

Troxler EGauge™ Model 4590 Soil Density Gauge

Product News

October 2018



Troxler Electronic Laboratories, Inc., the Industry Leader in Nuclear Density Gauges, Announces the EGauge Meets the Requirements of ASTM D8167

ASTM D8167

In June 2018, ASTM International (ASTM) released a new standard, ASTM D8167 (“Standard Test Method for In-Place Bulk Density of Soil and Soil-Aggregate by a Low-Activity Nuclear Method [Shallow Depth]”). It establishes procedures for measuring the density of soil and soil-aggregate materials using nuclear equipment with a radioactive source. The device described in this method differs from the gauges described in ASTM D6938 (“Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods [Shallow Depth]”) in that it does not contain a system to determine the water content of the material.

ASTM D8167 provides independent repeatability and reproducibility data for the EGauge, which is described in detail in ASTM research report RR:D18-1024 and illustrates the precision of measurements made by the gauge. (It was collected by ten technicians from several agencies who operated ten EGauges as part of an interlaboratory study.) This data is comparable to the data shown in ASTM D6938, which was collected in a similar manner using higher-activity nuclear density gauges. The following tables provide a comparison of the two sets of results for different density values.

EGauge and Model 3440-Type Gauge Comparison—Material 1

Soil Density = Approximately 120–121

| | Low-Activity Source EGauge | Model 3440-Type Gauge |
|------------------------------------|----------------------------|-------------------------|
| Repeatability Standard Deviation | 0.3 lb/ft ³ | 0.27 lb/ft ³ |
| Reproducibility Standard Deviation | 0.6 lb/ft ³ | 0.68 lb/ft ³ |
| Repeatability Limit | 0.8 lb/ft ³ | 0.74 lb/ft ³ |
| Reproducibility Limit | 1.8 lb/ft ³ | 1.91 lb/ft ³ |

EGauge and Model 3440-Type Gauge Comparison—Material 2

Soil Density = Approximately 130.1–138.9

| | Low-Activity Source EGauge | Model 3440-Type Gauge |
|------------------------------------|----------------------------|-------------------------|
| Repeatability Standard Deviation | 0.4 lb/ft ³ | 0.46 lb/ft ³ |
| Reproducibility Standard Deviation | 0.8 lb/ft ³ | 0.77 lb/ft ³ |
| Repeatability Limit | 1.2 lb/ft ³ | 1.28 lb/ft ³ |
| Reproducibility Limit | 2.2 lb/ft ³ | 2.15 lb/ft ³ |

In addition, EGauge density testing data was collected and analyzed over a three-year period in an uncontrolled field evaluation, during which Troxler customers compared the gauge’s results with those they received using a Troxler Model 3440 Moisture Density Gauge. The EGauge density measurement results were proven to be comparable to those from Troxler nuclear density gauges that have been

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accepted by the industry for over fifty years. As ASTM D8167 is adopted, this will allow contractors and engineering firms to use it for projects that list the standard as an approved ASTM standard for their soil density quality control measurements.

Exempt from Licensing

The EGauge uses proven nuclear density measurement technology for bulk (wet) density measurements. It contains a sensitive detector paired with a low-activity gamma source that is approximately 100 times less active than the source in the Model 3400 series nuclear density gauges. Because of this and its built-in safety features, the EGauge is **exempt** from radioactive materials licensing requirements in the United States by the US Nuclear Regulatory Commission (NRC).

This exemption saves the owner time and money. The EGauge delivers precision soil density measurements while eliminating license fees and the need for operator radiation safety training, regulatory shipping paperwork, reciprocity for out-of-state use, and monitoring badges.

Innovative Features

The EGauge can be used to measure bulk (wet) density of soils with thicknesses up to 8 inches (200 millimeters) in depth. Water content and dry density measurements are not included in this test method; however, the gauge displays a dry density reading when used with an external moisture measurement system, such as the Troxler Model 6760 Moisture Probe with *Bluetooth*[®] wireless communications.

The features of the EGauge demonstrate Troxler's commitment to excellence in product innovation.

- An enlarged liquid crystal display (LCD) with backlighting makes results easy to read.
- Automatic Depth mode detects the rod depth during each measurement.
- The gauge stores up to 1,000 measurements under multiple projects for future printing, viewing and downloading.
- A USB port provides the ability to download stored data to a flash drive or a USB printer.
- Built-in Bluetooth technology enables the probe to transfer data directly to the gauge.
- The GaugeReader™ app (available through the Google Play™ store) allows the operator to upload project data to any Android™ device.
- The Auto-Store function automatically stores sample data under the active project.
- A GPS location feature records the gauge location with each measurement.
- Operation of the EGauge is similar to that of existing nuclear density gauges, which allows an experienced operator to use it without additional training.

About Us

Since 1958, Troxler has been the worldwide leader in precision quality control and measurement equipment and instrumentation for the highway and construction industries. We are dedicated to providing premier service, maintenance, and training for all our products through our worldwide sales and support offices in the United States, Canada, China, and Germany and over forty distributors around the world.

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