



ap
van den
berg

Icone Vane

determining the shear strengths for soil stability analysis



features

- modular plug & play extension to the digital Icone data acquisition system
- automatically recognized by Ifield software and Icontrol datalogger
- torque sensor & drive close to the vane for most accurate measurement
- to prevent damage, the motor is electronically limited at a torque of 100 Nm
- available in slow or standard version for very accurate tests or fast remoulding
- an optional robust housing protects the vane through hard layers

PROBE
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FUTURE

Icone Vane, determining the shear strengths for soil stability analysis

Introduction

At locations where the soil is exposed to high and varying forces, for example at a dike or around a mining area, additional parameters for stability analysis should often be measured. Determination of the shear strength is a commonly used method to define soil stability.

A.P. van den Berg's Icone Vane is an excellent instrument for in-situ measurement and evaluation of the shear strength. It can be used in soft soils, but also in fine-grained soils such as silts, organic peat, tailings and other geomaterials where a prediction of the undrained and remoulded shear strength is required.

Measurement method Icone Vane

The Icone Vane consists of four rectangular blades fixed at 90° angles that are pushed into the ground to the desired depth. Once this depth is reached, the blades are rotated at a constant speed. The resistance of the soil, and consequently the required torque, will increase until the soil breaks and shears. From the point the soil is shearing, the torque value will naturally decrease. The highest measured value, in other words the required torque for shearing of the soil, is a measure for the undrained shear strength. After this first test, the soil is thoroughly remoulded by rotating the vane at a high speed. Then the test is repeated and this will provide a uniform curve with lower values. The highest value in this curve is a measure of the remoulded shear strength. The Icone Vane is available with various blade sizes. Size selection depends on the stiffness of the soil in order to perform an accurate measurement.

Accuracy assured

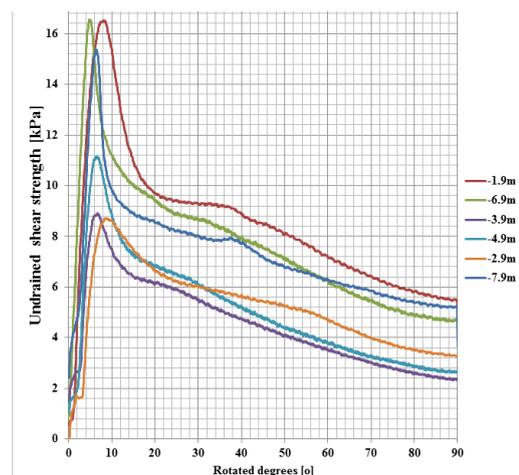
A.P. van den Berg's Icone Vane has many features that lead to an accurate vane test. The torque sensor and drive are positioned inside the tool itself, so as close as possible to the vane for the most accurate measurement. With this innovation there is no need to rotate the full CPT string anymore. This enables easy and fast operation. Depending on the soil type vane tests can be performed in pre-drilled holes or the vane tester can be pushed into the soil directly. For the latter we have an optional protection housing, to allow more tests at different depths without the need for retrieving the tool. To prevent damage to the transmission, the drive motor is electronically limited at a torque of 100 Nm. We have two versions available: the "slow version" for very accurate shear tests (speeds from 0.1 - 6 °/s) and the "standard version" for fast remoulding

(speeds from 0.2 - 12 °/s). The Icone Vane can be used for onshore as well as offshore applications and has a 4,000 m water depth rating.

Specifications	
Length	-unprotected 1,120 mm -with protection tube 1,500 mm
Diameter	-unprotected 65 mm -with protection tube 90 mm
Weight	14.6 kg (complete tool)
Vane rotation speed range	-slow type 0.1 to 6°/s -standard type 0.2 to 12°/s
Optional blade sizes	-height between 60 & 150 mm -diameter between 30 & 75 mm -thickness standard 2 mm
Torque	-measuring range 0-100 Nm -accuracy 0.5% (FRO)
Inclinometer	-measuring range 0° - 20° -accuracy 0.5° (FRO)
Data transfer	-4 wire Icone cable inside rods
Connector	- subconn. 4-pins on module - Lemo 4-pins to Icontrol
Operating temperature	0° to 60°C

Fully digital data transfer

The Icone Vane is part of the modular Icone data acquisition concept, developed by A.P. van den Berg, that is based on fully digital data transfer. The system consists of a digital data logger, called Icontrol and the Ifield software for real-time data presentation. Besides the Icone for standard CPT and the Icone Vane, modules are available for seismic, magneto and conductivity testing. Upon connection, the Icontrol data logger and Ifield software will automatically recognize the specific cone and/or module(s), so plug & play!



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