

## ASPHALT PAVEMENT ANALYZER-JUNIOR (APA JR.)

### SPECIFICATION



#### General:

The APA-Jr. is a multifunctional loaded wheel tester that is used to evaluate Cold Mix, Warm Mix, and Hot Mix asphalt in a dry or submerged in water condition. The APA Jr. automatically displays in a numeric and graphical format the real-time development of permanent deformation. The APA Jr. is CE approved and meets all provisions of EN12697-22.

The APA Jr. can perform the AASHTO T 324-14 Test Method (Hamburg Test Utilizing Solid Stainless Steel Wheels) and the AASHTO T 340-10 Test Method (Rut Testing Utilizing Stainless Steel Concave Wheels and Hoses),

The APA Jr. has a frequency drive that allows a user to test mixes at multiple speeds and multiple rates of loading.

The APA Jr. has a "High Pressure Feature" that allows a user to perform High-Pressure testing at High Contact Pressures of 250+psi (Airport Runways, Taxiways, Intersections, Etc)

The APA Jr. incorporates electronic digital regulators that allow a user to set and maintain the load during a test. These regulators combined with the PLC PC based control system allow a user to change load during a test if desired.

### Options

- **Chiller for Low Temperature Fatigue Testing on Asphalt Beam Specimens. The beam specimens are compacted with the Asphalt Vibratory Compactor (AVC). Chiller also allows a user to perform Studded Tire Wear at Low-Temperatures. This option comes with (2) Studded Wheels, (2) Aluminum Molds, and Software.**
- **Microsurfacing/Slurry Seal testing capability(Test Method TB 109 and TB 147)**

The APA Jr. charts depth versus stroke count and depth versus elapsed time. The APA Jr. control system is capable of determining the "Rate of Rutting". The APA Jr. can test the following type samples:

- Cylindrical
  - Gyrotory
  - Marshall(4" and 6")
  - Hveem
  - Roadway Cores
  - Other Cylindrical Samples
- Beam
  - Vibratory
  - Rolling Wheel
  - Slabs
  - Other Beam Samples



**Completed Hamburg Test with Gyrotory Samples**

The APA-Jr. has two standard loaded wheels

- Hamburg-Type-Solid Stainless Steel Wheels
- APA Stainless Steel Concave With Hoses for Rut Testing

Optional Wheels available:

- Rubber Wheels for Slurry Seal/Microsurfacing Testing(Provided if Slurry Seal Option is Purchased)

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- Solid Stainless Steel Wheels for Fatigue Testing(Provided if Optional Chiller is Purchased)
- Rubber Wheels with Metal Studs (Provided if Optional Chiller and Cold Plate are Purchased. Temperature range down to -5F[-20C])

The APA-Jr. is operated utilizing a PLC PC Based Control System. The operating system allows a user to perform all calibrations and functions directly with a Personal Computer.

All measurements for rutting and fatigue are obtained utilizing a personal computer. The APA Jr. has "Reed Switches" which allows the user to obtain up to 5 measurements during a single pass over a beam specimen and up to 3 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: 68.58cm (27 inches)  
Length: 114.30 cm (45 inches)  
Height: 154.94 (61 inches)  
Weight: 590.90 Kg (1300 lbs.)

### **Electrical Requirement:**

208/230 Volt, 50Hz or 60Hz, 40 Amp, Single Phase

### **Compressed Air Requirement:**

8 SCFM @ 827 Kpa (120 PSI)

### **Water Tank Capacity:**

2 Cu Ft. 15 Gallons Full

### **Water Tray Capacity:**

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1.6 Cu Ft. 12 Gallons Full

**APA Jr. Basic Components:**

- A) Wheel tracking/loading system
- B) Sample holding assembly
- C) Temperature control system
- D) Speed
- E) Water submersion system
- F) Vertical Measurement System
- G) Rut depth measurement device
- H) Operating controls

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 cylindrical or beam 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 variable frequencies (0-120 passes per minute) and up to a 12-inch stroke.

A2) Loading Assembly, consisting of a sliding frame, two independent pneumatic cylinders (250 lbs. capacity), each attached with a Wheel(8" Solid Stainless Steel, 6" Concave Stainless Steel, or 3" Rubber), and individual solenoids, able to develop an adjustable contact pressure up to 250+ PSI.

A3) Hose Rack Assembly (Stainless Steel), equipped with two (2) hoses and high pressure airlines and fittings.

B) Sample Holding Assembly: The assembly holds the samples directly underneath the Wheels to allow the samples to be subjected to the wheel tracking actions during testing. A Fold-Down Water Tray Gate that allows the samples to be placed inside the chamber for testing and removed from inside the chamber after a test is complete. The assembly consists of the following components:

B1) Sample Molds, Four (4) Ultra High Molecular Weight (UHMW).

- Two (2) each for Hamburg Type Testing, 150 mm  $\pm$  0.5 mm Diameter x 62mm  $\pm$  0.5mm in height. (Additional sizes can also be provided)

- Two (2) each for cylindrical specimens, (rutting and/or moisture damage), 150 mm  $\pm$  0.5 in diameter, 75mm  $\pm$  0.5 in height.

\*Molds can also be provided for the Fatigue Testing Option, Studded Wheel Option, and Slurry Seal Option.

C) Temperature Control System: heating and cooling of the main chamber is accomplished by a series of heating elements inside a heater box and a heater fan. An optional cooling unit, which is regulated by a microprocessor based temperature controller. The temperature can be controlled from -9° C to 80° C  $\pm$  1.5° C (15° F to 176° F).

D) Speed: Utilizes a Frequency Drive that allows variable speed from 0 to 120/passes per minute.

E) Water Submersion System: A water submerging system allows water to cover the test samples inside the water tray during a submerged water test and readily drains when testing is completed. The system is temperature controlled up to 80C and has a continuous circulating water system. The system consist of the following components:

E1) Water Tank (Stainless Steel) with heating element and external pump (continuous circulating) for introduction of water into reservoir. Capacity 15 gallons.

E2) Water Reservoir -Capacity Approx. 12 gal. (Stainless Steel) which is flooded with water for submerged-in-water testing. 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.

F) Vertical Measurement System: Linear Position Transducer

G) Rut Depth Measurement Device: Temposonic Transducers (Mounted inside pneumatic cylinders) are used to obtain all measurements.

G1 Calibration Device, for calibrating wheel load, with 0.001 inch precision.

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