

**B043 KIT**  
**DIGITAL MARSHALL TESTER 50 KN CAPACITY**

STANDARDS: EN 12697-34, 12697-23, 12697-12  
 ASTM D6927, D5581, D1559 | AASHTO T245  
 BS 598:107 | NF P98-251-2

The testing frame is the same as for mod. B042 KIT, but the load is measured by an electric cell 50 kN capacity with high precision strain transducers; the flow is measured by an electronic displacement transducer 50 mm stroke and  $\pm 0.1\%$  linearity.

The Cyber-Plus Evolution 8 channels digital display unit with micro-processor (technical details: see B044N-SET p. 132, Hardware technical details: see p. 19) measures and displays at the same time the stability in kN and the flow in mm with peak hold features, with the possibility to transfer them to a PC and a printer through a RS232 port.

Supplied complete with Stability mould.

**Power supply:** 230V 1ph 50Hz 900W

**Dimensions:** 650x400x1100 mm

**Weight:** 120 kg approx.

**ACCESSORIES**
**B043-01N**

SOFTWARE UTM2 (Universal Testing Machine 2)

Licence for MARSHALL test

Standards: EN 12697-34 | ASTM D6927, D5581, D1559  
 BS 598:107 | NF P98-251-2

Data processing program for "X-Y STABILITY/FLOW"

General description and technical details: see UTM2 p. 18

**B046-03**

STABILITY MOULD, **steel made**, for  $\varnothing 4"$  (101.6 mm)

Specimens to ASTM D6927.

Alternative solution to B046N mould.

Weight 9 kg approx.

**NEW**

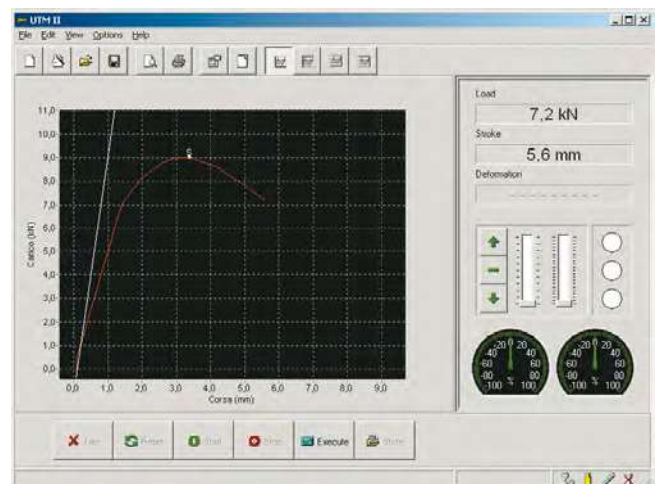

**B046N**
**B046-03**

**B043 KIT**
**SPARE**
**B046N**

STABILITY MOULD  $\varnothing 4"$  (101.6 mm)

The **aluminium made** mould, is completely open in the front so the introduction of the specimen is made easy as there is no disassembly needed.

Weight: 6 kg approx.



B043-01N: Load/deformation "x-y" graphic example

**Note:** The Digital Marshall Tester B043KIT, completed by the specific accessories (listed below) is suitable to perform also the following tests:

## DETERMINATION OF INDIRECT TENSILE STRENGTH

STANDARDS: EN 12697-23, EN 12697-12 | ASTM D6931  
AASHTO T283

### B047-02

TENSILE SPLITTING DEVICE FOR SAMPLE Ø 4" AND 6"  
Used to measure the indirect tensile strength and the radial strain of a Marshall specimen Ø 4" and 6", where a vertical load is applied. Supplied complete with loading strips to test specimens having Ø 4" and 6". Steel manufactured, plated against corrosion.

**Dimensions:** Ø 248x270 mm

**Weight:** 14 kg approx.

Alternative solution:

**B047-02S** TENSILE SPLITTING DEVICE for samples Ø 4" and 6" complete. Simple model not accepting the device B047-04 for strain measurements.



## ACCESSORIES

**B047-04** SET OF TWO LINEAR RESISTIVITY TRANSDUCERS, stroke 10 mm, accuracy and linearity  $\pm 0.3\%$  to meet CNR N.134. Complete with supports and accessories for strain measurements.

**B044-03** DISPLACEMENT TRANSDUCER, **additional**, 50 mm stroke, for a double measurement of the vertical displacement of the specimen during the tensile splitting test. Complete with cable and connector. When used with B043-02N software the average value of the two transducers is given.

**B043-02N** SOFTWARE UTM2 (Universal Testing Machine 2)  
Licence for INDIRECT TENSILE STRENGTH  
Standards: EN 12697-23, EN 12697-12 | ASTM D6931  
AASHTO T283  
General description and technical details:  
see UTM2 p. 18

## DIRECT SHEAR (LEUTNER) BETWEEN BITUMINOUS STRATA

STANDARD: ALP A StB T.80

Direct shear test (LEUTNER) on the connection between bituminous strata, carried out on asphalt cylinder specimens diameter 150 mm or 100 mm obtained from road cores or on laboratory made specimens.

## NEEDED ACCESSORIES

### B047-10

LEUTNER testing head for specimens Ø 150 mm

### B047-11

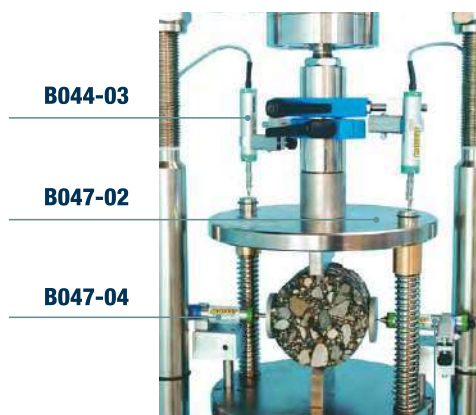
SPACERS for Ø 100 mm specimens with Leutner head.

### B043-03N

SOFTWARE for Marshall and Leutner tests.



**B047-10 + B047-11**



### B047-06

## DIGITAL UPGRADE FOR ANALOG LOAD FRAME

STANDARDS: AASHTO T283, ASTM D6931 and D4867

- For tensile strength tests performed in the lab
- 100 Hz data collection rate
- Displays exact peak load, reducing potential of operator error
- Eliminates the need for plotters and plotter pens
- Provides digital record for printing, storage or email



## WATER SENSITIVITY OF BITUMINOUS SAMPLES

STANDARD: EN 12697-12

This test determines the effect of saturation and accelerated water conditioning on the indirect tensile strength of bituminous mixtures, by evaluating the effect of moisture with different sample conditions.

Equipment: Digital Marshall tester B043KIT, indirect tensile strength accessories, and also:

### B052-02

## WATER BATH, DIGITAL, WITH COOLING DEVICE

Temperature range: +3 to +95 °C, accuracy  $\pm 1$  °C.

(EN 12697-12 Standard requires a temperature to be selected in the range of +5 to +25 °C).

Capacity: 45 litres

Inside dimensions:  
635x360x205 mm

The bath can also be used for Marshall tests and general laboratory purposes.

Technical details: see p. 135



**B052-02**

**MULTI-FUNCTION TESTING FRAMES, ALSO SUITABLE FOR MARSHALL TESTS**
**S213-05N**  
**CBR/MARSHALL 3 SPEEDS FRAME 50 KN** 

The frame is provided of three fixed speed ranges, easily selectable with a frequency changer (inverter) activated by an electric switch:

1.00 mm/min for CBR tests (as Australian and old BS Standards)

1.27 mm/min. for CBR tests

50.8 mm/min for Marshall tests.

Supplied **without** load ring and accessories which have to be ordered separately.

Technical detail: see p. 494

**S212M**  
**UNIVERSAL MULTISPEED LOAD FRAME 50KN** 

This motorized machine with electronic **digital touch-screen** controlled by microprocessor, is suitable to perform all the tests when the requested speed rate is within:

**0.05 to 63 mm/min** with max. load of 50 kN

It can therefore perform:

- Marshall test with rate of 50.8 mm/min.
- Splitting tensile test on Marshall specimens.
- Unconfined, CBR tests.

Supplied **without** load ring and accessories which have to be ordered separately.

Power supply: 230V 1ph 50-60Hz 750W

Technical Specifications: see p. 494


**S212M**


**B046-03**


**S213-05N + MARSHALL accessories**

**ACCESSORIES for S212M and S213-05N frames**

MARSHALL test, Ø 4":

- S212-05** Load piston  
**B046N** Stability mould Ø 4" (101.6 mm) **aluminium made**

As alternative:

- B046-03** Stability mould Ø 4" (101.6 mm), **steel made** 


- B047** Flow meter  
**B047-01** Dial gauge for flow meter  
**S370-08S** Load ring 30kN with electric stop safety device  
**S374** Brake device to hold max. load

MARSHALL test Ø 6"

STANDARD: ASTM D5581

- S212-05** Load piston  
**B046-02** Stability mould Ø 6"  
**B047** Flow meter  
**B047-01** Dial gauge for flow meter  
**S370-10S** Load ring 50 kN with electric stop safety device  
**S374** Brake device to hold max. load


**B046-02**

 **Note:** The frames S212M and S213-05N are suitable also for tensile splitting tests (EN 12697-23, ASTM D6931, AASHTO T283) by using the specific devices described on p. 123

**MULTIFUNCTION TESTING FRAMES:**

COMBINED WITH "CYBER-PLUS 8 EVOLUTION", COMPUTERIZED DIGITAL DISPLAY SYSTEM

Technical Specifications:

The frame is the same as for the previous load frames (mod. S212N - S213-05N), but the load is measured by an electric 50kN cell with high precision strain transducers. The deformation (flow) is measured by a displacement transducer 50 mm stroke and  $\pm 0.1\%$  independent linearity. The **CYBER-PLUS 8 EVOLUTION** computerized multichannel digital display system (technical details: see mod. B044N-SET on p. 132), measures and displays at the same time load (stability) in kN and deformation (flow) in mm with peak hold features and possibility to print certificates and graphics directly on a laser printer via USB or to transfer them to PC via Ethernet.

**S214-05N KIT****CBR/MARSHALL 3 SPEED LOAD FRAME** 

DIGITAL TOUCH-SCREEN, COMPUTERIZED

Technical details of the frame: see mod. S213-05N, p. 494

Supplied complete with "Cyber-Plus 8 Evolution" system (B044N-SET, details on p. 000, Hardware details at p.19), load cell and displacement transducer, but **without** accessories to be ordered separately.

**S215A****UNIVERSAL MULTISPEED LOAD FRAME**

DIGITAL, TOUCH-SCREEN, COMPUTERIZED

Technical Spec. of the frame: see mod. S212N at p. 494

Technical Spec. of S215A: see p. 19

Supplied **without** accessories for Marshall, CBR, Unconfined tests and Software, to be ordered separately.

**S214-05N KIT + MARSHALL accessories**

SOFTWARES FOR THE FRAMES COMBINED WITH "CYBER-PLUS 8" SYSTEM:

**B043-01N** SOFTWARE UTM2 (Universal Testing Machine 2)  
Licence for **MARSHALL** test.

Standards: EN 12697-34 | ASTM D6927, D5581, D1559

**B043-02N** SOFTWARE UTM2 (Universal Testing Machine 2)  
Licence for **TENSILE SPLITTING** test.

Standards: EN 12697-23 | ASTM D6931

Description and technical details of Software UTM2: see p. 18

**H009-01** PERSONAL COMPUTER, complete with LCD monitor 22", keyboard, mouse, connection cables, installation and setting up of the purchased software.

**C128** Laser printer, for the graphic and test certificate printing, to be connected directly to Cyber-Plus 8 through USB.

**C127N** On board graphic printer on thermo-paper

 **Note:** The frames S214-05N KIT and S215A are suitable also for tensile splitting and direct shear (Leutner) test, by using the specific devices described at p. 123

**ACCESSORIES for the frames, mod. S214-05N KIT and S215A**

**S212-05** LOAD PISTON

**B046N** STABILITY MOULD Ø 4" aluminium made, or

**B046-03** STABILITY MOULD Ø 4" steel made 

**B046-02** STABILITY MOULD Ø 6" Standard: ASTM D5581