development for the buyer, OFITE shall use its best efforts but makes no guarantees to the buyer that any products will be provided.

OFITE makes no other warranties or guarantees to the buyer, either express or implied, and the warranties provided in this clause shall be exclusive of any other warranties including ANY IMPLIED OR STATUTORY WARRANTIES OF FITNESS FOR PURPOSE, MERCHANTABILITY, AND OTHER STATUTORY REMEDIES WHICH ARE WAIVED.

This limited warranty does not cover any losses or damages that occur as a result of:

- Improper installation or maintenance of the products
- Misuse
- Neglect
- Adjustment by non-authorized sources
- Improper environment
- Excessive or inadequate heating or air conditioning or electrical power failures, surges, or other irregularities
- Equipment, products, or material not manufactured by OFITE
- Firmware or hardware that have been modified or altered by a third party
- Consumable parts (bearings, accessories, etc.)

Returns and Repairs:

Items being returned must be carefully packaged to prevent damage in shipment and insured against possible damage or loss. OFITE will not be responsible for equipment damaged due to insufficient packaging.

Any non-defective items returned to OFITE within ninety (90) days of invoice are subject to a 15% restocking fee. Items returned must be received by OFITE in original condition for it to be accepted. Reagents and special order items will not be accepted for return or refund.

OFITE employs experienced personnel to service and repair equipment manufactured by us, as well as other companies. To help expedite the repair process, please include a repair form with all equipment sent to OFITE for repair. Be sure to include your name, company name, phone number, email address, detailed description of work to be done, purchase order number, and a shipping address for returning the equipment. All repairs performed as "repair as needed" are subject to the ninety (90) day limited warranty. All "Certified Repairs" are subject to the twelve (12) month limited warranty.

Returns and potential warranty repairs require a Return Material Authorization (RMA) number. An RMA form is available from your sales or service representative.

Please ship all equipment (with the RMA number for returns or warranty repairs) to the following address:

OFI Testing Equipment, Inc.
Attn: Repair Department
11302 Steeplecrest Dr.
Houston, TX 77065
USA

OFITE also offers competitive service contracts for repairing and/or maintaining your lab equipment, including equipment from other manufacturers. For more information about our technical support and repair services, please contact techservice@ofite.com.