ATAGO®

'Pocket'
Soil Moisture Meter

PAL-Soil
Cat. No.4571

Measurement method in accordance with ISO 16586:2003 "Soil quality – Determination of soil water content as a volume fraction on the basis of known dry bulk density – Gravimetric."

Construction

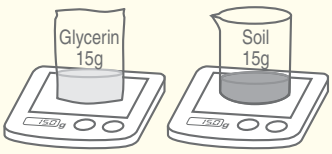
Irrigation

Save on time, labor, and material with PAL-Soil.

A measurement only takes 10 minutes whether out in the fields or in the lab.

Measurement Method

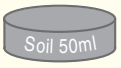
1 Gravimetric Measurement



Measure out an equal amount each of soil and glycerin.

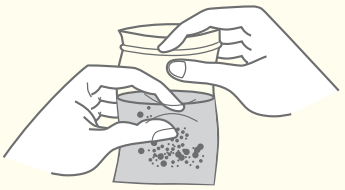
Volumetric Measurement

(1) Measure out 50ml of soil, using a sand-pouring cylinder or soil sampler.



(2) Measure out 30ml of glycerin and place it in a re-sealable plastic bag.

2



Mix the soil and glycerin thoroughly.

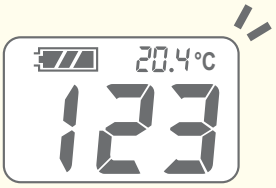
3

Place filter paper on the prism and place the soil-glycerin mixture on top.

4

Press the START key.

5



Measurement value is displayed in 3 seconds.

Commentary

What is gravimetric soil moisture?

As defined by ISO 16586:2003, soil quality is the water content % of soil expressed by mass (weight). It is the mass of water relative to the mass of oven-dried soil. Soil is dried in an 110˚C±5˚C oven.

*This measurement method was developed by Professor Wada at Kyushu University and has proven to have a strong correlation with ISO 16586:2003.

$$w = \frac{Ma-Mb}{Mb} \times 100$$

- w = Gravimetric soil moisture (%)
- Mb = Mass of soil after drying in the oven
- Ma = Mass of soil before drying in the oven
- Ma-Mb = Mass of water in soil

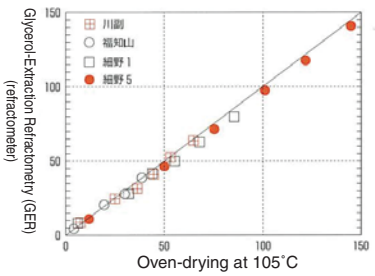
What is volumetric soil moisture?

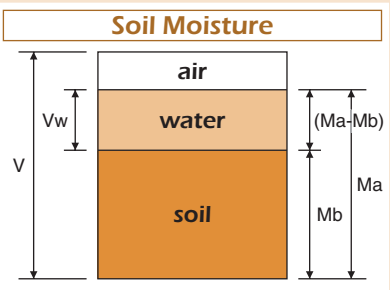
It is the water content % of soil expressed by volume. It is the volume of water relative to the total volume of a soil sample. A sand-pouring cylinder is commonly used.
The PAL-Soil calculates the water content of soil by measuring a decline in the refractive index of glycerin after it is mixed with water at the 5:3 ratios. It utilizes the water-absorbing properties of glycerin.

$$\theta = \frac{Vw}{V} \times 100$$

- θ = Volumetric soil moisture (%)
- V = Total volume of soil sample
- Vw = Volume of water

Comparison between refractometers and oven-dry method for determination of gravimetric water content (%) of soil





Specifications

Measurement range	• Gravimetric soil moisture: 0 to 200% (Automatic Temperature Compensation) • Volumetric soil moisture: 0 to 100% • Temperature: 10.0 to 40.0˚C		
Resolution	• Gravimetric soil moisture:1% • Volumetric soil moisture: 1% • Temperature: 0.1˚C		
Measurement accuracy	• Gravimetric soil moisture: ±2% (0 to 40%), ±5% (41 to 100%) • Volumetric soil moisture (Repeatability): ±1% (0 to 60%), ±2% (61 to 100%) • Temperature: ±1˚C		
Measurement temperature	10 to 40˚C	Power supply	AAA alkaline battery × 2
Ambient temperature	10 to 40˚C	Battery life	About 11,000 measurements (when an alkaline battery is used)
Option	Pocketable Scale	Accessories	• AAA alkaline batteries • Filter paper • Re-sealable plastic storage bags • Beaker • Plastic tweezers • Plastic spoon
International Protection class	IP65 Water Resistant		
Dimensions and weight	55(W)×31(D)×109(H)mm 100g		

*Purchase a premium quality glycerin reagent from a local pharmacy or reagent store.

Always clean and shiny - can be cleaned under running water.

All ATAGO refractometers are designed and manufactured in Japan.

ATAGO CO.,LTD.

HACCP GMP GLP ATAGO products comply with HACCP, GMP, and GLP standards.

V.02 12070000PP Printed in Japan

novatech INTERNATIONAL

sales@novatech-usa.com
www.novatech-usa.com
Tel: (866) 433-6682 Fax: (866) 433-6684
Tel: (281) 359-8538 Fax: (281) 359-0084