PENETROGRAPH

The penetration resistance of the ground can be determined in the field, using a penetrometer. One of the range of penetrometers is the mechanical recording penetrograph.

The penetration resistance

The penetration resistance is a means of determining the ground load-bearing capacity, and the ease with which roots will grow through the ground.

Determining the load-bearing capacity is of the greatest importance in the design of foundations for civil engineering works (building work, laying runways, the design of dikes and roads, etc.). There is also a requirement for quantitative measurements of the ground profile, for agricultural and cultivation purposes, in connection with all aspects of land utilisation (ease of root penetration plays an important role in the provision of planted public areas).

Penetrograph

06.02

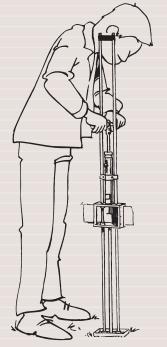
The penetrograph is a devise for determination of the penetration resistance of the ground. The standard set is equipped with various penetration cones, recorder pens, probe rods and recording charts. The entire set, including spare parts, instructions, cone check and the tool are packed in an aluminium carrying/transport case. Every penetrograph is supplied with a quality test report. The penetrograph measuring range is up to 5000 kN/m² (= 5 MPa) and is suitable for measurements at depths up to 0.80 m.

Continuous measurements can be made with the penetrograph, recording each layer of the ground profile up to 0.80 m on the chart.

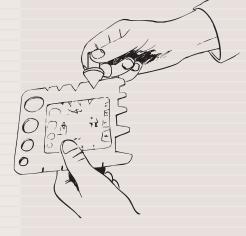
You will return to the contents of P1 SOIL by clicking the pictogram

P1.51

While measuring the penetration resistance of the soil, the probe-cone is pressed vertically into the ground.



The cone check is used to inspect the wear of the cones.



06.02 Penetrograph

- Writes obtained forces with depth on chart
- Will perfectly show disturbing layers
- Will proof compaction situation
- Weather proof charts
- One-push measurement
- For contractors and agronomists
- Weather proof (stainless steel) body



www.eijkelkamp.com



Penetrograph, standard set

Penetrograph



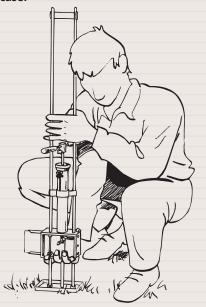


PENETROGRAPH

You will return to the contents of P1 SOIL by clicking the pictogram

P1.51

The penetrograph may never be with-drawn from the ground on the guide rods. When withdrawing it, the hand is held below the recorder case.

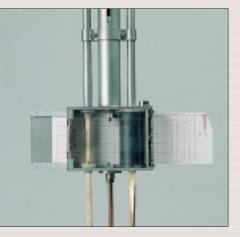


In addition, the penetrograph is self-recording, i.e. during the measurement the resistance is immediately graphically recorded. This greatly reduces the amount of work to be done afterwards, the data can be immediately transferred and it is easy to store. The principle of the measurement is based on the compression of a calibrated spring, while at the same time the chart is moved in proportion to the depth by the drive pulley. To check if the penetration into the ground by the probe rod and cone is vertical, the penetrograph is fitted with a bascule spirit-level. The penetration should be as close as possible to the vertical, to keep the pressure and friction on the probe rod to the lowest possible levels.

Applications

The penetrograph is used for:

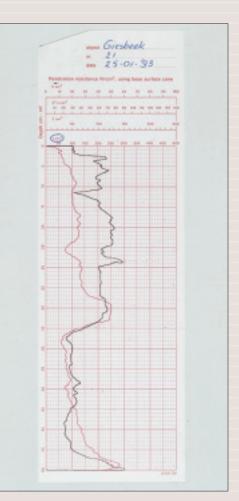
- general soil science examinations (e.g. for profile descriptions, obtaining data for evaluating the suitability of soils).
- checking the suitability of soils for carrying vehicles or pedestrians.
- checking artificially-made compactions (e.g. sand-filled trenches).
- checking load-bearing capacity for the installation of underground tanks.
- the detection of compacted (possibly impenetrable) sub-soil layers (e.g. layers compacted below ploughed depth).
- research into poor growing conditions, including those for trees in urban streets and parks.
- research into the connection between the intensity of rooting of specific crops and the resistance to penetration of the soil layers present.



Recording instrument



Cones



Recording chart

PARTS LIST

angle 60 deg. **06.01.04.02 Cone, base area 2 cm ² , 1 angle 60 deg. **06.01.04.03 Cone, base area 3 tr3 cm ² , 1 angle 60 deg. **06.01.05.04 Cone, base area 5 cm ² , 1 angle 60 deg **06.02.02 Probing rod, 0 8 mm, 1 length 80 cm, (6 roc on 1 cm ²) **06.02.03 Probing rod, 0 10 mm, 1 length 80 cm, (6 roc on 2 cm ² to cone 5 cm ²) **06.02.01 Penetrograph with 1 compression spring for measurements to 5000 KM ² to cone 5 cm ²) **06.02.04 Registration cards for 1 penetrograph, pack of 250 pcs. **06.02.05 Aluminium carying case, 1 dim. 1032265115 cm (outside) **01110.201 Paelock **05.02.05 Red pen 2 **95.004 Screw driver, 4 mm bit 1 **995.012 Spanner 12x13 mm 2 **995.012 Spanner 12x13 mm< 2 **995.012 Spaner 2x13 mm< 2 **95.012 Cone, base area 1 cm ² , angle 30 deg. 06.0	Art.no.	Description	Qty. in set	Art.no.	Description	Qty. in set
delivered as a complete set for carrying case). 05.02 Penetrograph, standard set for measurements to angle 60 deg. **06.01.02.01 Cone, base area 1 cm ² , angle 60 deg. 1 **06.01.03.02 Cone, base area 2 cm ² , angle 60 deg. 1 **06.01.03.02 Cone, base area 2 cm ² , angle 60 deg. 1 **06.02.03 Probing rod, 0 8 mm, length 80 cm, (for cone 1 cm ²) 1 **06.02.03 Probing rod, 0 8 mm, length 80 cm, (for cone 2 cm ²) 1 **06.02.03 Penetrograph, kth deg 1 **06.02.04 Registration cards for measurements to 5000 kMm ² 1 **06.02.05 Registration cards for some area in the second seco	P1.51	Penetrograph				
set for measurements to a depth of 80 cm. **06.01.02.01 Cone, base area 1 cm ² , angle 60 deg. **06.01.03.02 Cone, base area 2 cm ² , angle 60 deg. **06.01.03.02 Cone, base area 2 1/3 cm ² , 1 angle 60 deg. angle 60 deg. **06.01.03.02 Cone, base area 3 1/3 cm ² , 1 angle 60 deg. angle 60 deg. **06.01.05.04 Cone, base area 5 cm ² , angle 60 deg. **06.01.05.04 Cone, base area 5 cm ² , angle 60 deg. **06.02.02 Probing rod, 0 8 mm, 1 length 80 cm, (for cone 1 cm ²) length 80 cm, (for cone 2 cm ²) **06.02.01 Penetrograph with 1 1 comperssion spring for measurements to 5000 kWm ² (50 kg/fcm ²), incl. text report **06.02.03 Red pserver, ind. black pen 1 **06.02.04 Red pserver, ind. black pen 1 **06.02.05 Red pserver, ind. black pen 1 **06.02.06 Spanner 12.01 3m 2 **95.0.01 Bag for tools 1 **06.02.02 Spanner 12.13 mm 2 **95.0.02 Spanner 12.13 mm 2 **95.0.01 Bag for tools 10.30.2,0 **0		delivered as a complete				
**06.01.03.02 Cone, base area 2 (cm ² , 1 angle 60 deg. **06.01.05.04 Cone, base area 3 1/3 (cm ² , 1 angle 60 deg. **06.01.05.04 Cone, base area 5 (cm ² , 1 angle 60 deg. **06.02.02 Probing rod, 0 8 mm, 1 length 80 cm, (for cone 1 (cm ²) **06.02.03 Probing rod, 0 10 mm, 1 length 80 cm, (for cone 2 (cm ²) to cone 5 cm ²) **06.02.04 Penetrograph with 1 compression spring for measurements to 5000 kM/m ² (S0 kgf(cm ²), incl. test report 1 Penetrograph with 250 pcs. **06.02.05 Aluminium carying case, 1 dim. 1032&&Cl.15 cm (outside) **01.10.2.01 Penetrograph, pack of 250 pcs. **06.02.05 Aluminium carying case, 1 dim. 1032&&Cl.15 cm (outside) **01.10.2.01 Penetrograph mith 1 **095.0.02 Screw drive, 4 mm bit 1 **995.0.07 Spanner 7x9 mm 1 **995.0.07 Spanner 7x9 mm 1 **995.0.07 Spanner 7x121 mm 2 **995.0.01 Bag for tools 1 **06.01.22.01 Gol.122.07 Cone, base area 1 (cm ² , angle 30 deg. Gol.122.07 Cone, base area 2 cm ² , angle 30 deg. Gol.122.10 Cone, base area 2 cm ² , angle 30 deg. Gol.122.11 Cone, base area 2 cm ² , angle 30 deg. Gol.122.10 Cone, base area 3 (cm ² , angle 30 deg. Gol.122.11 Cone, base area 2 cm ² , angle 30 deg. Gol.122.10 Cone, base area 5 cm ² , angle 30 deg. Gol.122.11 Cone, base area 5 cm ² , angle 30 deg. Gol.122.12 Cone, base area 5 cm ² , angle 30 deg. Gol.122.12 Cone, base area 5 cm ² , angle 30 deg. Gol.122.11 Cone, base area 5 cm ² , angle 30 deg. Gol.122.12 Cone, base area 1 cm ² , angle 30 deg. Gol.122.11 Cone, base area 5 cm ² , angle 30 deg. Gol.122.12 Cone, base area 1 cm ² , angle 30 deg. Gol.122.13 Cone, base area 5 cm ² , angle 30 deg. Gol.122.14 Cone, base area 5 cm ² , angle 30 deg. Gol.122.15 Pen bearer, incl. black pen Bag of tools and spare parts Spare	06.02	set for measurements to				
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**06.01.04.03 angle 60 deg. **06.01.05.04 Cone, base area 5 cm ² , 1 angle 60 deg. **06.02.02 Probing rod, 0 8 mm, 1 length 80 cm, (for cone 1 cm ²) **06.02.03 Probing rod, 0 10 mm, 1 length 80 cm, (for cone 2 cm ² to cone 5 cm ²) **06.02.01 Penetrograph with 1 compression spring for measurements to 5000 kMm ² (50 kgf/cm ²), incl. test report **06.02.04 Registration cards for 1 penetrograph, pack of 250 pcs. **06.02.05 Red pen 2 **01.11.02.01 Padlock 1 **01.11.02.01 Padlock 1 **05.02.01.53 Pen bearer, incl. black pen 1 **99.50.01 Spanner 12x13 mm 2 **99.50.02 Spanner 12x13 mm 2 **99.50.01 Bag for tools 1 **06.02.05 Model 0.05.04 Screw driver, 4 mm bit 1 **99.50.07 Spanner 7.24 mm **06.01.22.07 Cone, base area 1 cm ² , angle 30 deg. 66.01.22.07 Cone, base area 1 cm ² , angle 30 deg. 66.01.22.07 Cone, base area 2 cm ² , angle 30 deg. 66.01.22.07 Cone, base area 1 cm ² , angle 30 deg. 66.01.22.01 Spanner 45.00 Optional items 06.01.22.11 Cone, base area 2 cm ² , angle 30 deg. 66.01.22.05 Cone, base area 1 cm ² , angle 30 deg. 66.01.22.07 Cone, base area 1 cm ² , angle 30 deg. 66.01.22.08 Cone, base area 3 1/3 cm ² , angle 30 deg. 66.01.22.01 Spare parts 06.02.01.53 Pen bearer, incl. black pen 66.02.01.53 Pen bearer, incl. black pen 96.02.01.53 Pen bearer, incl. black pen 95.02.01 Pad terpet terpet and eventual a	**06.01.03.02	Cone, base area 2 cm ² ,	1			
**06.01.05.04 Cone, base area 5 cm², 1 angle 60 deg 1 **06.02.02 Probing rod, Ø 8 mm, 1 length 80 cm, (for cone 1 cm²) ** **06.02.01 Penetrograph with 1 to cone 5 cm²) ** **06.02.01 Penetrograph with 1 compression spring for measurements to 5000 kN/m² (50 kgf/cm²), ind. test report 4 **06.02.04 Registration cards for 1 penetrograph, pack of 250 pcs. ** **06.02.05 Paloet arr/m carying case, 1 dim. 103x26x11.5 cm (outside) ** **95.00.01 Samer 12x13 mm 2 **99.50.01 Spanner 12x13 mm 2 **99.50.01 Spanner 12x13 mm 2 **99.50.01 Spanner 12x13 mm 2 **99.50.01 Bag for tools 1 **06.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.07 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.01 Cone, base area 1 cm², angle 30 deg. 0 60.01.22.02 Cone, base area 2 cm², angle 30 deg. 0 60.01.22.03 Pen baser, incl. black pen 0 60.02.01.53.00 Red pen 2 50.02.01 Salak pen 0 60.02.01.53.00 Red pen 1 50.02.01 Salak pen 0 60.02.01.53.00 Red pen 1 50.02.01 Salak pen 0 50.02.01 Salak	**06.01.04.03	Cone, base area 3 1/3 cm ² ,	1			
06.02.02 Probing rod, 0 8 mm, 1 length 80 cm, (for cone 1 cm ²) **06.02.03 Probing rod, 0 10 mm, 1 length 80 cm, (for cone 2 cm ²) **06.02.01 Penetrograph with 1 compression spring for measurements to 5000 kN/m ² (50 kgf/cm ²), incl. test report **06.02.01 Registration cards for 1 penetrograph, pack of 250 pcs. **106.02.01.53 Pan bearer, incl. black pen 1 **06.02.01.53 Pan bearer, incl. black pen 1 **06.02.01 Spanner 7x9 mm 1 **995.01.02 Spanner 7x9 mm 1 *995.01.7 Spanner 7x9 mm 1 ***995.01.2 Spanner 7x9 mm 2 ***995.01.2 Spanner 7x9 mm 1 ****06.01.26 Inspection ig for cones 1 06.01.02.01, 06.01.03.02, 06.01.03.02, 06.01.03.04, according to NEN 5740. 06.01.22.07 Cone, base area 1 cm ² , angle 30 deg. 06.01.22.08 Cone, base area 3 1/2 cm ² , angle 30 deg. 06.01.22.09 Cone, base area 3 1/2 cm ² , angle 30 deg. 06.01.22.10 Cone, base area 1/2 cm ² , angle 30 deg. 06.01.22.10 Cone, base area 1/2 cm ² , angle 30 deg. 06.01.22.10 Cone, base area 1/	**06.01.05.04	Cone, base area 5 cm ² ,	1			
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repair advice when deviations occur						
		repair advice when deviations of	occur			

