



Compact, Portable

Measures water content of roadbed material in the field

Overview

The DOT600 is a stand-alone product that measures volumetric and gravimetric water content of samples of earthen material in roadbeds and foundations. Portability, along with quick and accu-

rate measurements, make it a valuable tool for evaluating roadbed material both at the construction site and in the soil-test lab.

Benefits and Features

- › Measures water content, bulk density and compaction force, and volume and weight of soil samples
- › Integrated datalogger for quick results
- › High accuracy and high precision
- › Includes a rugged case and is completely portable
- › Generates a measurement report that can be easily imported into spreadsheets

Technical Description

The DOT600 includes a sample chamber, CR850 datalogger, PC200W software, wall charger, and a rugged case. Samples collected from laboratory or field sites are placed in the chamber and compacted to a chosen pressure (15 to 45 psi). The water content is then calculated using dielectric permittivity sensitive

methods. A separate scale and magnetic linear sensors measure the sample volume. The CR850 then calculates of bulk density, converts the measured volumetric water content to gravimetric water content, and stores the measurement results in a data table for permanent record.

Standard Equipment

- › CR850 datalogger
- › Wall transformer with cable and connector to charge DOT600 from ac power source)
- › Sample chamber base
- › Sample chamber cylinder
- › Ratcheting box-end wrench
- › Compression cap
- › Sieve, 4 mesh
- › DOT600 operating manual
- › RS-232 serial cable
- › PC200W software



Ordering Information

Roadbed Water Content Meter

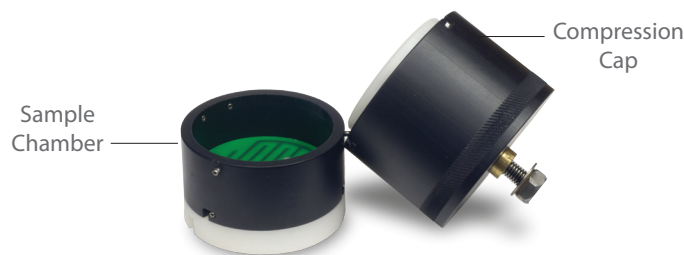
DOT600 Roadbed water content system

Optional Equipment

CR1000KD Keyboard/Display for situations in which an external keyboard display is useful.

SC32B Adjustable Angle Mounting Kit, Extended Length

CM220 Right Angle Mounting Kit



Soil is placed in the sample chamber and compacted to a chosen pressure by using the compression cap.

Water Content Measurement Accuracy/Calibration

Accuracy is defined by comparing DOT600 measured water contents to independently determined values. The independent method is water content by gravimetric method (weighing wet and after oven drying).

The DOT600 water content measurement uses a calibration to convert sensor output period to volumetric water content. This calibration was derived at the factory based on different types of soil. The calibration coefficients will be determined by the Matrl type selected. Repeated measurements on the sandy loam soil

over the water content range from air dry to about 70% saturation show deviations from independent measurements of less than $\pm 1.5\%$ volumetric water content.

Since the gravimetric water content measurement uses sample volume and weight to convert from measured volumetric water content, the accuracy of the gravimetric water content will be less than the volumetric value because of inherent errors of the volume and weight measurements.

Specifications^a

- › Case Outside Dimensions: 55.9 x 43.2 x 21.6 cm (22 x 17 x 8.5 in)
- › Shipping Weight: 10.64 kg (23.45 lb)

Battery

- › Type: 2.9 Ahr rechargeable sealed lead-acid
- › Standby Charge Retention at 20°C for One Year: 95%
- › Lifetime: ~500 cycles with discharge to 50% followed by recharge

Scale^b

- › Capacity: 1000 g (35.3 oz)
- › Accuracy: ± 0.05 g (± 0.002 oz)
- › Repeatability: 0.02% FS

Water Content Measurement

- › Resolution^c: 1% volumetric water content
- › Precision^d: 0.75% volumetric water content

Sample Volume and Applied Force Measurement

- › Sample Volume: $\pm 1.5\%$ for compressed sampled with thickness between 1.0 cm (0.4 in) to 2.54 cm (1.0 in)
- › Sensitive Volume: electromagnetic field penetrates the sample 1 cm (0.39 in). Sensitive volume is about 57.4 cm³ (3.5 in³).
- › Applied Pressure Range: 0 to 45 psi
- › Applied Pressure Measurement Accuracy: 1.7 psi

^a Datalogger specifications are provided on the CR800-Series Datalogger Brochure.

^b The scale has overload protection in both the up and down directions during shipping. But it only has overload protection in the down direction during use.

^c Resolution is the minimum change in the measured parameter, water content, that the sensor can repeatedly detect.

^d Precision is the expected range for repeated measurements on the same sample.