IPC global
A Division of CONTROLS

ADVANCED
PAVEMENTS
TESTING

# AMPT PRO

## Next Generation Asphalt Mixture Performance Tester




www.controls-group.com




IPC Global, the researcher's choice for advanced asphalt testing equipment has again set the benchmark for innovation and performance with the new AMPT PRO.

- AMPT Pro has been designed with the latest technologies and product developments to ensure that it surpasses any other product on the market.
- AMPT Pro fully complies with AASHTO T378 (TP79) and can perform the three asphalt tests of NCHRP Projects 9-19 and 9-29 — Dynamic Modulus, Flow Number and Flow Time with ease.
- In addition AMPT Pro can also perform Uniaxial Fatigue / SVECD, Overlay Test, Semi-Circular Bend, Indirect Tensile Dynamic Modulus, Small Diameter Dynamic Modulus, and iRLP



Gauge point fixing jig



Detail of AASHTO T378 dynamic modulus configuration

**AMPT PRO will help you:**

**Improve**

- → Mix designs that perfor Structural designs
- → Pavement life and reduce maintenance specimens.

**Evaluate**

- → HMA mixes
- → Modified HMA

**Create**

- → Master curves

**Analyze**

- → Pavement failure

AMPT PRO

# Features and Benefits

### Lower Temperatures

Significantly improved ECU performance and innovative cell design allow the AMPT PRO to rapidly reach sub zero temperatures previously not possible.

### All-in-One Computer Control

AMPT Pro is ready to work straight out of the box with the latest All-in-One touchscreen PC technology at your finger tips (optional).

### Easy and Versatile

AMPT PRO features interchangeable transducers and load cells with "plug and play" signal conditioners allowing for quick and easy transition of test set-ups.

### Clarity in Results

Controlling the AMPT PRO is IPC Global's third generation Integrated Multi-Axis Control System (IMACS2). The tried and tested IMACS2 delivers leading edge performance, unparalleled control and the ultimate in flexible data acquisition.




### High Performance

At the heart of the AMPT PRO is an all new Hydraulic Power Supply utilizing inverter technology coupled with a high performance labyrinth bearing actuator to deliver 19kN of force, greater reliability and longer service life.

### Rapid Cooling

Experience increased productivity with AMPT PRO's rapid cooling functionality. AMPT PRO can cool from an ambient temperature of +23°C down to +4°C in under 30 minutes and reaches temperatures down to -10°C.

### Fully Integrated (Optional Air Compressor)

Fully integrated and compact in design the AMPT PRO is the perfect solution for both static and mobile testing facilities. An optional integrated air compressor eliminates the need for an external air compressor with the whole system only requiring power to operate.

### Testing Efficiency

AMPT PRO has been designed as an easy-to-use and ergonomic testing system that greatly increases the efficiency of asphalt testing.

IPC Global's original Asphalt Mixture Performance Tester (AMPT) was the culmination of two National Cooperative Highway Research Program (NCHRP) projects. IPC Global have been involved in these projects from the beginning with development work done on IPC Global equipment. IPC Global's AMPT has been evaluated successfully by NCHRP.

## All-in-One Computer Control

Available with an optional all-in-one touchscreen PC, AMPT Pro is easy to set-up and operate. The all-in-one PC, with wireless keyboard and trackpad, minimizes cabling allowing for more workspace atop the AMPT Pro.

The PC is mounted using a spring activated desk stand that provides ergonomic support
and a high range of movement, including generous upward tilt and long arm reach.
Three points of articulation enables effortless adjustment and is the ideal solution for Activity Based Workplaces.

## Fully-integrated and Robust

IPC Global's innovative thinking has produced the all-in-one compact AMPT Pro.

A fully-integrated HMA testing machine incorporating high-performance labyrinth bearing hydraulic actuator; quiet, air-cooled Hydraulic Power Supply; refrigeration and heating unit; compressed air-driven confining pressure system; integrated triaxial cell; environmental chamber with its own temperature control unit; digital control and data acquisition system; optional integrated air compressor; and optional all-in-one touchscreen computer.

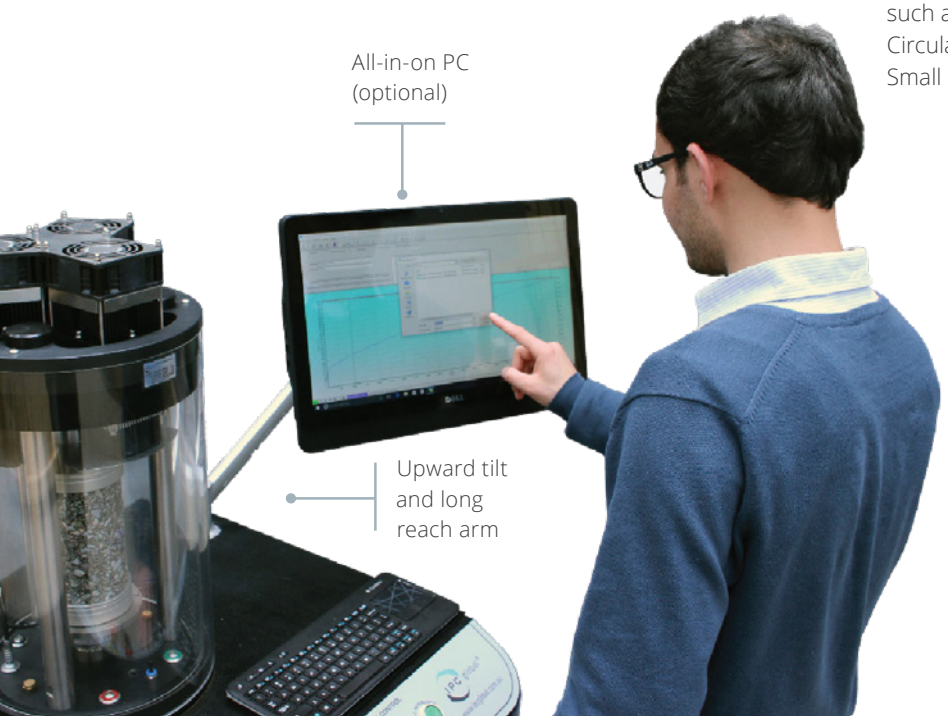
AMPT PRO benefits from an all new Hydraulic Power Supply utilizing inverter technology coupled with a high performance labyrinth bearing actuator. AMPT PRO delivers 19kN of force, greater reliability, longer service life and accurate results every time. With greater force and unparalleled control AMPT Pro provides world leading performance and is ready for future testing requirements.

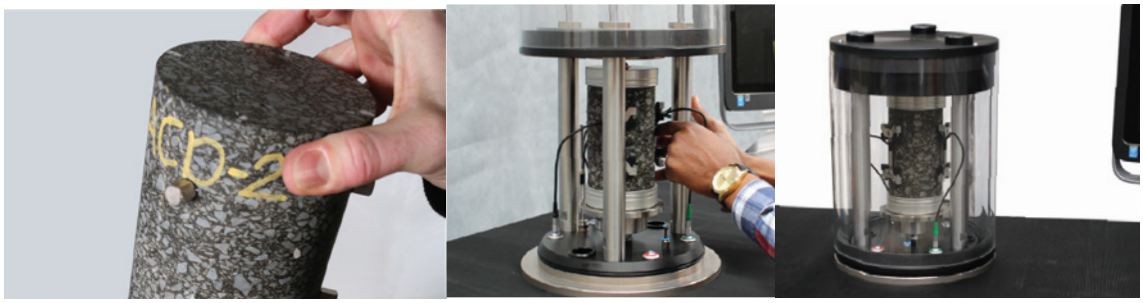
Robust and transportable, AMPT Pro is the ideal solution for both static laboratories and mobile facilities.

## A United Effort

IPC Global's original AMPT was designed to perform, and has been approved for, the three asphalt tests of Projects 9-19 and 9-29 of the National Cooperative Highway Research Program (NCHRP). AMPT PRO complies with AASHTO T378/TP79 determining the Dynamic Modulus and Flow Number for Hot Mix Asphalt (HMA).

AMPT PRO can perform all the tests of the original AMPT with greater performance as well as new tests that have been developed specifically for the AMPT such as Uniaxial Fatigue /SVECD, Overlay Test, Semi-Circular Bend, Indirect Tensile Dynamic Modulus, Small Diameter Dynamic Modulus, and iRLPD.





# Quick and Easy

## Improved Performance and Streamlined Operations

### The Ultimate in HMA Testing Tools

The system's software and controller accurately and automatically control the confining pressure. Temperature controlled air, in the integrated pressure vessel, is re-circulated by an electric fan and is regulated by an internal heat exchanger. The air temperature is measured half way up the specimen and controlled using a dedicated temperature (PID) controller that provides thermal equilibrium within three minutes of closing the cell.

- Three axial strain transducers, equally spaced around the circumference of the specimen provide strain measurement averaging and eliminate errors caused by non uniform bending during the dynamic modulus test.
- The clip-on strain transducer mounts and spring-loaded displacement transducers are quick and easy to attach. Epsilon extensometers are available as an option.
- The Swiss-made base connectors make a quick and reliable connection.

### Easily Interchangeable, Pluggable Transducers

IPC Global's AMPT PRO features easily interchangeable transducers and load cells with "plug and play" signal conditioners allowing you to quickly change between different test set-ups. The lockable side drawer and interchangeable transducers are unique to IPC Global's AMPT PRO.

### Rapid Cooling

Significantly improved ECU performance and innovative cell design allows AMPT PRO to rapidly reach sub zero temperatures previously not possible. The test chamber can cool from an ambient temperature of +23°C down to +4°C in under 30 minutes and reaches temperatures down to -10°C.




### Intelligent Testing Chamber

One of the most important features of the AMPT PRO is the specimen testing chamber. For this, IPC Global developed a new high specification triaxial cell, which doubles as an environmental chamber. The ingenious new design has improved air flow for heat removal resulting in increased energy efficiency and cooling performance. The internal fan utilizes a longer life DC brushless motor.

The crystal clear acrylic triaxial cell allows unimpeded (360 degree) view of the specimen and is automatically raised and lowered with a two-button safety interlock. This innovative design eliminates physical movement of the heavy cell assembly when changing test specimens.

# Test Kits



### Dynamic Modulus E*
AASHTO T378/TP79 | NCHRP 9-29

A performance-related property, for mixture evaluation and characterising the stiffness of HMA. It is as an important input parameter for AASHTO+ "Mechanistic-Empirical Pavement Design Guide".

- Create master curves for structural design
- Assess modified binders and local materials
- Forensic analysis of pavement failure
- + AASHTO T342/TP62 available on request, limitations apply



### Flow Number / Time / Stress Sweep Rutting (SSR)
NCHRP 9-29 | AASHTO TP134

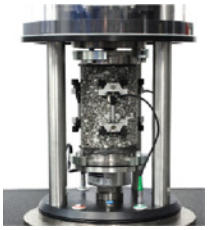
**Flow number:**
- A measure of resistance to permanent deformation
- Repeated load creep tests
- Rutting evaluation
- Accurate simulation of actual loading

**Flow time:** static creep tests



### iRLPD
AASHTO TP116

The iRLPD Kit has been designed to measure the resistance of asphalt mixtures to permanent deformation using Minimum Strain Rates from Incremental Repeated Load Permanent Deformation (iRLPD).



### Uniaxial Fatigue Kit / SVECD
AASHTO T400/TP107 (SVECD) | SCDUF

The Uniaxial Fatigue Kit allows AMPT PRO to perform tension tests (plus through zero push-pull fatigue), including the Simplified Continuum Damage Uniaxial Fatigue test (SCDUF) and Dr. Richard Kim's Simplified Viscoelastic Continuum Damage test (SVECD) AASHTO T4000/TP107.



### Overlay Test Kit
Tex-248-F | ASTM WK 26816

The advanced design provides high stiffness and extremely low compliance. This kit enables the AMPT PRO to conduct the Overlay Test for Fatigue Cracking which can be incorporated into Mechanistic-Empirical design system for flexible pavements.



### Small Diameter Dynamic Modulus Kit
AASHTO TP132

The Small Diameter Specimen Dynamic Modulus Kit allows researchers to perform dynamic modulus tests on 38mm and 50mm diameter specimens. Small diameter specimens are more easily obtainable from the field and allows dynamic modulus and flow number tests to be conducted for forensic analysis.



### Semi-Circular Bend (SCB) Kit

AASHTO T393/TP124 (IFIT)/ASTM D8044 (LSU SCB)

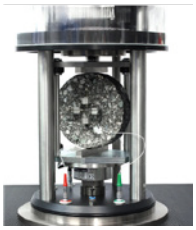
Specifically designed to determine the critical strain energy of asphalt specimens to compare the fracture properties of asphalt mixtures with different binder types.



### Small Diameter Uniaxial Fatigue Kit

AASHTO TP133

The Small Diameter Specimen Uniaxial Fatigue Kit allows researchers to perform tension tests (plus through zero push-pull fatigue), on 38, 50 or 75mm diameter specimens. Small diameter specimens are more easily obtainable from the field therefore allowing Uniaxial Fatigue Tests to be conducted for forensic analysis.



### Multi-indirect Tensile Kit

AASHTO TP131

The AMPT PRO Multi-indirect Tensile Kit is specifically designed for analysis of Dynamic Modulus of bituminous mixtures by repeated load indirect tensile testing. The modulus tests are used to characterize asphalt mixtures for performance based road pavement design.



### Proving Ring

AASHTO T378/TP79/T342/TP62/T400/TP107

Proving Ring assembly:

- Compression / Tension operation
- Dynamic Modulus E* verification
- Uniaxial Tension Fatigue SVECD verification



### Tension Platen Fixing Jig

Improve the accuracy, repeatability and efficiency of your specimen preparation with IPC Global's Tension Platen Fixing Jig. The Jig ensures accurate perpendicularity of specimens and parallel placement of platens.



### Gauge Point Fixing Jig

Improve the accuracy, repeatability and efficiency of your specimen preparation at the flick of a switch. Equipped with the ability to quickly change between two, three or four gauge point setting arms at 180°, 120° or 90° spacing the Gauge Point Fixing Jig is also fitted with a "built-in" vacuum generator and handy membrane stretcher.

# Integrated Data Acquisition and Analysis

## IMACS2 Control and Data Acquisition

IPC Global's 3rd Generation Multi-Axis Control System IMACS2 is built into our AMPT PRO Tester delivering leading- edge performance, unparalleled control and the ultimate in flexible data acquisition.

For servo-controlled testing machines, IMACS2 provides ultimate precision and waveform fidelity thanks to the integrated channel acquisition and control functions.

Sampling rates up to the industry maximum of 200kHz provide optimum test control for perfect wave-shape fidelity, while Industry leading 24bit resolution is essential to obtain the maximum benefit from the extremely high sample rates, ensures complete confidence in results, especially at high frequency tests.

**Smart Plug & Play** transducers eliminate set-up errors, increase productivity, save valuable time and reduce cost.

**Users can plug-in any compatible transducers and the controller knows what to do.**

**With IPC Global's IMACS2, you will have total confidence in your testing results.**

IMACS2

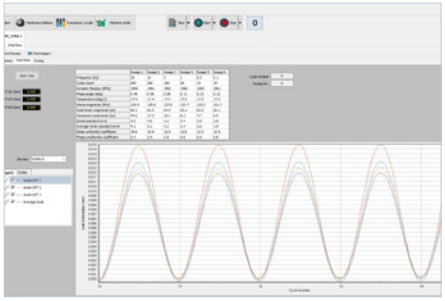
- Most advanced Control & Data acquisition with 24bit resolution and up to 200kHz sample rate.
- Smart 'Plug and Play' transducers for quick, easy and error-free set-ups.
- Integrated memory protects data in case of PC shutdown.
- Closer analysis with powerful advanced data processing.
- Ethernet communication port at 1Gb/s.
- Total confidence in measurements from analogue inputs that auto-calibrate on power-up.
- Acquisition and Control– two axis control (actuator and confining pressure), up to 8 channel data-acquisition (actuator displacement, axial load, confining pressure, temperature and 4x normalized transducer inputs e.g. for displacement).



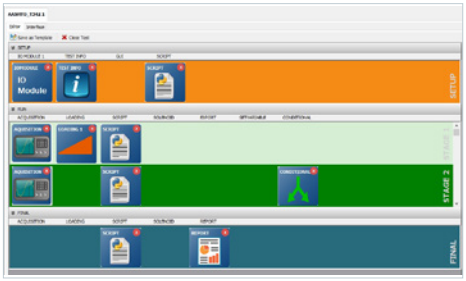
# UTS Neutron - Dynamic Materials Testing and Analysis Software

AMPT PRO is supplied complete with new UTS Neutron, the most advanced materials testing and analysis software for performance, accuracy and flexibility.

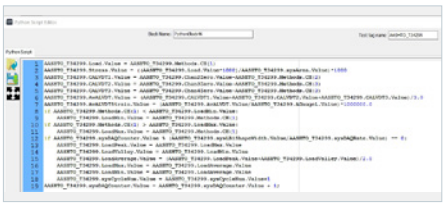
## Three Licence Levels



**ESSENTIAL** for running tests to international Standards from our extensive library with the facility to make changes to setting.



**PERFORMANCE** for those wanting to make changes to existing tests using graphical block programming.



**DEVELOPER** for the most advanced users who want totally flexibility to program any test from scratch.

UTS NEUTRON

- The most advanced materials testing and analysis software for performance, accuracy and flexibility.
- **One Software** with customizable interfaces for all testing needs.
- **Three License Levels to meet all user types:**
  - ESSENTIAL standards testing
  - PERFORMANCE Test editor
  - DEVELOPER Programmer
- **Configurable Access-Rights** for any user type e.g. QC operator, Laboratory manager, Senior Engineer.
- **User programmable —** Total flexibility capable to do anything you'll need.
- **Easy-to-follow wizard —** To make life even easier, UTS Neutron Wizard only requires you to follow the step-by-step path to accomplish your test editor goal.
- **Multiple languages —** Custom language configurator tool.
- **Advance reporting —** Robust reporting and easy custom test creation.
- **Worry free seamless migration —** Compatible with IMACS and IMACS2. Users can import existing UTS data to generate new reports.

# Specifications

**Load Capacity**: Static: 19kN / Dynamic: 17kN

**Frequency Range**: 0.01 to 70Hz sinusoidal loading

**Actuator Stroke**: 30mm (+/-15mm stroke)

**Actuator Type**: Labyrinth Bearing

**Temperature Range**: -10 to +70°C in an ambient temperature of +23°C

**Temperature Accuracy**: +/-0.2°C at temperature probe positioned close to specimen

**Cooling Rate**: Typically cools to +4°C in 30 minutes at an ambient temperature of +23°C

## Triaxial Cell

**Cell Dimensions**: 270 x 390mm (Dia. x H)

**Confining Pressure**: 0 to 225kPa

**Specimen Size**: 100 x 150mm (Dia. x H) nominally
50 x 135mm (Dia. x H)
38/50 x 110mm (Dia. x H)

## Reaction Frame

**Noise Level**: Less than 70db at 2m

**Computer Control**: Integrated all-in-one touchscreen PC (optional)

**Air Compressor and Dryer**: Low noise, integrated, automated operate-ondemand (optional)

**Dimensions**: 1,359 x 1,350 x 739mm (H x W x D)

**Weight:** 275kg (including oil)

## Transducers

**Load Cell**: Low profile pancake type

**Built-in Actuator LVDT**: 30mm Stroke

**Pressure**: 0kPa – 225kPa

**On-Specimen Displacement**:3 clip-on +/-0.5mm LVDTs, compatible with up to 4 (Various optional loose-core, strain gauge interchangeable load cells transducers available)

**Temperature Probe Range**: -25°C to +80°C

**Specimen Size**: Up to four interchangeable on-specimen displacement transducers, plus easily interchangeable load cells

## Services

**Power (without air compressor):** 220V–240V, 50Hz, single phase, 17A
208V, 60Hz, single phase, 20A

**Power (with air compressor)**: 220V–240V, 50Hz, single phase, 22A 208V, 60Hz, single phase, 25A

**Air**: Clean dry air at 450-800kPa; 2 L/sec (Optional integrated Air Compressor available)

**Hydraulic Oil**: Pre-filled with high specification pre-filtered, ISO 46 Premium Mineral Oil

## Optional Accessories

- Uniaxial Fatigue Kit / SVECD
- Overlay Test Kit
- SCB (Semi-circular Bend) Kits

## Control & Data Acquisition — IMACS2

**Configuration**: Fully integrated

**Control Loop Frequency**:Up to 25kHz

**Acquisition Speeds**: 200kHz (simultaneous on all channels)

**Data Oversampling**: At least 64x

**Data Resolution**: 24 bit auto-ranging data acquisition

**Communication**: 1x Gigabit Ethernet, 1 x 100Mb Ethernet

**Firmware Update**: Flash based

**Analogue Inputs**: Auto-calibrate on power up

**Control**: 2 axis control (actuator and confining pressure)

**Acquisition**: Up to 8 Channel data (actuator displacement, axial load, 3 to 4 on-specimen displacement transducers, confining pressure and temperature)

## Testing Standards Available

- AASHTO T378/TP79 — Dynamic Modulus E*
- AASHTO TP116 — Flow Number/Stress Sweep Rutting (SSR)
- AASHTO T400/TP107— Damage Characteristic Curve from Direct Tension Cyclic Fatigue (SVECD)
- AASHTO T393/TP124(IFIT) — Fracture Potential Using the Flexibility Index Test (FIT)
- ASTM D8044 (LSU SCB) — Cracking Resistance using Semi-circular Bend Test at Intermediate Temperatures
- AASHTO T342 / TP62 — Dynamic Modulus (Limited temperature and force range)
- AASHTO TP131-Indirect Tensile Dynamic Modulus
- ASTM WK 26816 — Cracking Using the Overlay
- Tex 248-F Overlay Test — Reflective Cracking or Fatigue
- AASHTO TP116 — Rutting Resistance iRLPD

# Sample Preparation Equipment




## PReSBOX

### Asphalt Prism Shearbox Compactor

PReSBOX provides the latest in asphalt specimen preparation and mix evaluation technology. High quality asphalt prisms are produced, from which beams and cylinders with excellent air voids distribution, homogeneity and particle orientation can be cut. With minimal operator involvement PReSBOX allows rapid and repeatable production of asphalt specimens in the laboratory.



## GALILEO | GALILEO RESEARCH

### Advanced Research Gyratory Compactors

The new flagship gyratory compactor that incorporates innovative Electromechanical Servoactuation and patented Orbital gyratory motion system.




## AUTOSAW 2

### Advanced Automated Asphalt Saw

The new and improved Autosaw II is the most advanced asphalt cutting saw available and is the perfect device for advanced testing laboratories. Its fully automated asphalt sawing system with integrated clamping system allows for fast and easy cutting of rectangular beams, trapezoidal prisms, overlay test specimens, semi-circular specimens, and trimming of cylindrical specimens.



## MULTI-KOR

### Advanced Asphalt Core Drill

The Multi Core-Drill is a superior laboratory asphalt core drill whose robust and rigid design provides precise coring of asphalt prisms, cylindrical and slab samples to the highest quality. Designed to be easy to use, flexible and adaptable, it ultimately provides users with precise drilling capabilities, enabling users to have absolute confidence in the quality of their test specimens and the reliability of their test results.

GOLDEN JUBILEE

1976 - 2026

# Fifty Years of Precision

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