TROXLER®
The Leader in Construction Testing Equipment

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Application Brief

Troxler Automatic Drying Unit
Model 5151

Vacuum Drying Mechanism for Asphalt Cores, Mix and Aggregate

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Introduction

The Troxler Automatic Drying Unit is a vacuum drying mechanism for the quick drying of asphalt cores and loose mix /aggregate samples. This device is manufactured by Troxler Electronic Laboratories, Inc., the industry leader in construction material testing equipment. The Automatic Drying Unit provides a rapid drying method for compacted asphalt road cores that come from the jobsite wet and must be quickly analyzed for density. The Automatic Drying Unit is offered with or without a pump to save you money; buy only what you need! This equipment is ideal for quick analysis of road cores in order to acquire same day data for correlation purposes or simply to know that the asphalt placed that day meets specifications. The Automatic Drying Unit complies with ASTM standard D-7227 and standard AASHTO PP75.

Traditional Methods

The Automatic Drying Unit takes the place of slower sample drying methods. The common method of placing cores in front of a fan or in a low temperature drying oven for several hours while weighing intermittently until the weight loss stabilizes will no longer be necessary. The typical drying time for the Automatic Drying Unit is between 10 and 20 minutes, saving you hours of waiting! The core density can often be determined within 30 minutes of arriving in the laboratory!

Troxler Technology

The Automatic Drying Unit is simple to use and self-driven. The operator simply places the sample on the sample tray in the chamber, presses the Enter button and waits for the beep which indicates the sample is finished. The chamber is large enough to fit a 150 mm (6 in) diameter sample that is 200 mm (8 in) tall. Multiple smaller samples can also be placed in the chamber together.

Once the cycle is started the vacuum pump begins to draw the air out of the sample chamber. Once the air is evacuated, water is then drawn out of the sample. The attached heating mechanism allows the sample to remain close to room temperature by warming the air in the chamber. When the pressure reaches a predetermined level the sample is determined to be dry and the Automatic Drying Unit will indicate that it is finished. If the run time reached 20 cycles before the predetermined pressure is reached, the unit will ask you to turn the sample and restart the cycle. Typically the remaining run time is short before drying is complete.

The moisture that is removed from the asphalt sample is pulled through the attached tubing and allowed to condense in the moisture reservoir. This is to keep the water from entering the pump and mixing with the pump oil. Allowing water to enter the pump will shorten the life of the pump. It is recommended, but not required, that the moisture reservoir unit be attached between the ADU and the pump when drying a sample.

The ADU can also be used to dry loose aggregate or asphalt mix. This process is very similar to drying a compacted core sample except that the loose sample is first placed inside the aggregate bag provided with the unit. Never attempt to dry a loose sample without properly securing the material in the aggregate bag, this could damage the ADU and void any remaining warranty. To calculate the moisture content of a loose aggregate, follow the typical procedure used when drying the sample in an oven. Simply weigh the sample before drying, place sample in the ADU and run through a cycle. Weigh the material after the cycle and calculate the percent moisture that was contained in the sample.

Data Storage and Output

The Troxler Automatic Drying Unit automatically stores the most recent 25 data records and the 4 most recent pressure calibration records. This information could be referenced, if needed, to view the ADU's performance history. This data can be viewed on the display screen or downloaded to a computer using Hyperterminal or TerraTerm software applications (which are widely available for free).

Summary

The Automatic Drying Unit is the latest piece of laboratory equipment to be offered by Troxler Electronic Laboratories that makes the laboratory technician's job simpler, allowing them to be more productive in their daily duties. The asphalt core samples brought in to the lab from the jobsite can often be dried and analyzed in 30 minutes or less. Additionally, aggregate samples can be dried in this unit speeding up yet another test procedure that the lab technician once waited hours for. The days of waiting overnight for a sample to be dried are over.

Specifications

Troxler Model 5151 Automatic Drying Unit

Size (WxDxH)	25" W x 10" D x 12" H (63.5 x 25.4 x 30.5 cm)
Shipping Dimensions	ADU- 30" W x 20" D x 20" H (76.2 x 50.5 x 50.8 cm) Pump- 22" W x 16" D x 16" D (55.9 x 40.6 x 40.6 cm)
Weight	23 lbs (10.4 kg)
Shipping Weight	ADU- 50 lbs (22.7 kg) Pump 35 lbs (15.9 kg)
Storage Temperature	-70º to 185º F (-55º to 85º C)
Operating temperature	12 º to 38.º C (55º to 101º F)
Drying time	Moisture content dependant; 10 to 20 min. avg.
Power	12 V DC
Calibration	Internal pressure check is performed daily (minimum)