

## 17000 SERIES PENETROMETERS

ASTM D5; D217; D937; D1403; D1321; D1831; D2884; IP 49; IP 50; IP 179; IP 310; IP 376; BS 1377; BS 2000 Parts 49, 50, & 179; BS 2499 Part 3; EN 1426; ISO 2137; DIN 51 579; DIN 51 580; NF T60-119; NF T60-132; NF T60-140; NF T66-004; JIS K2220

### 17500-0 SETAMATIC PENETROMETER

- Microprocessor controlled
- Penetration range 0 to 700 Pen (70mm)
- Timer range 1 to 9999 seconds
- Automatic plunger release and retention
- Flexi light
- RS232C interface

The 17500-0 Setamatic Penetrometer is a microprocessor-controlled instrument with a range of 0 to 70mm (700 Pen). Plunger release and retention is automatic and results are shown on the digital display in either millimetres or 'pen' units. Soak and penetration times may be set from 0 to 9999 seconds. An RS232C interface is provided for connection to a personal computer.

The machined aluminium base is fitted with a flexible light with dimmer switch, and a spirit level. The counterbalanced head has a geared two-speed raising and lowering mechanism, and contains the control circuits, keypad and fluorescent display. The head may be rotated through 180°.

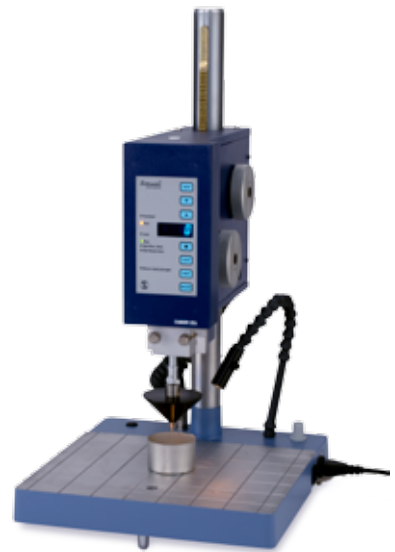
**SUPPLIED WITH:** 47.5g plunger, 50g and 100g plunger weights, mains lead and instruction manual.



CALIBRATION & VERIFICATION MATERIALS



SETAPLUS EXTENDED WARRANTY AVAILABLE



17500-0  
(Cone and container supplied separately)

#### SPECIFICATIONS

<b>Penetration Range:</b>	0 to 700 Pen (70mm)
<b>Penetration Time:</b>	1 to 9999 seconds, fully variable
<b>Retention/Release:</b>	Automatic
<b>Display:</b>	4 Digit, Fluorescent
<b>Voltage:</b>	110/120V or 220/240V, 50/60Hz (switchable)
<b>Power:</b>	40W
<b>Size (HxWxD):</b>	59 x 30 x 33cm
<b>Weight:</b>	12.5kg

### 17190-2 SETA UNIVERSAL PENETROMETER WITH INTEGRAL CONTROLLER

- Penetration range 0 to 400 Pen (40mm)
- 5, 8, 10, 12, 30 and 60 second timer settings
- Solid state timer
- Automatic plunger release and retention
- Flexi light

A semi-automatic penetrometer with a range of 0 to 40mm (400 Pen). Plunger release and retention is controlled by a solid state timer which can be set for penetration times of 5, 8, 10, 12, 30 and 60 seconds.

The head is fitted with a two speed elevating mechanism for quick and precise positioning of the penetration tip. Penetration is shown on a 150mm dial, graduated 400 x 0.1mm increments, equipped with a slipping clutch pointer.

The machined aluminium base is fitted with a flexible light with dimmer switch, and a spirit level.

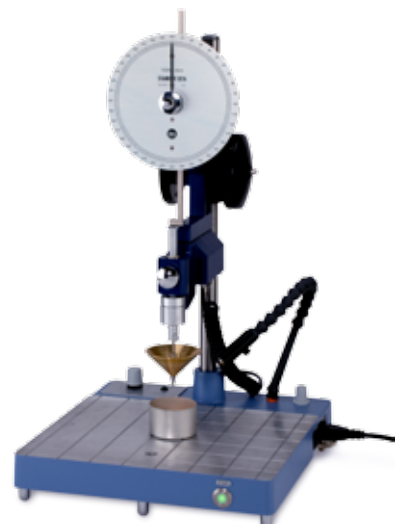
**SUPPLIED WITH:** 47.5g plunger, 50g and 100g plunger weights, mains lead and instruction manual.



CALIBRATION & VERIFICATION MATERIALS



SETAPLUS EXTENDED WARRANTY AVAILABLE



17190-2  
(Cone and container supplied separately)

#### SPECIFICATIONS

<b>Penetration Range:</b>	0 to 400 Pen (40mm)
<b>Penetration Time:</b>	5, 8, 10, 12, 30, 60 seconds, selectable
<b>Retention/Release:</b>	Automatic
<b>Display:</b>	150mm dial, 400 x 0.1mm increments
<b>Voltage:</b>	110/120V or 220/240V, 50/60Hz (switchable)
<b>Power:</b>	45W
<b>Size (HxWxD):</b>	67 x 30 x 33cm
<b>Weight:</b>	9kg

17000 SERIES PENETROMETERS

17000-2 SETA UNIVERSAL PENETROMETER

- Penetration range 0 to 400 Pen (40mm)

A manual penetrometer with a range of 0 to 40mm (400 Pen).

The head is fitted with a two speed elevating mechanism for quick and precise positioning of the penetration tip. Penetration is shown on a 150mm dial, graduated 400 x 0.1mm increments, equipped with a slipping clutch pointer.

The machined aluminium base has an integral spirit level.

SUPPLIED WITH: 47.5g plunger, 50g and 100g plunger weights, and instruction manual.



SPECIFICATIONS

Penetration Range:	0 to 400 Pen (40mm)
Retention/Release:	Manual
Display:	150mm dial, 400 x 0.1mm increments
Size (HxWxD):	67 x 30 x 33cm
Weight:	7kg



17000-2  
(Cone and container supplied separately)

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ACCESSORIES - 17000 Series Penetrometers

REQUIRED	17500-0	17190-3	17000-2
PENETRATION CONES, NEEDLES, PLUNGERS and KITS			
Either refer to the table to select the individual items required for a test method, or select an appropriate Penetration Kit			
OPTIONAL			
18580-0	●	●	●
17120-0		●	●
18200-5	●	●	●
22750-2			●
CALIBRATION, VERIFICATION & TRAINING			
17150-0	●	●	●
99856-0	●	●	●

ITEMS REQUIRED FOR EACH TEST

	ASTM D5	ASTM D217	ASTM D937	ASTM D1321	ASTM D1403	ASTM D1831
Needles, Cones & Plungers	18500-0, 18510-0 or 18512-0 or 18520-0	18140-0 or 18000-0	18000-0	18490-0	17910-0 + 17950-0 or 18060-0 +17380-0	17910-0 + 17950-0 or 18060-0 +17380-0
Sample Container	18470-0 or 18530-0	see Grease Workers	18120-0	18480-0 & 18481-0	see Grease Workers	see Grease Workers
Transfer Dish	18550-0					
Grease Worker		17510-0, 17620-0, or 17790-0			17850-0 or 17920-0	17850-0 or 17920-0
Overflow Ring		17520-0				
Grease Cutter		18150-0				
Bath	18200-5	18200-5	18200-5	18200-5	18200-5	18200-5
Thermometer	ASTM17C, 63C or 64C		IP38C	ASTM64C		
Roll Stability Tester						19400-3

Note: for ASTM D5 tests, Starter Kit 18580-0 contains three 18520-3 Needles, ten 18530-0 Containers and one 18550-0 Transfer Dish

## PENETRATOR KITS

- Kits of needles/cones, containers, weights and plungers for specific tests/samples
- Compatible with 0.375 inch (9.53mm) plunger diameter penetrometers and SETA 17000 Series



18101-0

SETA PART	METHOD	EQUIPMENT	APPLICATIONS
18101-0 Penetrator Kit No. 1	ASTM D5; IP 49; DIN 1995; DIN 52 010	Plunger (47.5g); weight (50g); 50 containers; transfer dish; 3 standard bitumen needles	Bituminous materials; confectionery; cosmetics; soap; yeast; chocolate; lipstick; compact powders
18102-0 Penetrator Kit No. 2	ASTM Micro	Micro cone (5g); Plunger (15g); Micro grease container (3 part)	Lubricants; solid or semi-solid pharmaceutical/cosmetic creams
18103-0 Penetrator Kit No. 3	Klein Micro	Micro cone (7g); Plunger (16.8g); Micro grease container (3 part)	Lubricants; solid or semi-solid pharmaceutical/cosmetic creams
18104-0 Penetrator Kit No. 4	ASTM Tapered Hole Disc	Plunger (47.5g); fat/grease sample container; ASTM perforated disc penetrator (102.5g)	Semi-liquid greases/creams; jams; fruit purees; mustards; ketchup; paints; varnishes; printing inks; lacquers
18105-0 Penetrator Kit No. 5	Pin needle	Plunger (15g); weight (2g); 3 brass pin needles; 3 stainless steel pin needles	Putty; fruit; viscous pastes; cheese
18106-0 Penetrator Kit No. 6	Cone tipped cylinder	Plunger (15g); 2 cone-tipped cylinders (15g and 35g)	Toothpaste; soft pastes; printing inks
18107-0 Penetrator Kit No. 7	AOSC Standard Cc 16-60	Plunger (47g); AOSC 20° aluminium cone (45g)	Confectionery; edible fats (butter, margarine); solid emulsions
18108-0 Penetrator Kit No. 8	Unilever	Plunger (47.5g); weight (80g); 40° aluminium cone (31.5g)	Confectionery; edible fats (butter, margarine); solid emulsions
18109-0 Penetrator Kit No. 9	Tapered Hole Disc	Plunger (15g); 3 weights (5g, 10g and 20g); tapered perforated disc (19.5g)	Mayonnaise; mustard; semi-liquid fats; rubber solutions
18110-0 Penetrator Kit No. 10	Penetration rod	Plunger (47.5g); penetration rod, 6.3mm diameter (6.4g)	Silicone rubber

## PENETRATION CONES

ASTM D217; D937; D1403; IP 50; IP 179; IP 310; BS 2000 Parts 50 & 179; ISO 2137; DIN 51 580; DIN 51 804 (obs); NF T60-119 (unless otherwise stated)

- 3.17mm (1/8 inch) stem diameter

18000-0



18140-0



SETA PART	BODY	MASS	NOTES
18140-0 SETA ASTM-IP Standard Cone	Acetyl; Solid; Conical	102.5g ±0.05g	
18051-0 SETA ASTM-IP Standard Cone	Acetyl; Solid; Conical	102.5g ±0.05g	CONFORMANCE CERTIFICATE (UKAS) IP 50 only
18000-0 SETA ASTM-IP Optional Cone	Brass; Hollow; Conical	102.5g ±0.05g	
18050-0 SETA ASTM-IP Optional Cone	Brass; Hollow; Conical	102.5g ±0.05g	CONFORMANCE CERTIFICATE (UKAS) IP 50 only
17910-0 SETA Quarter-Scale Cone	Plastic; Conical	3g ±0.025g	Use with Ultra Light-Weight Plunger 17950-0
18060-0 SETA Half-Scale Cone	Brass; Conical	22.5g ±0.025g	Use with Light-Weight Plunger 17380-0
18080-0 SETA Special Full-Scale Cone	Aluminium; Conical	29.8g ±0.05g	

## PENETRATION NEEDLES

ASTM D5; IP 49; BS 2000 Part 49; DIN 52 010; EN 1426; NF T66-004 (unless otherwise stated)

- 3.17mm (1/8 inch) stem diameter

18510-0



SETA PART	MASS	NOTES
18520-0 SETA Standard Penetration Needle	2.5g	Pack of 3
18510-0 SETA Standard Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS) IP 49/EN 1426 only
18512-0 SETA Standard Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS) ASTM D5
18500-0 SETA Penetration Needle	2.5g	For penetrations between 350 & 500, pack of 3
18490-0 SETA Wax Penetration Needle	2.5g	ASTM D1321; IP 376; DIN 51 579
18492-0 SETA Wax Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS)

PLUNGERS



ASTM D1403; IP 310; DIN 51 804; ISO 2137

SETA PART	MASS	NOTES
17380-0 SETA Light-Weight Plunger	15g ±0.025g	Use with 18060-0 Half-Scale Cone
17950-0 SETA Ultra Light-Weight Plunger	6.38g ±0.025g	Use with 17910-0 Quarter-Scale Cone

SAMPLE CONTAINERS & DISHES



SETA PART	DESCRIPTION	METHOD
18120-0 SETA Sample Container (Petrolatum)	Brass; 102mm dia; 65mm deep; water-tight lid; cylindrical with flat bottom	ASTM D937; IP 179; BS 2000 Part 179; DIN 51 580; ISO 2137; FTMS 791 312
18470-0 SETA Sample Container (Bitumen)	For penetrations 200 and 350; 69mm dia; 46mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49; EN 1426
18530-0 SETA Sample Container (Bitumen)	For penetrations below 200; 55mm dia; 35mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49
18535-0 SETA Sample Container (Bitumen)	For penetrations below 40; 33-50mm dia; 8-16mm deep; pack of 1000	ASTM D5
18540-0 SETA Sample Container (IP 49)	For penetrations 200 and 350; 55mm dia; 55mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49
18570-0 SETA Slip Cover (for 18530-0)	For use with 18530-0	ASTM D5; IP 49; BS 2000 Part 49
18550-0 SETA Transfer Dish	Copper; for transferring containers from water bath to penetrometer; pack of 2	ASTM D5; IP 49; BS 2000 Part 49
18560-0 SETA 4-Way Micro Penetration Cup	For Bitumen; For rapid quality control tests not in compliance with the test methods listed	
18480-0 SETA Test Specimen Container (Wax)	Brass; 25.4mm dia; 31.8mm deep; pack of 2	ASTM D1321; IP 376; DIN 51 579
18481-0 SETA Brass Base Plate (for 18480-0)	Supports two 18480-0 wax containers	ASTM D1321; IP 376; DIN 51 579

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WATER BATHS

18200-5 SETA WATER BATH



- Wide range of applications
- 18 litre capacity
- Compact footprint

A small footprint water bath with digital control and a temperature range from ambient +5°C to 100°C. The control unit/heater unit incorporates a stirrer, and overtemperature and low-level cutouts. Control at near ambient temperatures is obtained by using either the 18203-0 Cooling Unit with Coil or the 18204-0 Cooling Coil shown in Accessories.

The bath is manufactured from stainless steel and is equipped with a stainless steel pent roof lid.

SUPPLIED WITH: perforated draining shelf to support sample containers, mains lead and instruction manual.

ACCESSORIES - Water Bath	
OPTIONAL	
15650-0	WATER PURIFIER, to minimise scale production. Suitable for domestic water supply, 60l/hr max. flow. Comprises disposable cartridge with capacity for 960L soft water or 180L hard water.
18203-0	COOLING UNIT WITH COIL, chilled recirculating unit which extends the range of the bath to operate at sub-ambient temperatures. <b>Voltage:</b> 110/120V, 50/60Hz 220/240V, 50/60Hz
18204-0	COOLING COIL, uses a supply of cooling water to facilitate proper control at ambient or near ambient temperatures.
<b>THERMOMETERS:</b> ASTM63C; ASTM63F; ASTM64C; ASTM64F; ASTM17C; ASTM17F; IP38C	

SPECIFICATIONS	
<b>Temperature Range:</b>	Ambient +5°C to 100°C (0°C to 100°C with cooling)
<b>Temperature Stability:</b>	±0.1°C
<b>Capacity:</b>	18 litres
<b>Voltage:</b>	110/120V, 50/60Hz 220/240V, 50/60Hz
<b>Power:</b>	1.5kW
<b>Size (HxWxD):</b>	40 x 34 x 36cm
<b>Weight:</b>	10kg

18200-5