



# **USER'S GUIDE**

**FOR**

**THE FOAMER**

**PAVEMENT TECHNOLOGY, INC.**

**9308-A Industrial Drive NE**

**COVINGTON, GEORGIA 30014**

**TEL: 770-388-0909**

**FAX: 770-388-0149**

**[www.pavementtechnology.com](http://www.pavementtechnology.com)**

## TABLE OF CONTENTS

### Page

INTRODUCTION

SAFETY INSTRUCTIONS

MACHINE SPECIFICATIONS

PART 1 GETTING STARTED

1.1 Checking The Parts.....1-1

1.2 Location and Power Source.....1-1

1.3 Names of Parts.....1-2

1.4 Installation.....1-3

PART 2 OPERATING THE FOAMER

2.1 Operating Procedure..... 2-1

PART 3 MAINTENANCE AND TROUBLE SHOOTING

3.1 Maintenance.....3-1

3.2 Trouble Shooting.....3-1

## PART 4 CALIBRATION

4.1 LOAD CELL CALIBRATION.....	4.1
4.2 WATER PERCENTAGE.....	4.2

## INTRODUCTION

**“THE FOAMER”** is designed and manufactured to provide repeatable foamed asphalt samples that are used for Warm Mix Asphalt Mix Designs in the Laboratory. **“THE FOAMER”** is rugged and can easily be used in tandem with a laboratory mixer. Below are some features of **“THE FOAMER”**.

- Fully Automated PLC Control System (Digital Graphic Interface) assures correct timing and control of the foamed asphalt and features touch screen controls for all operations.
- Proportions, flow-rates, timing, pressures and volume of both Asphalt Cement (AC) and Water can all be validated and are adjustable.
- Up to 14 pounds of AC can be accumulated by this system.
- Reservoir is lined with special high-temperature, disposable polymer bag which can be discarded upon completion of test.
- The System accepts standard 1 quart and 1 gallon cans of asphalt cement at room temperature; handling of hot asphalt and containers is not necessary.

- The System incorporates a “Quick-Change” feature that allows batches to be sequentially run with literally no clean-up.
- System allows for easy clean-up and minimum residual asphalt.
- Unit is mobile and has adjustable dispensing height.

## SAFETY INSTRUCTIONS

- **“THE FOAMER”** has many heated surfaces. Use caution when touching any outside surface areas. The inside reservoir and exit tube should never be touched when the unit is heated.
- Allow all components to cool before replacing disposable high-temperature polymer bag.
- The foamed asphalt leaving the exit tube is still extremely hot. Use caution when lowering the drip catcher.
- Allow 36” of access on all sides of **“THE FOAMER”** when placing in final location.
- **Before turning HMI Touch Panel on, make sure bag thermocouple has been plugged into female receptacle on inside of chamber.**
- **“THE FOAMER”** has more than one power source. Always turn main breaker off before disconnecting plug from receptacle.

- Never attempt to clean, oil or adjust the machine while in operation.

## MACHINE SPECIFICATIONS

### DIMENSIONS:

Width:	35"
Length:	36"
Height:	72"
Weight:	300lbs.

### REQUIREMENTS:

Electrical	120 VAC, 20-Amp
------------	-----------------

Compressed Air	110 PSIG :
----------------	------------

Water	Standard Tap Water
-------	--------------------

### CAPACITY:

Asphalt Cement	1.64 US gallons liquid
----------------	------------------------

TEMPERATURE:	Maximum System Temperature 400F (194C)
--------------	--

## COMPONENTS:

### Frame:

Extruded Aluminum Framing

### Chamber:

Heated and Pressurized Aluminum Chamber with reservoir which

accepts standard 1 quart and 1 gallon containers of ambient asphalt cement.

High Temperature Polymer Bag and Tube are located inside the reservoir.

### Controls:

Fully Automated PLC Control System (Digital Graphic Interface) assures correct timing and control of the foamed asphalt and features touch screen controls for all operations. Control System has an attached printer which is used to print test parameters.

### Adapters:

Utilized to accept standard 1 quart and 1 gallon containers of ambient asphalt.

### Pneumatic Cylinder:

Utilized to Raise and Lower Chamber for various laboratory mixer heights.

## PART 1 GETTING STARTED

### 1.1 Checking the Parts

The following parts are included with “**THE FOAMER**”

- One Gallon Adapter
- One Quart Adapter
- Ten Disposable High-Temperature Polymer Bags with flow tubes and thermocouples installed.
- **LOAD CELLS. THE LOAD CELLS ON THIS MACHINE ARE EXTREMELY SENSITIVE. DO NOT BUMP, DROP OR PLACE ANY HEAVY OBJECTS INTO RESERVOIR. USE CAUTION WHEN INSTALLING POLYMER BAGS AND AMBIENT ASPHALT CONTAINERS. RAISING AND LOWERING THE CHAMBER WHILE FULL OF ASPHALT MAY DAMAGE LOAD CELLS. SET THE DESIRED HEIGHT BEFORE INTRODUCTION OF LIQUID AC OR AMBIENT TEMPERATURE AC IN GALLON CAN. WHEN MOVING THE FOAMER, LIFT THE RESERVOIR COMPLETELY OFF THE LOAD CELLS AND REST THE RESERVOIR ON THE INSIDE OF THE CHAMBER.**

### 1.2 Location and Power Source

Location: The overall dimensions of the machine are 35 in. wide by 36 in. long by 72 in. high. The machine should be located on a level floor, using shims to adjust and level the machine. The machine is operated from the front. A space of 3 ft. should be allowed for access on all sides for normal operation.

Electrical Requirements: A single phase 110 Volt 20 Amp fused electrical outlet is required. It is recommended that a separate circuit

serving only this machine be provided and be equipped with a 20 ampere circuit breaker **(Dedicated 20-Amp Circuit is Required)**. A ten foot power cord is provided with a 20 ampere plug on the end.

1-1

### 1.3 Names of Parts



Lower Chamber Assembly

includes: Load Cells; Reaction Chamber; Water Nozzle; Pinch Valve Device;  
Exit Tube





Touch Panel

1-2



## Pneumatic Panel

### 1.4 Installation

- **“THE FOAMER”** should be placed on a level surface and the wheels in the locked position.
- Plug the power cord into a 110 Volt 20 amp receptacle.
- Connect the air line to the **“THE FOAMER”** via a ¼” quick disconnect. Air should be a minimum of 110 psi.

## PART 2 OPERATING **“THE FOAMER”**

- Remove Cover by pulling the right back side of the cover out and bringing it forward.
- Move the cylinder piston to the far left.
- Unlatch the chamber and open lid. Remove the can adapter from the top of the reservoir chamber.
- Insert the high temperature polymer bag into the top of the reservoir by placing the end of the tube through the bottom of the reservoir and through the clamping valve into the reaction chamber. Route the thermocouple wire between the bag and the reservoir and plug the thermocouple end into the female thermocouple receptacle located on the back top wall of the chamber. The bag will be in place when there is approximately 1” of tube on the inside of the reservoir.

- Conform the bag to the inside walls of the reservoir and fold the end of the bag over the outside edge of the reservoir.
- Place the gallon can adapter on top of the reservoir to hold bag in place.
- Connect air to the “up and down” valve using a quick disconnect.
- Pour asphalt into the reservoir using **Extreme Caution**
- Set the Main Regulator for 100 psi.
- Power up the touch panel by touching the “on” switch located on the left side of the screen.
- Go to the “SetUp” screen and press on the Asphalt SP icon. Enter the temperature and press on the bottom left arrow.
- Press on the “exit Temp” button, enter the exit temp and press on the bottom left arrow.
- Press on “Target SP” and enter the amount of asphalt in grams to be foamed and press on the bottom left arrow.
- Press on the “Soak Time SP” and enter the amount of time that you want the asphalt to stay at SP temperature up to 60 minutes. The ambient asphalt will melt down into the reservoir and the soak timer will allow for proper heating of the asphalt.
- Press on the water percent icon and enter the percentage of water that will be used in the foaming process.
- Remove water fill plug on the top of the water tank. Fill to level indicated on sight glass. Ordinary tap water will do. Tighten fill plug.
- Open the ball valve on the bottom of the water tank and the ball valve on the top of the water tank.

- Verify the asphalt temperature by a traceable thermometer before clicking on the “Foam” button. Check by unlatching and lifting the chamber lid.
- Once the asphalt has reached temperature the “Foam” button will appear. Pressing “Start” and then “Foam” starts the foaming process. The process will continue until target grams have been reached.

## PART 3 MAINTENANCE AND TROUBLE SHOOTING

### 3.1 Maintenance

“The Foamer” requires very little maintenance. Always use filtered air when connecting air source to main regulator. Moving parts are powered by air and require no maintenance. When cleaning the touch screen panel, do not use an oil based solvent.

### 3.2 TROUBLE SHOOTING

Chamber will not raise or lower

Check air supply

Make sure bearing locks are loose

Ejecting asphalt but no foam

Check air supply

Check water supply

Check that air is bled from water line and comes out of nozzle or tube

Make sure asphalt temperature is at a foaming temperature

Re-boot PLC (turn main breaker off and back on)

Asphalt not heating

Check thermocouple in reservoir

Check main breaker

Check set-point on touch panel

Check relays on main electrical panel

Asphalt continues to run

Check air supply

Check output voltage on load cells

Calibrate load cells

Part 4 CALIBRATION

4.1 LOAD CELL CALIBRATION

- Let Foamer electronics warm up for 30 to 45 minutes.
- Check voltage at term +43 and -53. Should be 9.8 vdc to 10.1 vdc. If not in this range adjust by turning "excitation" on Slim pack.
- Make sure reservoir, 1 gallon can adaptor and table are on load cells. All weight calibrations 0 - 5kg require this. Do not remove these from scale.
- Check the voltage at Slim pack terminals +41 and -42. Should be 10.0mvdc to 13.0mvdc.

- Add 5kg weight in reservoir and check +41 and -42. Should be 17.0mVdc to 20.0mVdc.
- Check at +51 and -52. Should be close to 0Vdc. If not in range adjust "zero" on Slim pack. Close to 0Vdc is ok.
- Put 5kg in reservoir and check voltage at +51 and -52. Should be +5Vdc. If not in range adjust "span" on Slim pack.
- Remove 5kg weight and check for close to 0Vdc and adjust "zero" as necessary.
- Add 5kg weight and adjust "span" as necessary.
- Repeat above until close to 0Vdc empty and +5Vdc with 5kg.
- After this calibration it doesn't matter if empty volts on +51 and -52. It only matters that one gram of added weight makes volt go up 1mV (1gr=1mV or 1kg=1.0Vdc).
- Verify the weight on the panel screen is in relation to the test weight placed in the reservoir.
- The weight on the screen does not "Tare" or "Zero" and is only used as a reference.

#### 4.2 WATER PERCENTAGE

The water percentage can be checked at the foaming nozzle once you are familiar with the elapsed dispensing time and flow rate of the asphalt. Dispensing time of asphalt will be determined by viscosity (asphalt grade and the temperature). Once times and amounts are known they can be divided by the amount of collected water.

Make sure the Asphalt Temp and Exit Temp is set to zero and no asphalt or bag is in the reservoir and the one gallon can adaptor is installed. Remove the exit tube from the reaction chamber by loosening the four screws (+). 2 in the front and 2 in the back. Enter a fictitious set point (for example 200gr) in the Target Set Point box under Foamer Setup. This will allow the Foamer to run and dispense water continually. This will also assist in bleeding of air from the water line and charge the nozzle.

Press the Start button and then the Foam button. The Foamer will come on and start releasing atomized water from the nozzle. If no water comes out let the air bleed from the water line until water is discharging. With a stopwatch or timer, place beaker under the reaction and immediately start to time. The amount of time to collect water is determined by the amount of time it took to dispense 100gr of asphalt. Divide the collected water amount into the amount of asphalt to determine the percentage.

Increasing the Nozzle Water Pressure will increase the percentage of water. Decreasing the Nozzle Water Pressure will decrease the percentage of water.

Increasing the Nozzle Air Pressure will decrease the percentage of water. Decreasing the Nozzle Air Pressure will increase the percentage of water.

Adjustment of either Nozzle Water and or Nozzle Air Pressures will also change the reaction characteristics of the asphalt.

The water percentage has been preset at the factory to be within +/- 10% of Water Percentage Set Point. The proper temperature of the

asphalt is the key to achieving the percentage of water in relation to the Set Point percentage. This is the optimal foaming temperature of asphalt as well.

Other water percentage changes may be done in the controlling program and should be done by qualified personnel.