

ASPHALTOUBE | ASPHALTOUBE PRO

Modular Electromechanical
Servoactuation Asphalt Mix Testers



Pioneering Asphalt Mix Testing

Standalone Dynamic Testing

AsphaltQube and AsphaltQube Pro are the new modular Electromechanical Servoactuation Asphalt Mix Testers from IPC Global.

Standalone and compact, both models feature a range of new technologies including the innovative Electromechanical Servoactuation (EmS) Actuator that can deliver up to 15kN force (AsphaltQube) and 30kN (AsphaltQube PRO) with no need for a Hydraulic Power Supply.

The AsphaltQubes' small footprint, combined with the ability to perform most QA / QC and Research tests, make them the perfect solution for both static and mobile testing.



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AsphaltQube and AsphaltQube PRO at a glance

ONE

One Single Machine

purpose-built for dynamic testing of asphalt to perform the most common QA / QC and Research performance tests.



Small Footprint

for any laboratory, office, classroom or mobile facility with optional integrated compressor for Triaxial Cell.

EmS

Electromechanical Technology

using a high pre-load ball-screw that delivers up to 15kN (AsphaltQube) and 30kN (AsphaltQube PRO) backlash free force with minimal noise.



Fully integrated

and improved dynamic performance compared to servo-pneumatic systems.



Easy installation

with no HPS, water cooling or laboratory compressed air required.



Exceptional Cooling Performance

with advanced integrated water-cooled thermoelectric refrigeration.



Smart Electromechanical Servoactuation Technology (EmS)

Our radical new approach gives access to the most common QA / QC and Research asphalt mixture performance tests that were previously only available to high-end research laboratories.

The AsphaltQubes benefit from IPC Global's revolutionary new EmS technology using a high pre-load ball-screw that delivers backlash free force with minimal noise.

EmS technology is environmentally-friendly with clean operation, requiring no hydraulic power supply. It offers excellent reliability, accurate testing, lower maintenance and is more economical compared to Servo- hydraulic and Servo- pneumatic testing solutions. The innovative design ensures it can be quickly and easily maintained only requiring lubrication Cycles every 500 hours.

The EmS technologies are housed in a robust frame only occupying a small laboratory footprint. This and the heavy duty casters, adjustable feet plus the limited power supply required make the AsphaltQubes the ideal solution for both static and mobile laboratories.

EmS

**Easy, quick, versatile
and low maintenance**

- Environmentally-friendly
- Silent and clean operation with no bulky HPS or associated noise
- No compressed air or hydraulic power supply
- Easy maintenance only requiring machine lubrication cycles every 500 hours
- Unparalleled value

ASPHALTQUBE

Smart, Compact and Versatile

User-friendly Environmental Chambers

High performance thermoelectric temperature control and environmental chamber design allows easy access for test set-up and testing temperatures with a range up to -10°C .

Easy and Versatile

Easily interchangeable test fixtures, transducers and load cells complying to international test standards for quick and easy transition of test set-ups.



The lockable side drawer and interchangeable transducers are unique to IPC Global. Eight BNC connectors provide raw analogue outputs from the signal conditioners to permit the use of external data logging equipment.

180° Access for easily change test set-ups and load specimens.



All-in-One Computer Control

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

Optional — integrated Silent Air Compressor

Eliminates the need for an external air compressor.

Clarity in Results

Controlling AsphaltQube is IPC Global's Integrated Multi-Axis Control System (IMACS2) delivering unparalleled performance, control and flexible data acquisition.

Advanced Thermoelectric Refrigeration with two systems available as accessory:

Advanced Water-cooled with integrated water-chiller delivering temperature control from -10°C to $+60^{\circ}\text{C}$; **Standard** an-cooled for temperatures between $+2^{\circ}\text{C}$ and $+60^{\circ}\text{C}$.



ALMOST ZERO MAINTENANCE

AsphaltQube uses long life thermoelectric cooling and heating for high performance and reliability, with no refrigerant gases required. The solid state construction of Peltier Devices provides exceptional cooling and heating performance using innovative pulse width modulation.

With no moving parts, Peltier Thermoelectric Modules are virtually maintenance-free and have typical life span greater than 200,000 hours.

ASPHALTQUBE PRO

Truly Universal and Powerful

Designed around the third generation Integrated Multi-Axis Control System (IMACS2) controller, AsphaltQube PRO EmS is a welcome addition to the current IPC Global range of modular testing systems.

The new 30kN capacity dynamic electromechanical actuator benefits from the can perform an infinite range of both Quality Control and Research tests, or new materials' development tests.



Exceptional Cooling Performance

with possibility to perform thermal cracking tests.



Optional — integrated Silent Air Compressor

Compressed air supplied via an optional integrated compressor available as an accessory.



NEW Cabinets

The new modular temperature-controlled cabinet is available with a range of -40°C to +80°C. An adjustable temperature sensor, located near the specimen always maintains an accurate temperature. You can fix or ramp temperatures with our intuitive UTS Neutron software.

NEW 30kN EmS Actuator

The new actuator uses a high pre-load ball screw that delivers 30kN backlash-free dynamic force over 100mm travel, with minimum noise.

Powered with EmS technology, the new actuator requires no hydraulic power supply keeping your laboratory clean.

Adjustable Reaction Frame

Our UTS Neutron software or the front joystick control the motorized reaction frame and make it a breeze to adjust the vertical daylight according to the test configuration.

The reaction frame is built from solid steel that increases mechanical stiffness, improving vertical load alignment.

Easy to Set-up and Control

All test transducers, confinement pressure line and Four-Point bend jig clamping motors can connect directly to the rack inside the temperature-controlled cabinet. Controlling the AsphaltQube Pro is IPC Global's IMACS2, delivering unparalleled control especially when used with our UTS Neutron software suite.

ASPHALTQUBE

ASPHALTQUBE PRO

Stiffness / Dynamic Modulus Tests	✓	✓
Permanent Deformation Tests	✓	✓
Fatigue Tests	✓	✓
Cracking / Overlay Tests	✓	✓
Thermal Cracking Tests	✗	✓
Tests on Unbound Materials	✗	✓
Tests exceeding Standard Specifications	✗	✓

Integrated Data Acquisition and Analysis

IMACS2 and UTS NEUTRON



IMACS2 Control and Data Acquisition

IPC Global's 3rd Generation Multi-Axis Control System IMACS2 is built into our range of AsphaltQube testers 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.

AsphaltQube testers feature two control axis and up to 8 channels of data acquisition. The Control & Data Acquisition system can be customized in accordance to your individual testing requirements.

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).



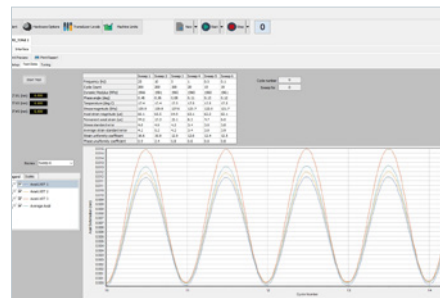
UTS Neutron - Dynamic Materials Testing and Analysis Software

AsphaltQube testers are supplied complete with new UTS Neutron, the most advanced materials testing and analysis software for performance, accuracy and flexibility.

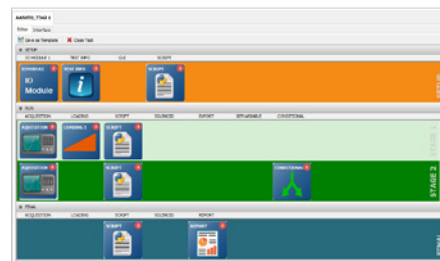
UTS NEUTRON

- 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.

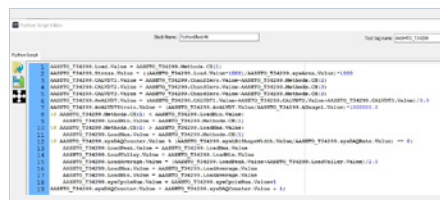
Three Licence Levels



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



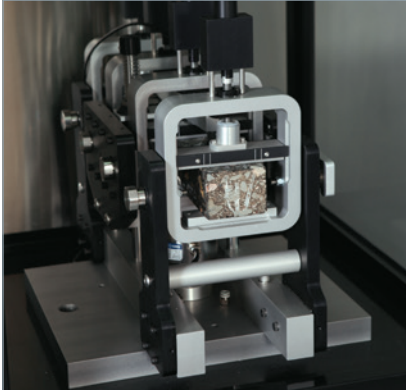
PERFORMANCE for those wanting to make changes to existing tests using graphical block programming.



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

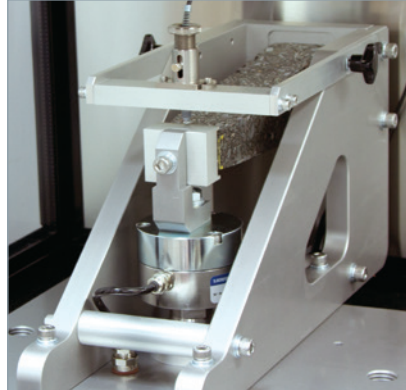
Widest Range of Accessories

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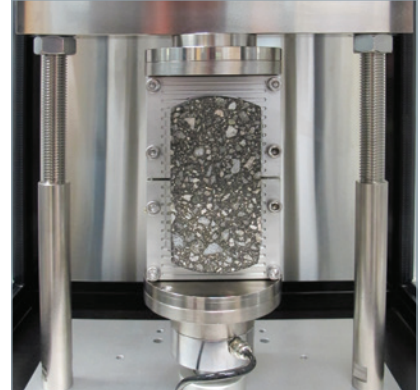
Four Point Bend

- AASHTO T321 – Fatigue (Formerly TP8)
- AG/PT/T274-15 – Fatigue (Formerly AG/PT/T233, AST 03:2000)
- ASTM D7460 /D8237 – Flexural Fatigue
- EN 12697-24D – Resistance to Fatigue
- EN 12697-26B – Stiffness



Two Point Bend Trapezoidal

- EN 12697-24A – Fatigue
- EN 12697-26A – Stiffness/ Complex Modulus



Overlay

- ASTM WK 26816 – Reflective Cracking Test
- TxDOT Designation: Tex-248-F – Overlay Test



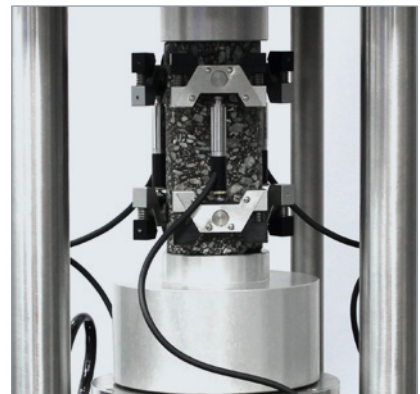
Dynamic Modulus E*

- AASHTO T342/TP62 – Dynamic Modulus
- AASHTO T378/TP79 – Dynamic Modulus E*, Flow Number, Flow Time



Uniaxial Fatigue – Unconfined

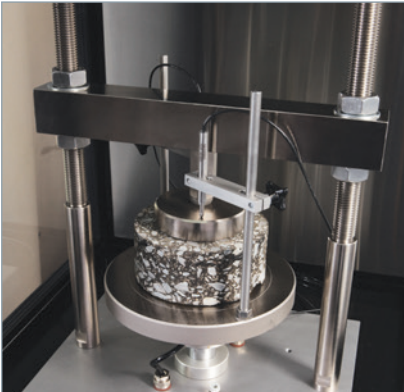
- AASHTO T400/TP107 (S-VECD)
- EN 12697-26D (DTC-CY) – Direct Tension-Compression
- EN 12697-26E (DT-CY) – Direct Tension Complex Modulus
- SCDUF – Simplified Continuum Damage Uniaxial Fatigue



Small Diameter

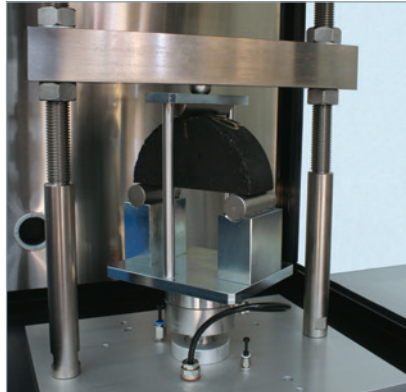
- AASHTO TP132 - Dynamic Modulus E*
- AASHTO TP133 - Uniaxial Fatigue (S-VECD)

IPC Global works closely with the Asphalt Research Community to develop new test Standards and accessories to help you perform all the most common Asphalt Mix Tests with ease.



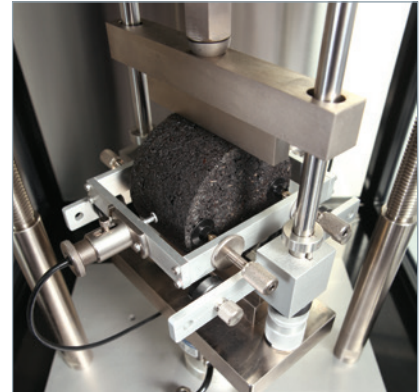
Compression

- AS 2891.12 – Permanent Deformation (Creep)
- BS 598-111 – Permanent Deformation (Creep)
- EN 12697-25A – Cyclic Compression



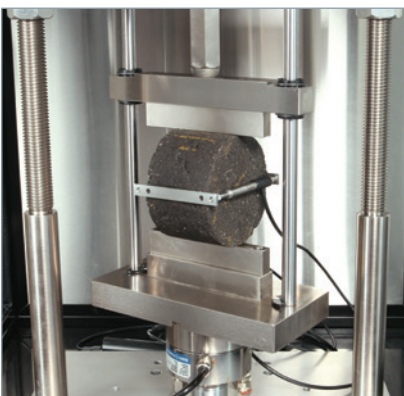
Semi Circular Bend (SCB)

- AASHTO T393/TP124 (I-FIT) – Fracture Potential of Asphalt Mixtures Using the Flexibility Index Test (FIT)
- ASTM D8044 (LSU SCB) – SCB Cracking Resistance Test at Intermediate Temperature
- EN 12697-44 – Crack Propagation by Semi-Circular Bending Test



Indirect Tensile

- AASHTO TP31 – Resilient Modulus
- AS 2891.13.1 – Resilient Modulus
- ASTM D4123 – Resilient Modulus
- EN 12697-26C (IT-CY) – Stiffness



Indirect Tensile

- EN 12697-24E – Fatigue



Indirect Tensile

- AASHTO T322 (TP9) – Creep Compliance
- ASTM D7369 (NCHRP 1-28A) – Resilient Modulus



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ONLY

Triaxial Cell – 100mm specimens

- Triaxial Cell – 100mm specimens
- EN 12697-25B – Permanent Deformation
- AASHTO T378 – Dynamic Modulus

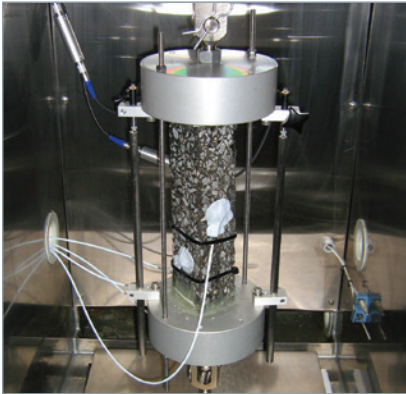
Widest Range of Accessories

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Triaxial Cell – 150 and 100mm specimens

- EN 12697-25B – Permanent Deformation
- AASHTO T378 – Dynamic Modulus
- AASHTO T342 – Dynamic Modulus
- AASHTO T307 – Resilient Modulus on Unbound Granular Materials



TSRST Test

- AASHTO TP10 – TSRST
- EN 12697-46 – Low temperature cracking



DCT Test

- ASTM D7313 – Disk-shaped Compact Tension test

System Specifications

	ASPHALTQUBE	ASPHALTQUBE PRO
Load Capacity	Static: 10kN < 0.1Hz / Dynamic: 15kN ≥ 0.1Hz	Static: 25kN < 0.1Hz / Dynamic: 30kN ≥ 0.1Hz
Load Cell	+/- 20kN low profile pancake type	+/- 30kN low profile pancake type
Actuator Stroke	30mm (+/-15mm stroke)	100mm (+/-50mm stroke)
Actuator Type	Electromechanical Servoactuation (EmS)	Electromechanical Servoactuation (EmS)
Weight with Chamber	250kg (with no accessories)	400kg (with no accessories)
Dimensions with Chamber	1,630 x 830 x 830mm (H x W x D)	2,060 x 820 x 1,320mm (H x W x D)
Plug-and-Play	Up to five interchangeable on-specimen displacement transducers, plus easily interchangeable load cells	Up to six interchangeable on-specimen displacement transducers, plus easily interchangeable load cells

NOTE: All tests limited to the force and temperature range of the equipment.

System Specifications

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Environmental Chamber

Temperature Range	Standard range +2 to +60°C* Extended range -10 to +60°C*	Standard range -40 to +80°C*
Temperature Accuracy	+/-0.5°C**	+/-0.5°C**
Noise Level	Less than 70db at 2m	Less than 70db at 2m
Air Compressor and Dryer	Low noise, integrated, automated operate-on-demand (optional)	Low noise, integrated, automated operate-on-demand (optional)
Dimensions	690 x 832 x 720mm (HxWxD)	1,160 x 820 x 430mm (HxWxD)
Weight	30kg	120kg

Services

Power (without air compressor)	230V, 50Hz, single phase, 9A 110V, 60Hz, single phase, 18A	380V, 50Hz, triphase, 14A 220V, 60Hz, triphase, 28A
Power (with air compressor)	230V, 50Hz, single phase, 11A 110V, 60Hz, single phase, 22A	380V, 50Hz, triphase, 16A 220V, 60Hz, triphase, 30A
Additional Power with Standard Range Chamber	+2A @230V / +4A @110V	+11A @230V / +22A @110V
Additional Power with Extended Range Chamber	+5A @230V / +10A @110V	N/A
Air	Clean dry air at 450-800kPa; 2 L / sec (Optional integrated Air Compressor available)	Clean dry air at 450-800kPa; 2 L / sec (Optional integrated Air Compressor available)

System Options

- AsphaltQube & AsphaltQube Pro Environmental Chambers (optional, to be included with any machine)
- Reaction Frame kit (AsphaltQube only)
- All-in-One Touchscreen PC (optional)
- Air compressor and dryer – Low noise, integrated, automated operate-on-demand (optional)
- Confinement pressure automatic control, if Triaxial Cell is used (optional)

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, 1x 10/100Mb Ethernet

Firmware Update: Flash based
Analogue Inputs: Auto-calibrate on power up
Analogue Outputs: 8 BNC connectors for raw data logging
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)

* In an ambient condition of 23°C.

**At temperature probe positioned close to the specimen.

IPC Global Customer Care

IPC Global is the Advanced Pavement Testing Division of CONTROLS. As one of the longest established manufacturing companies in the world of Construction Materials Testing solutions, we are dedicated to supplying high quality, accurate, affordable, easy to use systems.

As a valued customer of CONTROLS, you will receive continuous, expert support and advice for your IPC Global equipment. Furthermore, we can offer full installation and training in the correct operation of your equipment.

For support from our expert Customer Care Team, contact your local CONTROLS office / distributor or email customercare@controls-group.com.

For more information, please visit www.controls-group.com.

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