



PTI's Pugmill Mixers

USER GUIDE FOR

“Single Pugmill Mixer”

“Double Pugmill Mixer”

ASPHALT PLANT MIXING IN THE LAB

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Introduction

The Paving Industry has had an efficient Pugmill Mixing operation at the asphalt plant to produce paving materials for many years; however mixing of asphalt and aggregate in a Laboratory has not been so efficient. Lab mixing has been highly variable over the years. This variability not only hinders agreement among laboratories but also may not represent the asphalt plant produced mixture very well.

Pavement Technology, Inc. (PTI) strives to place improved technology in Laboratory equipment. For this reason we have introduced a mixer to the industry that can simulate the excellent mixing quality of an asphalt plant in the laboratory.

PTI's MiniPugmill mixer has two shafts turning in opposing directions with augers. The augers turn in a manner to thoroughly mix the materials with minimal particle size reduction.

The efficient mixing at the proper temperature and asphalt content yields a miniature asphalt plant batch that closely simulates the film thickness and consistent coating enjoyed many years by the full sized asphalt plant.

The Mini-Pugmill can improve laboratory mixing immensely.

PTI manufactures two mixers: a double pugmill, which has two mixing chambers, and a single pugmill, which has one mixing, chamber.

The Mini-Pugmill mixer reduces mix design time and produces a consistent well-coated mixture for laboratory test specimens in 45-60 seconds.

These mixers can prepare mixture for the Asphalt Vibratory Compactor (AVC) to compact beams or 150 mm cylindrical specimen for the Asphalt Pavement Analyzer (APA) or for any other purpose where laboratory preparation of asphalt mixtures is needed.

SAFETY

Safety is very important in any laboratory work. Several points should be at the forefront of a person's mind when operating the Mini-Pugmill mixer:

- Always wear eye protection when pouring aggregate and asphalt cement into mixing chamber.
- Aggregate entering the mixer is Hot!
- Asphalt cement is hot, will burn, and will stick to skin.
- Mixture dumped from the mixer is hot.
- Outside of chamber area is Hot!
- For a burn, the very important first step is to cool the area burned; and do so quickly. Water and/or ice, are good for removing heat. Removing asphalt cement is not important. Removing heat is.
- Turning augers will crush fingers. Always disconnect power before removing the top safety grid or end plates.
- Be sure the unit is electrically grounded.

Specifications

Single Mixer

Dimensions

Width: 120cm (47")
Depth: 64cm (25")
Height: 125cm (49")
Weight: 500kg (1100lbs)

Double Mixer

Dimensions

Width: 163cm (64")
Depth: 64cm (25")
Height: 125cm (49")
Weight: 672kg (1480lbs)

Requirements

Electrical: 208/230 VAC, 60HZ, 20AMP, 1Phase 220V 50hz
Plug Type: 4 Wire twist lock NEMA#L14-20
Compressed Air: 3 SCFM @ 827 Kpa (120 psi minimum)

Optimum Mix Range

Mix: 9Kg. to 20Kg. (20-45lbs) per chamber

Unpacking and Installing

- Remove top and sides of shipping container.
- Lift mixer off container base with forklift.
- Roll mixer to the desired area.
- Make sure main power switch is in the “off” position
- Plug in electric cord to correct power supply.
- Connect to air supply.
- Switch main power “on”.
- Open and close slide several times. If slide gates stick, adjust air on regulator until gates slide easily. There are also adjusting screws on the slide supports.

The Mini-Pugmill Mixer is ready to use.

Operating the Mini-Pugmill Mixer

Plug in the power supply cord.

Connect the air supply.

Switch the main power supply to ON. The Emergency Stop Switch is this main power switch.

Set the desired chamber temperature by pressing the UP or DOWN arrows on the digital temperature controllers. Turn the switch below the temperature controller to the ON position. Either mixing chamber may be used independently of the other, or both chambers may be used. There may be a slight temperature difference in the chamber temperature and the control temperature.

The Mini-Pugmill Mixer should be turned on 2 hours prior to mixing.

For testing purposes, aggregate and asphalt binder have already been mixed in the pugmill chamber. This is done to not only test the mixing chamber, but to also fill tiny voids and actually condition the mixing chamber and to seat the paddles. **It may be necessary to re-condition the mixing chamber before mixing actual batches.**

Re-condition chamber by pre-heating to 380°F. Introduce approximately 3000 to 4000 grams of fine graded aggregate and asphalt binder into mixing chamber and mix for 3 minutes. Open slide gate and empty chamber. Continue to run pugmill with slide gate open for another minute.

Start the mixer shaft turning by pressing the green START button on the control panel. Mixing speed can be increased by using the arrows on the frequency drive.

The pre-heated aggregate should be dumped into the mixer using the door to top of the chamber while the mixer is running. With the mixer shaft continuing to turn pour the binder into the mixer, evenly distributing the binder over the aggregate. This procedure will produce a better mix between the aggregate and the binder in a short amount of time.

Mix for approximately 1 minute. For best mixing results, it has been determined that at least a 4500 gram batch should be used. Batches as large as 16,000 grams may be mixed in the pugmill mixer.

Place the receiver pan under the mixer chamber. Drop the mixture into the pan by pulling the black knob located on the panel beside the chamber. This knob opens the pneumatic sliding door in the bottom of the mixing chamber.

Note: PTI recommends that the sliding door be opened and closed several times to loosen any remaining materials. The mixer shafts should be turning during the dumping operation.

Press the red STOP button to stop mixer shaft rotation.

When all mixing is completed, switch the main power supply to **OFF**.

Removing Augers

1. It is important that the augers are matched “Right” and “Left” when removing and replacing. Augers are stamped on one end either “L” or “R”. The stamped ends always face out towards the door opening.
2. The shafts will need to be in the proper alignment to reinstall the augers. Refer to picture below.



Edges of shafts should be in this position when removing and installing augers

3. The “L” auger flights always position inside the “R” auger flights as show in the below picture.



Maintenance

- Lubricate the three (3) pillow block fittings and one (1) fitting on the gear guard. Remove the steel enclosure to access the four (4) grease fittings.
- Lubrication frequency should be every 6 months, more frequent for heavy use.
- Always dump the mixture when it is hot. Do not allow mixture to become cold in the mixing chamber.
- To access the augers, remove the four (4) wingnuts and lift the access plate away (Unplug electric cord first).
- To remove the augers assembly, remove the 5/16" Allen bolt from the end of the shaft and pull the paddle assembly from the shaft.

Electrical Drawings

See enclosed drawing in manual.