

IPC Global®

AMPT/SPT Asphalt Mixture Performance Tester

The Most Useful Tool Available for Evaluating HMA (Hot Mix Asphalt)



The science
of testing
made easy®





INNOVATIVE DESIGN FOR NCHRP 9-19 AND 9-29

The AMPT is specifically designed to perform the three asphalt tests of NCHRP Projects 9-19 and 9-29 - Dynamic Modulus, Flow Number and Flow Time, with ease.

The AMPT helps you to:

IMPROVE

Mix Designs that perform
Structural Designs
Pavement life and reduce maintenance

EVALUATE

HMA Mixes
Modified HMA

ANALYSE

Pavement Failure

CREATE

Master Curves

Complies with AASHTO TP79. IPC Global's AMPT can also perform Indirect Tensile Dynamic Modulus, Overlay Test and Uniaxial Fatigue with optional hardware accessories.

GREAT BENEFITS

Complete confidence in your data and results

- IPC Global AMPT is tried, tested and proven
- Involved from the start of the NCHRP 9-19, IPC Global produced the first commercial AMPT on the market

Saves you time and is easy to use

- Technician friendly—quick and easy test set-up
- Simple, reliable, accurate specimen preparation

Amazing value for money

- Fully integrated, the AMPT has everything you need
- Refined systems that are robust and reliable

The Asphalt Mixture Performance Tester (AMPT) is 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. The IPC AMPT has been evaluated successfully by NCHRP.

A UNITED EFFORT

IPC Global's 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). The AMPT complies with AASHTO TP79 Determining the Dynamic Modulus and Flow Number for Hot Mix Asphalt (HMA).

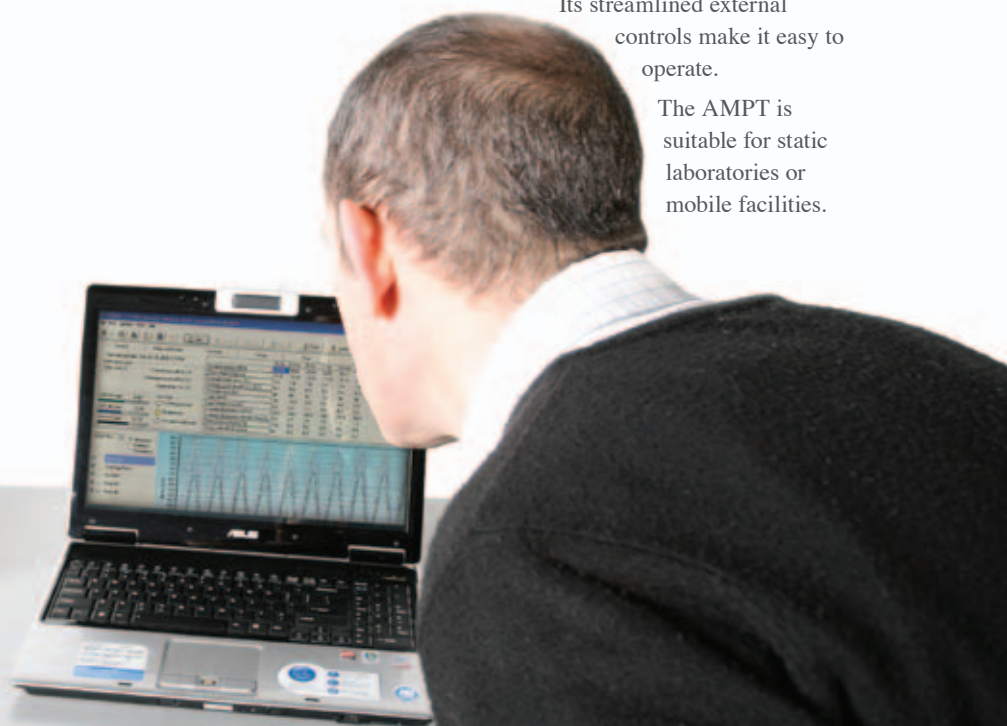
FULLY-INTEGRATED AND ROBUST

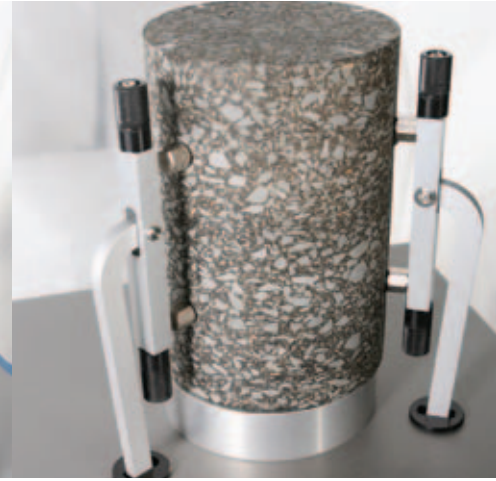
IPC Global's innovative thinking has produced the all-in-one compact AMPT. A fully-integrated HMA testing machine incorporating high-performance hydraulic actuator; quiet, built-in, air-cooled hydraulic pump; built-in refrigeration and heating unit; compressed air-driven confining pressure system; integrated triaxial cell; environmental chamber with its own temperature control unit; and digital control and data acquisition system.

The AMPT is robust and transportable.

Its streamlined external controls make it easy to operate.

The AMPT is suitable for static laboratories or mobile facilities.





STREAMLINED OPERATION

The most important feature of the AMPT is the specimen testing chamber. For this, IPC Global employs a high specification triaxial cell, which doubles as an environmental chamber.

The crystal clear acrylic triaxial cell allows unimpeded (360 degree) view of the specimen without special lighting. It is raised and lowered by the unit's compressed air system with a two-button safety interlock.

This innovative design eliminates moving a heavy cell assembly when changing test specimens. The left-mounted triaxial cell provides ample space for a laptop or PC monitor.

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 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.

IPC Global's innovative AMPT gauge point fixing jig makes it quick and easy to accurately fix gauge points for on-specimen transducers. This eliminates potential errors and saves time.

- A convenient way to glue gauge points to the specimen. Gauge points are positioned on the specimen at the flick of a switch.
- Fixing jig comes with 'built-in' vacuum generator and handy membrane stretcher.



View our online video demonstration and see how easy it is to operate the AMPT and fixing jig (www.ipcglobal.com.au)



1. Place specimen in jig



2. Mount strain transducers



3. 360° view, testing can commence

Complies with AASHTO TP79, NCHRP 9-19 AND 9-29

Superpave Performance Tests

Asphalt Mixture Characterisation Tests



DYNAMIC MODULUS E^*

Dynamic Modulus E^* , a performance-related property, for mixture evaluation and characterising the stiffness of HMA for use as an input parameter for AASHTO “Mechanistic-Empirical Pavement Design Guide”.

- Evaluate potential for **rutting** and **fatigue cracking**
- Create master curves for structural design
- Improve mixture design
- Assess modified binders and local materials
- Forensic analysis of pavement failure

FLOW NUMBER

Flow number is related to the resistance of HMA to permanent deformation.

- Repeated load creep tests
- Evaluate rutting
- Accurate simulation of actual loading

FLOW TIME

Flow time is a quick and simple measurement of the resistance of HMA to permanent deformation.

- Static creep tests
- Measure permanent deformation for rutting evaluation

IPC Global’s AMPT is the easiest and most reliable way of performing these tests.

Minimal training is needed for your technicians to become AMPT test experts.

Optional—Direct Tension Cyclic Fatigue, Indirect Tension and Overlay test packages.

ALSO AVAILABLE WITH ADDITIONAL HARDWARE



Uniaxial Fatigue Kit

The Uniaxial Fatigue Kit allows the AMPT to perform tension tests, including the Simplified Continuum Damage Uniaxial Fatigue (SCDUF) test and Dr. Richard Kim’s Simplified Viscoelastic Continuum Damage (S-VECD) test.



Overlay Test Kit

The Overlay Test Kit enables the AMPT to conduct the Overlay Test for fatigue cracking which can be incorporated into Mechanistic-Empirical design system for flexible pavements. The Overlay test investigates both crack propagation and crack initiation.



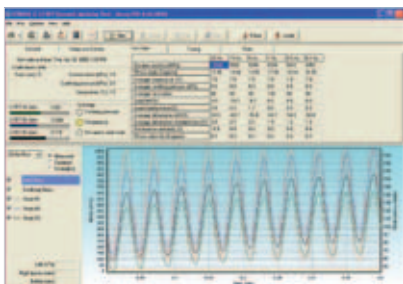
Indirect Tensile Jig

The Indirect Tensile Jig is precision Engineered to perform indirect tensile tests within the AMPT, including Dynamic Modulus and Resilient Modulus analysis.

Dynamic Modulus AASHTO TP62

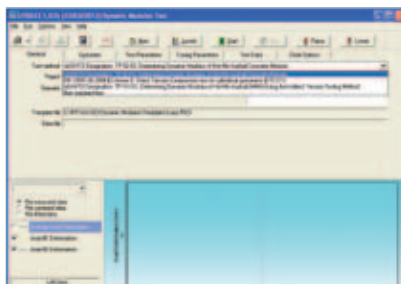
Alternative method

World-class Software Application



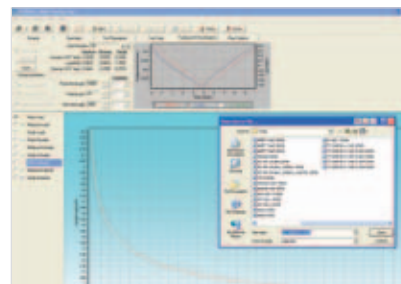
Powerful professional Delphi software

Save time analysing your materials using UTS software's clear, precise, rich, user friendly tab-based interface with multiple real time graphical displays.



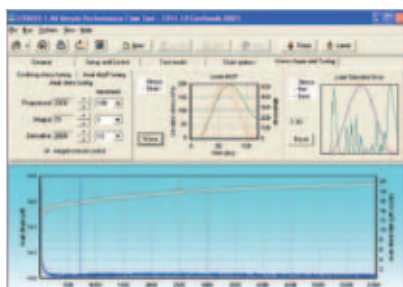
Purpose-written test applications

Benefit from more than 20 years of IPC Global's expert software application development. With UTS test applications written around international standards you can concentrate on analysing your materials; not on programming your testing machine.



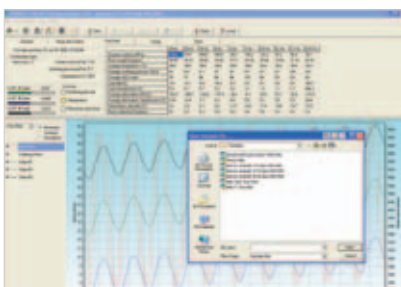
All test data saved in portable binary files

A powerful feature unique to UTS software. When the test is finished UTS saves in a binary file the results, the data points but also every one of the test setup parameters and calibration parameters. This means that at any time in the future the test can be reviewed as if it has just been performed complete with all test control, PID, specimen settings and results.



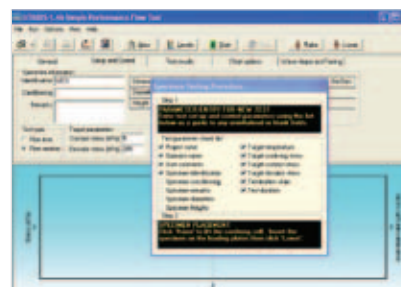
The ultimate in clean accurate data

IMACS integrated control and data acquisition with 4x oversampling technology, auto-ranging and effective 20 bit data resolution gives unparalleled control and waveform fidelity.



Test templates

Specific test settings can be entered and saved by the Chief Engineer or Laboratory Manager for easy recall and testing by laboratory technicians. There is no need to configure the machine each time you want to perform a specific test.



Automated Test Routines

Easy to follow tool tips built into UTS guides users with simple and clear step by step instructions for running pre-programmed tests. Ensuring that all required parameters are set and are able to be turned off by more advanced users.

Control & Data Acquisition

Controlling AMPT is IPC Global's Integrated Multi-Axis Control System (IMACS). IMACS delivers leading edge performance, unparalleled control and the ultimate in flexible data acquisition†.

- Low data noise performance with over-sampled data
- Excellent waveform fidelity from the integrated acquisition and control functions
- Flash based firmware allows field updates of all modules
- Total confidence in measurements from analogue inputs that auto-calibrate on power-up
- Acquisition and Control—2 axis control (actuator and confining pressure), up to 8 channel data-acquisition (actuator displacement, axial load, 3 to 4 on-specimen displacement transducers, confining pressure and temperature)

† See White paper 'Ensure Reliable Results: The Case For Robust Control & Data Acquisition'. Contact sales@ipcglobal.com.au for your copy.



AMPT Specifications

AMPT

Load Capacity	Static: 15 kN Dynamic: 13.5kN
Frequency Range	0.01 to 60Hz sinusoidal loading
Actuator Stroke	30mm (+/-15mm stroke)
Actuator Type	Labyrinth Bearing
Specimen Size	100mm (dia) x 150mm (H) nominally
Temperature	+4° to +60°C at +/-0.5°C*
* When Ambient Temperature is between +15°C to +27°C.	
Cell Dimensions	270mm (dia) x 390mm (H)
Confining Pressure	0 to 225kPa
Noise Level	Less than 70db at 2m
Dimensions	1330mm (H) x 630mm (D) x 1100mm (W)
Weight	250kg (excluding oil)

Services

Power	208V–230V 50Hz/60Hz single phase, 15A
Air	Clean dry air at 450 to 800kPa; 2 L/sec
Hydraulic Oil	28ltr ISO 46 Premium Mineral Oil

Transducers

Load Cell	Low profile pancake type 15kN capacity
Built-in Actuator LVDT	30mm Stroke
On-Specimen Displacement Transducers	3 clip on +/-0.5mm LVDTs
Integrated Pressure Transducer:	35kPa–225kPa
Integrated Temperature Transducer:	0°C to +60°C

Test Standards

NCHRP 9-19
NCHRP 9-29
AASHTO TP79

Optional Accessories

Indirect Tensile Dynamic Modulus	AASHTO
Overlay Test	ASTM
Uniaxial Fatigue	SCDUF Simplified Continuum Damage Uniaxial Fatigue S-VECD Simplified Viscoelastic Continuum Damage
Dynamic Modulus	AASHTO TP62

Control & Data Acquisition—IMACS

Configuration	Fully integrated
Real Time Digital Computer Control	32bit Processing
Acquisition Speeds	5kHz (simultaneous on all channels)
Data Over-Sampling	At least 4x
Data Resolution	20 bit auto-ranging data acquisition
Communication	USB 2.0: 12Mb/s Ethernet: 10/100Mb/s
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 acquisition (actuator displacement, axial load, 3 to 4 on-specimen displacement transducers, confining pressure and temperature)



IPC Global Customer Care

At IPC Global we are proud of our products.

We're dedicated to supplying high quality, accurate, affordable, easy-to-use systems for advanced testing of asphalt, soil, unbound granular and other construction materials.

As a valued customer of IPC Global you will receive continuous, expert support and advice for your instrument. Furthermore, we ensure new users are trained in the correct operation of your IPC Global equipment.

For support from our expert customer care team, contact your local IPC Global distributor or IPC Global directly on +61 3 9800 2200 or email techsupport@ipcglobal.com.au.

Visit our website for more information:
www.ipcglobal.com.au

Above: Clip-on strain transducer mounts and spring-loaded displacement transducers

Disclaimer:

The design and specifications of any IPC Global product may be subject to change without notice.

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The science of testing **made easy**®

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