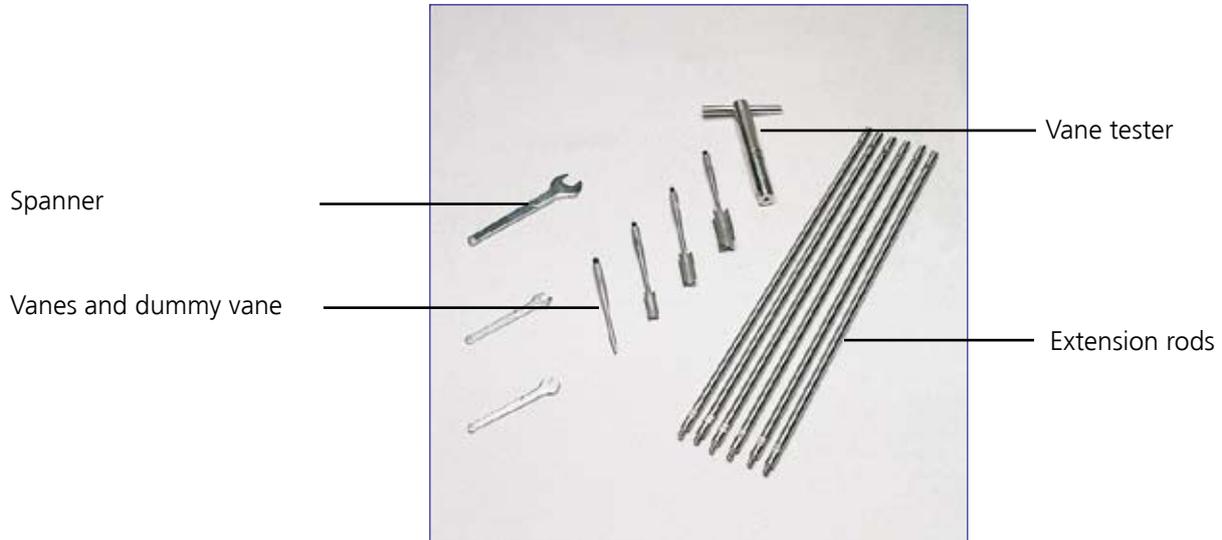




FIELD INSPECTION VANE TESTER

OPERATING INSTRUCTIONS



14.05 Field inspection vane tester, standard set for measurements to 200 kPa (20 t/m²) and a depth of 3 m

1. Purpose

The inspection vane tester is used to measure the in-situ undrained shear strength in clays. It is primarily intended for use in trenches and excavations at a depth not influenced by drying and excavation procedures. The range of the instrument is from 0 to 260 kPa when three different sized vanes are used. The accuracy of the instrument should be within 10% of the reading.

2. Description

The measuring part of the instrument is a spiral spring (3 see drawing on page 2), (maximum torque transmitted 38 kg/cm). When the handle (1) is turned, the spring deforms and the upper part (4) and the lower part (8) of the instrument get a mutual angular displacement. The size of this displacement depends on the torque which is necessary to turn the vane (11). By means of a graduated scale (5) the shear strength of the clay is obtained.

The lower and upper halves of the instrument are connected by means of threads. The scale (5) is also supplied with threads and follows the upper part of the instruments by means of two lugs. The 0-point is indicated by a line on the upper part (4). When torque is applied, the scale-ring follows the upper part of the instrument and when failure is obtained, the scale-ring (5) will remain in its position due to friction in the threads.

Three sizes of the four-bladed vanes (11) are used:

16 x 32 mm (extra)	Multiply readings by 2
20 x 40 mm (standard)	Direct reading
25.4 x 50.8 mm (extra)	Multiply readings by 0.5

This makes it possible to measure shear strength of 0-260, 0-130, and 0-65 kPa respectively.

The area ratio of the vanes are 14, 16.5, and 24% (ratio of cross sectional area of vane to the area to be sheared). The vane blades are soldered to vane shaft (9) which again is extended by one or more 0.5 m long rods. The connection between the shaft rods and the instrument is made by threads. To make the connection as straight as possible,

All it takes for environmental research

P.O. Box 4, 6987 ZG Giesbeek,
the Netherlands

T +31 313 88 02 00
F +31 313 88 02 99

E info@eijkamp.com
I www.eijkamp.com



the rods have to be screwed tightly together and the threads should be clean.

The maximum shear strength that can be measured with the inspection vane tester is 260 kPa. In clays with this strength a force of about 40-50 kg is required to press the vane down into the clay. The vane shaft is designed to take this force, but if extension rods are used, precautions against buckling are required.

3. Instructions for use

3.1 General procedure

1. Connect required vane (11) and extension rods to the inspection vane instrument.
(Important: When screwing vane rods to instrument, hold onto lower part of instrument)
2. Push vane into ground to required position.
(Important: Do not twist inspection vane during penetration)
3. Make sure the graduated scale (5) is set to 0 position.
4. Turn handle (1) clockwise slowly with a constant speed.
5. When the lower part (8) follows the upper part (4) around or even falls back, failure and maximum shear strength is obtained in the clay at the vane.
6. Holding handle firmly, allow it to return to 0 position. Be careful not to let the handle spring back uncontrolled.
7. Note the reading on the graduated scale. Do not touch or in any way disturb the position of the graduated ring until the reading has been taken.
8. Record the reading along with the position of hole and depth.
9. Turn the graduated scale anti-clockwise back to 0 position.
10. To determine the remoulded shear strength, the following procedure is used: Turn the vane quickly at least 25 revolutions. Zero the scale and take at least two measurements by turning the instrument as slowly as possible. The minimum value is considered the correct one.
11. Push the vane down to next position. If necessary, add another extension rod.
12. Repeat the above measurement procedures (3-10).
13. When the last reading is taken pull the vane up. If the clay is comparatively soft, this can be done by hand, gripping the handle. In harder clays, some mechanical device might be necessary. It is then advisable to connect this device directly to the connection rod (not to the instrument).

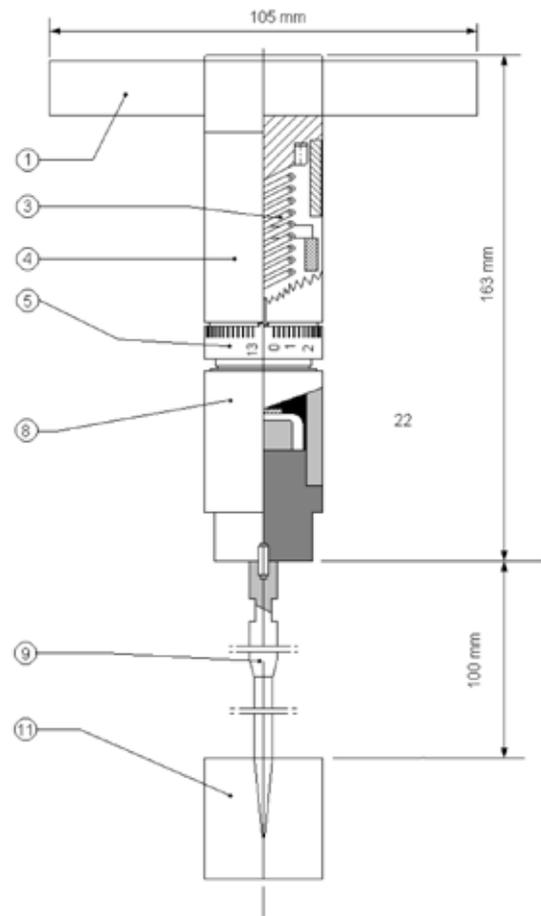
3.2 Special procedure

When measuring shear strength at greater depth, the friction between the clay and the extension rods can be appreciable, and must be taken into consideration.

To measure this friction, extension rods and a vane shaft without vanes (dummy) are pushed into the ground to the depth required for shear force measurements.

The friction is measured in the same way as when using vanes (3-9 in chapter 3.1). The friction value thus obtained is used to evaluate the actual shear strength from the measured shear strength.

To penetrate through firm layers a preboring using a rod with the same diameter as the vane may be helpful.



4. Maintenance

The inspection vane tester is very simply designed and does not require much attention. It is most important that it is kept as clean as possible.

Vane	Reading multiplied by = value in Kpa
16 x 32 mm	2
20 x 40 mm	1
25.4 x 50.8 mm	0.5

Set specifications

Art. no.:	Description	Qty. in set
14.05	Field inspection vane tester, standard set for measurements to 200 kPa (20 t/m ²) and a depth of 3 m, complete with 3 vanes (16 x 32 mm, 20 x 40 mm and 25.4 x 50.8 mm), dummy vane, extension rods, tools and carrying bag	
14.05.01	Field inspection vane tester, standard set for measurements to 200 kPa (20 t/m ²), complete with 3 vanes (16 x 32 mm, 20 x 40 mm and 25.4 x 50.8 mm) and dummy vane, excl. extension rods and carrying bag	1
14.05.02	Extension rod, stainless steel length 50 cm	6
14.05.05	Carrying bag for vane tester	1

Nothing in this publication may be reproduced and/or made public by means of print, photocopy, microfilm or any other means without previous written permission from Eijkelkamp Agrisearch Equipment.

Technical data can be amended without prior notification.

Eijkelkamp Agrisearch Equipment is not responsible for (personal damage due to (improper) use of the product.

Eijkelkamp Agrisearch Equipment is interested in your reactions and remarks about its products and operating instructions.