



BUYER'S GUIDE

Asphalt Laboratory Apparatus

NZTA M10, NZTA M32, NZTA M27, NZTA P11, AGPT04B, MS-2, AASHTO M323

Introduction

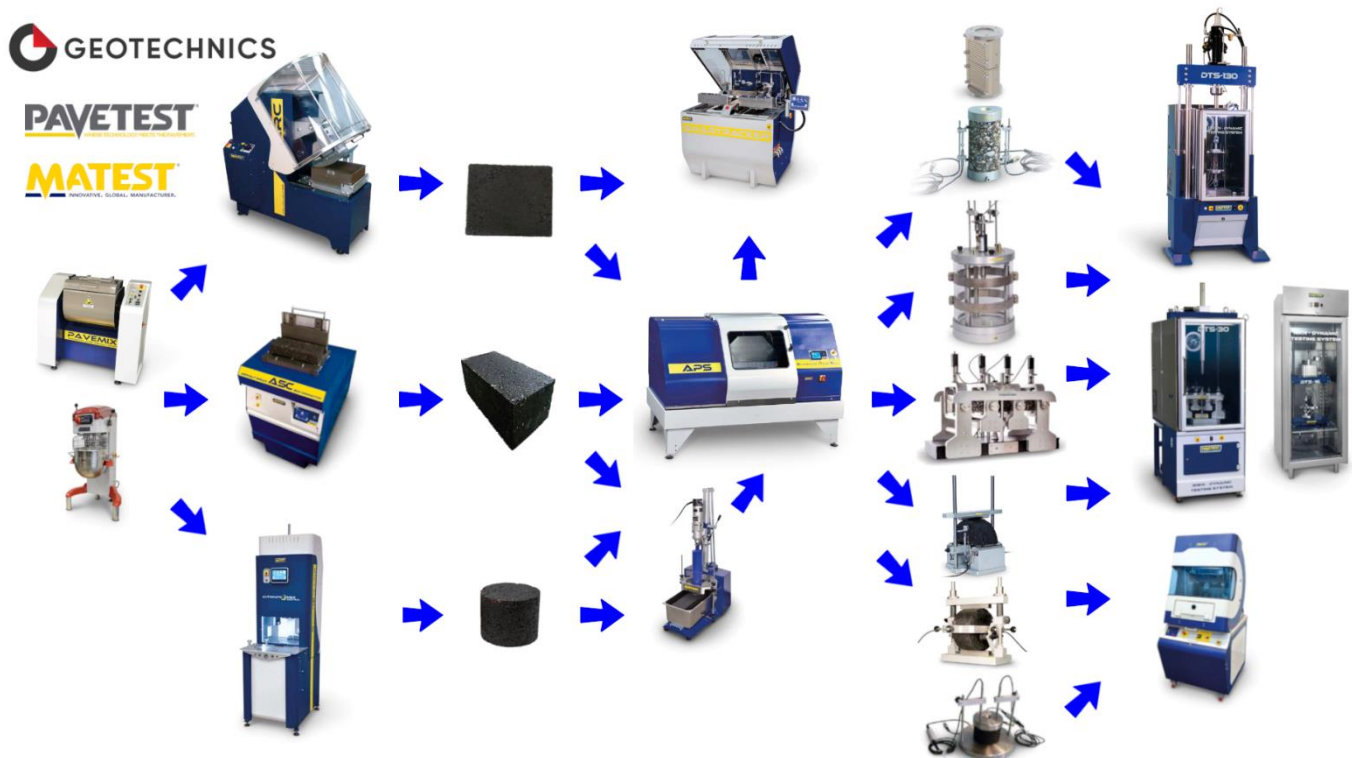
Welcome to our asphalt laboratory testing apparatus buyer's guide. This guide is meant to be used as a convenient all in one overview of the testing systems needed for the most common test methods used in New Zealand.

The quantities suggested for accessories and consumables are an indicative only, we highly recommend to get in touch with us for a technical consultation so we can handcraft a system configuration ideally suited to your requirements.

For some test methods there will be multiple options to chose for a certain test that will vary in degree of sophistication and automation. Please refer to the Standard or Specification references under the titles for each test system.

The guide will focus first on the volumetric and empirical test systems and then move on to the performance-based test systems, thus covering the full range of asphalt tests required for various mix design specifications. Aggregate and binder test systems are not covered in this guide.

Performance-based test methods are typically requiring equipment for sample mixing, compacting, cutting and finally dynamic test systems for determination of asphalt modulus, fatigue and other characteristics. The diagram below illustrates how it all connects together.



A full range of aftersales services is available for all of the test systems in this guide, ranging from installation and user training, to IANZ endorsed calibrations, regular servicing and technical support.

1. Binder Content Determination

Quantitative Extraction of Bitumen from Bituminous Paving Mixtures

ASTM D2172, AASHTO T164



Product code	Description	Quantity
B011-01	Centrifuge extractor explosion proof 1500/3000 g, 230V 50Hz 1ph	1
B010-12	Bowl and cover 3000 g capacity	1
B010-16	Filter discs for centrifuge 3000 g capacity, pack of 100	3
A008-03	Laboratory oven, forced ventilation, 220 litres, 230V 50Hz 1ph	1
H-4351.6	Aluminium rectangular mixing pan 654 x 450 x 89 mm	1
H-3760	Forged steel trowel with flat blade and rubber handle, 70 x 127 mm	1
SDALE15001R	ALE series ViBRA precision balance 1500 g x 0.1 g	1
SDHTN220	HT series ViBRA analytical balance 220 g x 0.1 mg	1
V200-05N	Rectangular hot plate 400 x 500 mm, 2000 W, 230V 50Hz 1ph	1
139.223.05	Premium glass measuring cylinder 100 ml	1
139.223.08	Premium glass measuring cylinder 1000 ml	1
139.223.09	Premium glass measuring cylinder 2000 ml	1
H-4930.250	Porcelain evaporating dish 250 ml capacity, 115 mm x 45 mm	1
1351-210	Desiccator 210 mm dia. with porcelain plate 185 mm dia.	1
L30-1KG	Silica gel self-indicating, 1 kg	1
TPE-RFC	TPE stainless steel fume cupboard	1
229.202.10	Premium low form glass beaker 1000 ml	1
130.202.08	Premium glass volumetric flask, Class A, 500 ml	1
130.202.09	Premium glass volumetric flask, Class A, 1000 ml	1
PJ100	Premium graduated plastic jug 1000 ml	1



Quantitative Extraction of Binder from Asphalt Mixes

NZTA T22



Product code	Description	Quantity
75007211	Megafuge 8 Small Benchtop Centrifuge, 230V 50Hz	1
75005701	TX-150 Swinging Bucket Rotor	1
75005702	Round Buckets for TX-150 Swinging Bucket Rotor (Pack of 4)	1
75005707	ClickSeal Biocontainment Lids for Round Buckets for TX-150 (Pack of 4)	1
75005735	100 mL Round Bottom Adapters for TX-150 (set of 4)	1
THR75007542	Adapter holds 1 x 50mL DIN tube. Compatible with swing-out rotor	4
3114-0050	Nalgene Oak Ridge High-Speed Centrifuge Tubes 50 mL (Case of 10)	1
G11.1	Cleanness value container 200mm dia x 200mm high	1
A008-03	Laboratory oven, forced ventilation, 220 litres, 230V 50Hz 1ph	1
SDALE15001R	ALE series ViBRA precision balance 1500 g x 0.1 g	1
TPE-RFC	TPE stainless steel fume cupboard	1
SDHTN220	HT series ViBRA analytical balance 220 g x 0.1 mg	1
V200-05N	Rectangular hot plate 400 x 500 mm, 2000 W, 230V 50Hz 1ph	1
200SIW.150	200mm dia. x 150mic S/S Woven Wire ISO Sieve	1
200SIW.075	200mm dia. x 75mic S/S Woven Wire ISO Sieve	1
G75.T22	Brass evaporation dish with lid 45 x 70mm	6
H-4351.2	Aluminium rectangular mixing pan 390 x 276 x 60 mm	1
V192	Flexible stainless steel spatula 100 mm	1
V147	Stirring rods, made of glass, Ø 8x250 mm long. Pack of 10.	1



Automated Extraction of Asphalt Binder from Asphalt Mixtures

EN 12697-1, ASTM D8159



Product code	Description	Quantity
B003	AMA - Asphalt Mix Analyzer, automatic closed-loop system, 380V 50Hz 3Ph	1
B003-13N	Worktop integrated balance for the bitumen content 10 kg x 0.1 g	1
B003-04	Washing drum, opening 0.075 mm	3
B003-06	Closing lid for washing drums	3
B003-07	Centrifuge cup Ø120 mm x 200 mm height	2
B003-17	Centrifuge cup extraction device	1
B008-11	Lining paper for centrifuge cup, pack of 100	2
B003-14	Solvent stabilizator	1
B003-15	Solvent pumping device	1
<i>Optional:</i>		
B003-18	Fast connection for rotary evaporator flask	1
B065-01	Rotary evaporation apparatus, motorized, 230V 50Hz 1ph	1
B065-12	Vacuum regulating system	1
B065-14N	Diathermic oil, can of 18 kg	1
B065-15	Evaporation balloon, made of glass, flat, 3 l capacity	1
B065-16	Flow control device with flowmeter to ASTM D5404	1
B021	Solvent recovery still - 10 Litre/Hour, 230V 50Hz 1ph	1



Asphalt Content of Hot-Mix Asphalt by Ignition Method

ASTM D6307, AASHTO T308



Product code	Description	Quantity
B005N	Bitumen content furnace by ignition method, 400V 3ph 50Hz 8500W	1
B005-10N	Metal Stand to hold the Bitumen Content Furnace	1

Initial weight		
Tray weight:	3476,0	g
Tray weight + sample:	4983,3	g
Sample start weight:	1507,3	g
Final weight		
Tray weight + sample:	4895,6	g
Sample end weight:	1419,6	g

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2. Specific Gravity and Density Determination

Bulk Specific Gravity and Density of Compacted Asphalt Mixtures

ASTM D2726, AASHTO T166, AASHTO T275, AS/NZS 2891.9.1, AS/NZS 2891.9.2, AS/NZS 2891.9.3



Product code	Description	Quantity
H-2710A.1	Deluxe specific gravity bench, 787 x 635 x 1168 mm	1
H-2712A.1	Water tank 98.4 L with overflow and drain fittings	1
H-3371	Specific gravity basket, stainless steel No. 8 wire mesh, 8" x 8" dia.	1
H-2715	Hollow tube specific gravity cradle, stainless steel	1
SGHCK	Heater circulator kit, mounting plate included, 230V 50Hz	1
<i>Alternative model:</i>		
H-2988A.4F	Immersion circulator and heater with large LCD screen and clamp, 220V 50Hz	1
SDHJ33KSR	HJK series ViBRA IP65 precision balance 400 x 350 mm, 33 kg x 0.1 g	1
RD5806	HJK under weighing hook	1
A008-03	Laboratory oven, forced ventilation, 220 litres, 230V 50Hz 1ph	1
PM/996	Parafilm M – Laboratory Film 4 inch x 125 ft	1
200SIS4.75	200mm dia. X 4.75mm S/S Perforated Plate ISO Sieve	1
200SIW2.36	200mm dia. X 2.36mm S/S Woven Wire ISO Sieve	1
1464917	Traceable™ Four-Channel Countdown Alarm Digital Timer/Stopwatch	1
44/820/0	LO-tox glass thermometer, 405 mm -1 to +51 °C – 0.1 °C 76 mm Immersion	1



Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures

ASTM D2041, AASHTO T209, AS/NZS 2891.7.1



Product code	Description	Quantity
H-1756.3F	Vibrating de-airing agitator table for vacuum pycnometers 220V 50Hz	1
H-1750	Vacuum Pycnometer Set, (4.34L) for Rice test (TMSG)	1
<i>Optional upgrade for automatic shut off at the end of test:</i>		
H-4296A.4F	Humboldt Digital Timer, Minutes, 220V 50/60Hz	1
H-1754D.4F	Digital Manometer, 0 to 1000mm Hg (absolute), 220V 50Hz	1
H-1759	Drierite Air Drying Unit complete with 650G of Indicating Desiccant	1
H-1758	Indicating Drierite Desiccant, 1lb/8 mesh	1
RVD70KIT	Dry Piston Vacuum Pump Kit, with ¼" manifold with needle (flow control) valve, -100/0 kPa vacuum gauge and single 6mm outlet. 200 W, 230V, 50 Hz	1
VACHOSE	6mm I.D. silicone hose, 1 meter length for RVD70KIT	3
PP-2015	Rice Sample Preparation Pack Consists of an aluminium tray 45 x 66 x 2.5 cm deep and 25 sheets of Lablease silicone-coated release paper	1
PP-2020	40 x 60 cm Sheets of LabLease Paper, Pack of 25	2
<i>Alternative/optional models for improved and fully automatic performance:</i>		
AUTORICE	AutoRice™ automatic control unit for Rice test (<i>replaces H-1754D.4F</i>)	1
PUMPSAVER	PumpSaver™ electronic moisture trap for vacuum pump (<i>replaces H-1759/8</i>)	1
B007	Asphalt Splitter, to break and crumble asphalt sample for TMSG, 230V 50Hz	1



3. Preparing and Compacting of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor

Hot Mix Asphalt Sample Preparation

AASHTO T312, ASTM D6925, AS/NZS 2891.2.1

Product code	Description	QTY	
HA-1600	HMA's Split-Master Quartering Hand Tool	1	
H-4122	Asphalt Mix Sample Splitter (QuarterMaster)	1	
H-4122QF	QuarterMaster Quick Funnel Insert	1	
H-3760	Forged steel trowel w/ flat blade, rubber handle	1	
HA-3115	HMA's Super-Scoop, stainless 21.5 x 10 x 7.6 cm	1	
HA-3205	Large Batch Weighing Scoop 52 x 38 x 14 cm	1	
HA-3200	The 'Wolverine' Batch Weighing Scoop 43 x 30 x 12.7 cm, holds 4500 grams	1	
H-1702	Gyro Moulds Filling Scoop 203 x 381 x 584 mm	1	
SDHJ22KSR	HJK series ViBRA IP65 precision balance 400 x 350 mm, 22 kg x 0.1 g	1	
A008-05	Laboratory oven, forced ventilation, 440 litres Temperature from ambient to 200 °C Inside dimensions: 900x700x700 mm 230V 50Hz 1ph	1	
SHELFSUP	Lower shelf support to handle extra weight	1	
ITH-C300	Center 300 Type K Handheld Thermometer, Range: -200/1370°C, Accuracy: ±0.3% rdg + 1°C	1	
ITP-KT08_4	8 x 400 mm Type K T-Handle Bitumen Probe	1	
B025-01N	Laboratory Planetary Mixer 20 litres 400V 3ph 50Hz 732W	1	
B025-14N	Stainless steel beater	1	
B025-16N	Hook Beater for B025-01N	1	

Hot Mix Asphalt Sample Compaction

AASHTO T312, ASTM D6925, AS/NZS 2891.2.2



Product code	Description	Quantity
B045	Gyromec - electromechanical gyratory compactor 230V 50Hz 1ph	1
B041-20	Integrated Worktop for B045, to house automatic sample extruder	1
<i>Alternative model with automatic angle selection and shear stress data:</i>		
B045-01	GyroResearch - electromechanical gyratory compactor 230V 50Hz 1ph	1
B041-19	Integrated Worktop for B045-01, to house automatic sample extruder	1
B045-23	Automatic electromechanical specimen extruder	1
B041-21	Wheels (kit of 4) with brake, for easy displacement of the compactor	1
B041-11	Top penetration piston Ø 100 mm	1
B041-12	Top penetration piston Ø 150 mm	1
B041-05	Hardened cylinder mould Ø 100 mm complete with bottom plate	6
B041-06	Hardened cylinder mould Ø 150 mm complete with bottom plate	6
B041-13	Metallic discs for Ø 100 mm moulds. Pack of 2	6
B041-14	Metallic discs for Ø 150 mm moulds. Pack of 2	6
B041-15	Filter paper discs 100 mm dia (pack of 100)	2
B041-16	Filter paper discs 150 mm dia (pack of 100)	2
B041-28	GAM - Gyratory Angle Measurer	1
B041-33	Kit of 2 distance pieces for vertical verification	1
B041-31	Vertical force testing device with digital dynamometer	1
MIT3PBM	Mitutoyo 150 mm three point bore micrometer kit with IANZ calibration	1



4. Marshall Method of Mix Design

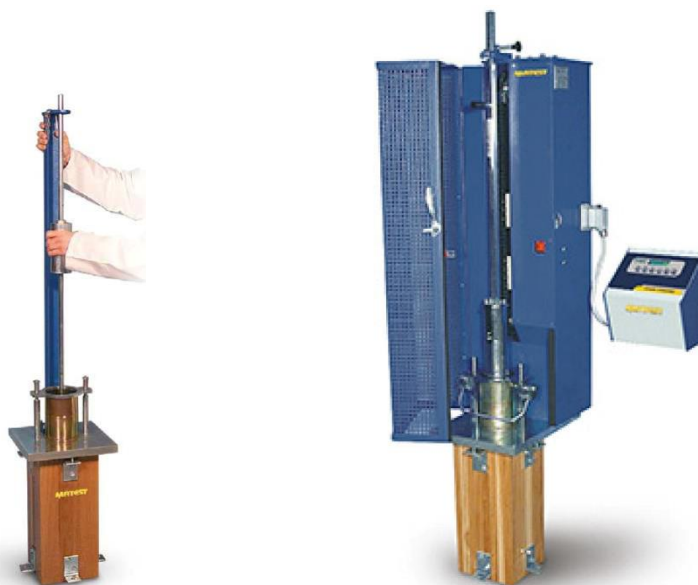
Preparation of Bituminous Specimens Using Marshall Apparatus

ASTM D6926

Product code	Description	QTY	
HA-1600	HMA's Split-Master Quartering Hand Tool	1	 
H-4122	<i>Alternative model for larger volumes:</i> Asphalt Mix Sample Splitter (QuarterMaster)	1	
H-4122QF	QuarterMaster Quick Funnel Insert	1	
H-3760	Forged steel trowel w/ flat blade, rubber handle	1	 
H-4974	Stainless steel spoon 330 mm long	1	
HA-3205	Large Batch Weighing Scoop 52 x 38 x 14 cm	1	 
HA-3200	The 'Wolverine' Batch Weighing Scoop 43 x 30 x 12.7 cm, holds 4500 grams	1	
V184-02	Round aluminium scoop, 1550 ml capacity	1	  
H-4906	Flexible S/S spatula 25.4 x 152.4 mm long	1	
SDALE1500 1R	ALE series ViBRA precision balance 160 x 180 mm, 1500 g x 0.1 g	1	
A008-05	Laboratory oven, forced ventilation, 440 litres Temperature from ambient to 200 °C Inside dimensions: 900x700x700 mm 230V 50Hz 1ph	1	  
SHELFSUP	Lower shelf support to handle extra weight	1	
ITH-C300	Center 300 Type K Handheld Thermometer, Range: -200/1370°C, Accuracy: ±0.3% rdg + 1°C	1	
ITP-KT08_4	8 x 400 mm Type K T-Handle Bitumen Probe	1	
B025-01N	Laboratory Planetary Mixer 20 litres 400V 3ph 50Hz 732W	1	  
B025-14N	Stainless steel beater	1	
B025-16N	Hook Beater for B025-01N	1	

Preparation of Bituminous Specimens Using Marshall Apparatus

ASTM D6926



Product code	Description	Quantity
B032-KIT	Marshall ASTM Hand Compactor for Moulds Dia. 4" Consists of: Compaction hammer, pedestal, support and hammer guide	1
B033-01N	<i>Alternative automatic model with a safety switch:</i> Automatic Marshall ASTM Compactor for Moulds Ø 4", with safety guards 230V 50Hz 1ph 300W	1
B033-04	Steel plate 100x50 mm to heat the compaction hammer	1
B033-03	Soundproof security cabinet CE (<i>optional</i>)	1
B030-KIT	Marshall compaction mould, ASTM Ø 4" Consists of: Mould body, filling collar and base plate	6
B030-05	Filter paper discs for Ø 100 mm moulds, pack of 100	2
B052	Digital Water Bath 60 Litres Capacity, 230V 1ph 50Hz 1500W	1
H-1331B	4" dia. x 4.5" tall metal can with lid for storing Marshall mix samples	3
B030-03	Extraction plate, to eject specimens from the mould	1
B030-04	Specimen receiver, used to receive specimens ejected by B030-03	1
S114	<i>Alternative model for improved ease of use:</i> Universal Hydraulic Extruder 50 kN (<i>replaces B030-03 + B030-04</i>)	1

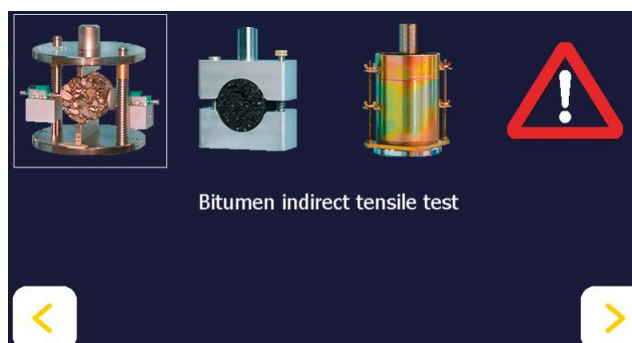


Marshall Stability, Flow and Effect of Moisture (TSR) of Bituminous Mixtures

ASTM D6927, ASTM D4867, ATM T232



Product code	Description	Quantity
S215A	Universal multispeed load frame, 50 kN digital measurement, 230V 1ph 50Hz Includes: Universal load frame with touch screen, 8-channel data processing system, 50 kN load cell, linear displacement transducer 50 mm travel with a mounting device.	1
B046-03	Stability steel mould Ø 4" to ASTM D6927	1
S212-05	Marshall load piston	1
	<i>Optional PC software:</i>	
B043-01N	SOFTWARE UTM2, Licence for MARSHALL test	1
B047-02S	Indirect tensile splitting device, complete with loading bars for 100 mm and 150 mm samples	1
	<i>Optional PC software:</i>	
B043-02N	SOFTWARE UTM2, Licence for INDIRECT TENSILE STRENGTH test	1



5. Performance-Related Properties

Sample Preparation - Compaction of Asphalt Slabs

AGPT-T220, ASTM D8079, ASTM D7981

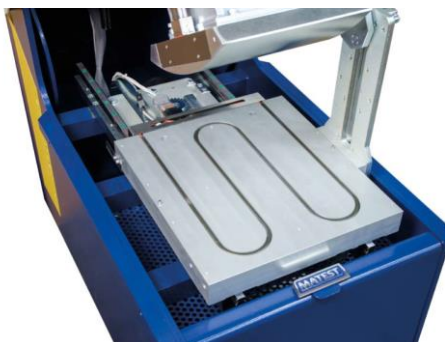


Product code	Description	Quantity
B026-05N	PAVEMIX - Automatic Asphalt Laboratory Mixer, 32 l capacity, 230V 1ph 50Hz	1
B026-10N	Material collection pan for PAVEMIX	2



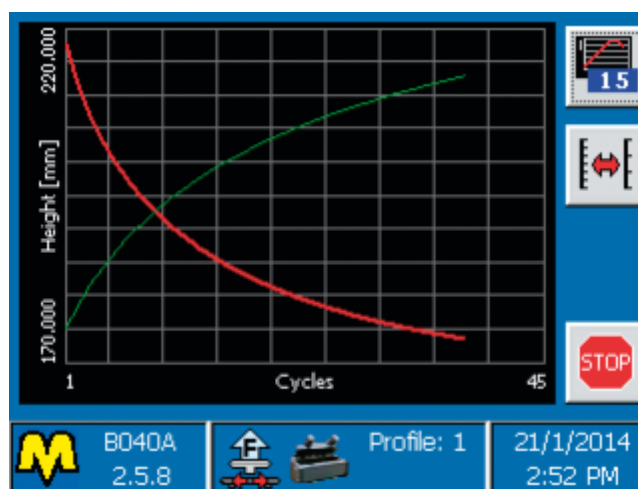


Product code	Description	Quantity
B039N	ARC - Asphalt Roller Compactor 230V 50Hz 1ph	1
B039-05R	Heated segment roller for 500x400 mm mould	1
B039-07R	Heated segment roller for 305x305 mm mould	1
B039-02	Temperature control unit for ARC	1
B039-03	Heating upgrade for the ARC sliding cart	1
B038-18	Mould with handles 500x400x180 mm	1
B038-11	Mould with handles 305x305x100 mm	1



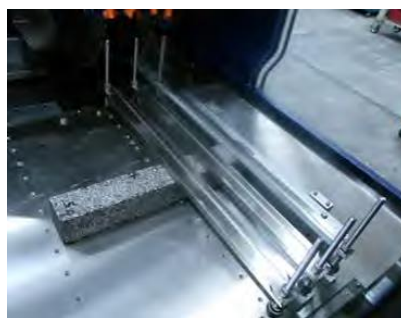


Product code	Description	Quantity
B039A	ASC - Asphalt Shear Box Compactor, 230V 1ph 50Hz	1
B039A-01	Loading chute	1
B039A-02	Tray (2 off)	1
B039A-03	Spreading comb	1
B039A-04	Levelling blade	1
B039A-05	Built-in mould heater	1



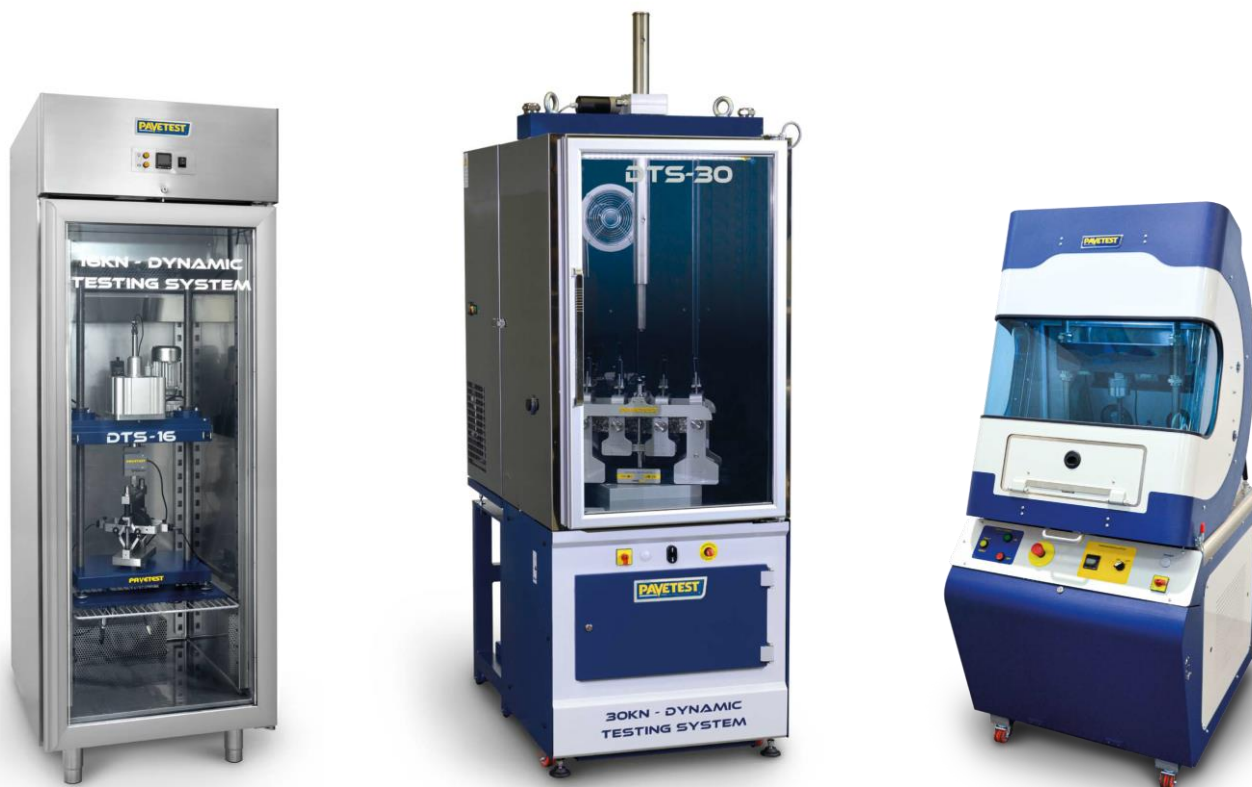


Product code	Description	Quantity
B040M	APS - Automatic Pave Saw, 400V 50Hz 3ph	1
B040-01	Diamond blade for APS, 650 mm diameter	2
B040-03	Set of spacers for mounting the APS Diamond blade 650 mm diameter	1
B040-04	Set of spacers for the two blades configuration	1
B040-06	Displacement transducer for the control of the blade position	1
B040-10M	APS manual Multi-Slab/Prism jig suitable for slabs and prisms	1
V184	Scoop, round, aluminium 500 ml	1
246228	Multi-purpose clear MS sealant and adhesive 300 ml	1
370064	Trade quality caulking gun	1
304768	Synthetic Paint Brush 100 mm	1



Determination of the resilient modulus of asphalt - Indirect tensile method

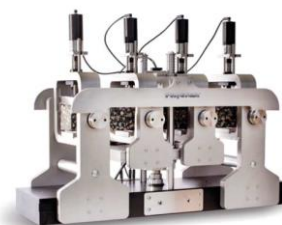
AS 2891.13.1



Product code	Description	Quantity
B220-02-KIT	DTS-16 Motorized - Servo-pneumatic Dynamic Testing System, 230V 50Hz 1ph	1
B221	Temperature controlled cabinet, range -30 +70 °C	1
<i>Alternative system with higher load capacity and testing capability:</i>		
B230	DTS-30 - Servo-hydraulic Dynamic Testing System, 230V 50Hz 1ph	1
B232	Temperature controlled cabinet, range -40 +80 °C	1
<i>Alternative system with smaller footprint and less maintenance:</i>		
B265	SmartPulse - 18 kN electro-mechanical servo-controlled dynamic testing system with temperature range from +2 to +60 °C (integrated thermoelectric climatic chamber)	1
B250-07-KIT	Temperature measuring kit	1
H009-01NZ	PC with LCD screen, includes the installation of purchased test software	1
B250-KIT	Indirect Tensile Modulus - IDTM kit	1
B250-03	Asphalt proving ring	1
B250-04	100 mm diameter pvc specimen	1
B250-05	150 mm diameter pvc specimen	1
B250-06-KIT	Torque screwdriver hexagonal head 4 mm kit	1

Characterisation of Flexural Stiffness and Fatigue Performance of Bituminous Mixes

ATM-274, AGPT-T274



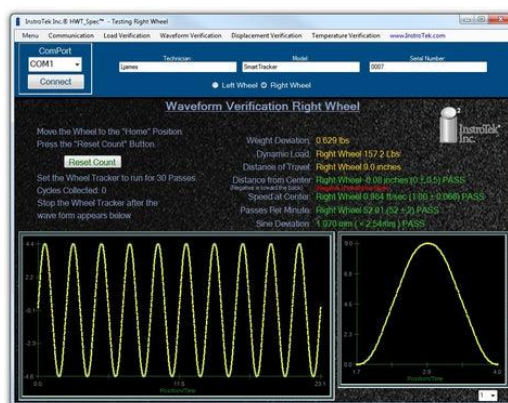
Product code	Description	Quantity
B230	DTS-30 - Servo-hydraulic Dynamic Testing System, 230V 50Hz 1ph	1
B232	Temperature controlled cabinet, range -40 +80 °C	1
B265	<i>Alternative system with smaller footprint and less maintenance:</i> SmartPulse - 18 kN electro-mechanical servo-controlled dynamic testing system with temperature range from +2 to +60 °C (integrated thermoelectric climatic chamber)	1
B250-07-KIT	Temperature measuring kit	1
H009-01NZ	PC with LCD screen, includes the installation of purchased test software	1
B212	4PB jig for DTS-30 and SmartPulse	1
B210-02	4PB PVC beam	1
B210-03	4PB reference beam	1

Deformation Resistance of Asphalt Mixtures by the Wheel Tracking Test

ATM-231, AGPT-T231



Product code	Description	Quantity
B038AM	SMARTTRACKER - Multi wheels Hamburg wet/dry wheel tracker to EN 12697-22 and AASHTO T324, 230V 50Hz 1ph	1
B038A-04	Electrovalve group for hot water	1
B038A-05N	Air heating system for air conditioning test guaranteeing uniform conditioning of temperature at 60 ± 1 °C	1
B038A-08	Rubber tyre wheel 203x50 mm to Australian AG:PT/T231 spec	2
B038A-11	EN Mould 400x305x120 mm	2
B038A-12	Set of vertical adaptors for EN mould for specimens lower than 120 mm	2
B038A-13	Set of horizontal adaptors for EN mould for 305x305 mm specimens	2
B038A-10SP	BS mould (one cylinder Ø 200x60 mm) – suitable for road cores	2
B038A-03	Support tool for AASHTO positioning	2
124.1000	HWT-Pro Load and Height Verification System	1



Deformation Resistance of Asphalt Mixtures by the Repeat Load Triaxial test

NZTA M10, NZTA T15



Product code	Description	Quantity
B220-02-KIT	DTS-16 Motorized - Servo-pneumatic Dynamic Testing System, 230V 50Hz 1ph	1
B221	Temperature controlled cabinet, range -30 +70 °C	1
<i>Alternative system with higher load capacity and testing capability:</i>		
B230	DTS-30 - Servo-hydraulic Dynamic Testing System, 230V 50Hz 1ph	1
B232	Temperature controlled cabinet, range -40 +80 °C	1
B250-07-KIT	Temperature measuring kit	1
H009-01NZ	PC with LCD screen, includes the installation of purchased test software	1
B204-16	Air Compressor 11 bar 500 litres	1
B270-03/04	Air reservoir assembly confining pressure control (03 for DTS-30, 04 for DTS-16)	1
B270-17	Ø 200 mm base plate	1
S306N	Triaxial cell, max specimen size Ø 100 x 200 mm	1
S306-10	Triaxial cell extension for Ø 150 x 300 mm samples	1
B270-02	Triaxial cell external LVDT mounting jig	1
B290-02N	Displacement transducer 10 mm	2
B293-02N	Pressure transducer 600 kPa	1
B270-10	Ø 150 mm bottom platen for AASHTO T307/TP46	1
B270-11	Ø 150 mm top platen for AASHTO T307/TP46	1
HMA-526	Latex Membrane 152.4mm Dia. x 0.635 mm thick x 457 mm long (pk/12)	5
S311-04	Ø 150 mm "O" ring (pack of 10)	1
S312-05	Ø 150 mm membrane stretcher	1
S316-04	Ø 150 mm porous disc (2 pieces)	1
S317-04	Ø 150 mm plain disc (2 pieces)	1
S318-04	Ø 150 mm "O" ring for plinth	1
S320-04	Ø 150 mm filter paper for base	1