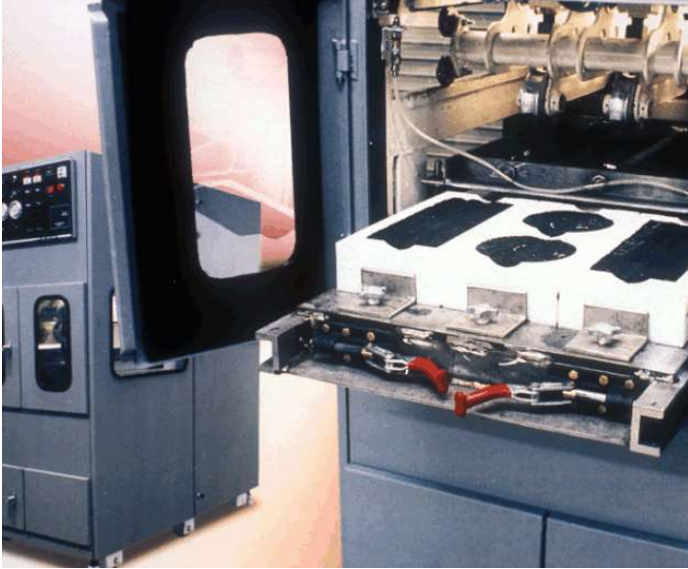


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Asphalt Pavement Analyzer (APA)



APA Rut Testing Utilizing Concave
Wheels and Rubber
Hoses(AASHTO T340-10)



Rutted Superpave Asphalt Samples
Utilizing the Hamburg Test Method
AASHTO T324-14)



Rutted Superpave Asphalt Samples
Utilizing the APA Test
Method(AASHTO T340-10)

Specification

General:

The Asphalt Pavement Analyzer (APA) is a multi-functional Loaded Wheel Tester (LWT) used for evaluating the susceptibility of permanent deformation (rutting), fatigue cracking, and moisture damage of asphalt mixes.

The APA can perform the Hamburg Test Method(AASHTO T324-14) utilizing solid steel wheels in an environmentally controlled chamber and the APA Rut Test(AASHTO T340-10) utilizing concave wheels and rubber hoses in an environmentally controlled chamber .

The APA can test three rectangular (Vibratory Compacted, Rolling Wheel Compacted, Roadway Slabs, and Other Beam Samples) or six cylindrical (Superpave, Hveem, Marshall, Roadway Cores, Other Cylindrical Samples) samples simultaneously. Testing time for Hamburg Testing (20,000 passes) is 6 hours and 49 minutes and APA Rut Testing (8000 Cycles) is 2 hours -15 minutes. The testing time for fatigue cracking evaluation is dependent upon the fatigue behavior of the system being evaluated.

The APA is capable of performing testing of asphalt samples at multiple speeds and multiple rates of loading utilizing a frequency drive.

The APA is also capable of performing testing at high contact pressures of 250+psi (Airport Runways, Taxiways, Etc.)

All measurements for rutting and fatigue are obtained utilizing a personal computer. The computer plots each measurement and displays the data in a numeric and graphical format. This system allows the user to obtain 5 or more measurements during a single pass over a beam specimen and 3 or more measurements during a single pass over a cylindrical specimen. The system is extremely accurate and can calculate the data up to .00001 of a millimeter. Below is the Specification for the Computer:

- **Intel/Windows PC Based PLC**
- **Data Output-Microsoft Excel**
- **DVD+/- RW/CDROM Drive**
- **17" Flat Screen Monitor**
- **HP Color Printer HP Color Printer**

Overall Dimensions:

Width: 88.90cm (35 inches)
Length: 177.80 cm (70 inches)
Height: 203.20 cm (80 inches)
Weight: 1357.47 Kg (3000 lbs.)

Electrical Requirement:

208 VAC, 60HZ, 40 Amp, Single Phase – 4 wire, NEMA#14-50P

Compressed Air Requirement:

8 SCFM @ 827 Kpa (120 PSI)

Water Tank Capacity:

4.68 CuFt, 35 Gallons full

LWT Basic Components:

- A) Wheel tracking/loading system
- B) Sample holding assembly
- C) Temperature control system
- D) Water submersion system
- E) Rut depth measurement device
- F) Operating controls
- G) Sample temperature pre-conditioning shelves
- H) High Feature for Airport Runways, Taxiways, Etc.
- I) Hamburg Type Testing

A) Wheel Tracking / Loading System: The wheel tracking and loading system applies wheel loading on repetitive linear wheel tracking actions with controlled magnitude and contact pressure on beam or cylindrical samples for rutting, fatigue, and moisture damage testing. This system consists of the following components:

A1) Driving Assembly, consisting of a gear motor and cam connected to the loading assembly through a sliding frame and drives the loading assembly at 60rpm frequency and 12-inch stroke.

A2) Loading Assembly, consisting of a sliding frame, three independent pneumatic cylinders (250 lbs. Capacity), each attached with an aluminum wheel, and individual solenoids, able to develop an adjustable contact pressure up to 200 PSI.

A3) Hose Rack Assembly (Stainless Steel), equipped with three (3) hoses, each having a quick release fitting.

a1) Rubber Hoses, special high-pressure GATES 77B ¾ inch 750 PSI.

B) Sample Holding Assembly: The assembly holds the samples directly underneath the concave wheels/rubber hoses or solid steel wheels to allow the samples to be subjected to the wheel tracking actions during testing. A sliding tray that allows the samples to be pulled out from inside the machine making it easy to install the samples and to perform test measurements. The assembly consists of the following components:

B1) Sample Tray, (Stainless Steel) which has two track rollers on each side bearing against rails. When the sample tray is in testing position it can be locked against the frame by two toggle clamps.

B2) Sample Molds, twelve (12) High Density Polyethylene (HDPE).

- Three (3) each for beam specimens,(rutting), 300 mm \pm 0.5 mm in length, 125mm \pm 0.5 mm in width, 75mm \pm 0.5 in height.
- Three (3) each for cylindrical specimens, (rutting and/or moisture damage), 150 mm \pm 0.5 in diameter, 75mm \pm 0.5 in height.
- Three (3) each for fatigue crack testing, 300 mm \pm 0.5 mm in length, 125mm \pm 0.5 mm in width, 75mm \pm 0.5 in height, with end restraining brackets.
- Three (3) each for Hamburg Type Testing, 300 mm \pm 0.5 mm in length, 152mm \pm 0.5 mm in width, 62mm \pm 0.5 in height.

C) Temperature Control: heating and cooling of the main chamber is accomplished by a series of heating strips and a cooling unit, which are regulated by a microprocessor based temperature controller. The temperature can be controlled from 4° C to 72° C \pm 1.5° C (39° F to 162° F). **Optional Cold Plate will allow temperatures down to -10C. This feature is used for Studded Wheel Testing.**

D) Water Submerging System: A water submerging system allows water to cover the test samples during the submerged water test and readily drains when testing is completed and before the sample tray is disengaged from the testing position. The system consist of the following components:

D1) Water Tank (Stainless Steel) with heating element and external pump for introduction of water into reservoir.

D2) Water Reservoir -Capacity Approx. 30 gal. (Stainless Steel) which can be raised and flooded with water for submerged-in-water testing. The reservoir is equipped with a pneumatic cylinder, which allows it to be raised and lowered as needed. The reservoir is equipped with a weir valve on the back to allow draining back into the tank. When pumping, a constant water level of approximately ½ inch over the top of the test specimen is maintained during the submerged-in-water test.

D3) Pneumatic Cylinder to raise and lower the water reservoir.

E) Rut Depth Measurement Device: Temposonic Transducers are used to obtain measurements.

E1) Calibration Device, for calibrating wheel load, with 0.001 inch precision.

F) Operating Controls: The operating controls utilize a PLC PC Based Control System. All calibration and operation of the APA is performed utilizing a personal computer.

G) Sample Temperature Pre-Conditioning Shelves: These shelves are located at the base of the APA. These shelves are used to bring test specimens up to a desired temperature.

G1) Enough space is provided for preconditioning of three (3) beam samples or six (6) cylindrical samples while testing is in progress.

H) High Pressure Feature for Airport Runways, Taxiways, Etc.: The high pressure option allows for testing at high contact pressures at 250+ psi.

H1) High-Pressure Air Hoses and Fittings

H2) Booster Regulator (2 to 1 Air Pressure Ratio Increase)

H3) (3) 2-1/2" Pneumatic Cylinders

H4) High-Pressure Safety Valves (Locks air between the hose rack and the Valves)

H5) (1) 750 pound load cell (Measures APA Wheel Loads)

H6) (1) High-Pressure Gauge (Mounted on the Hose Rack to Verify Hose Pressure)

I) Hamburg Type Testing: The APA utilizes solid steel wheels and allows the machine to run the Hamburg Test Method AASHTO T324-14. A frequency drive allows you to run tests at multiple speeds and multiple rates of loading.