

Measurement by Nuclear Density

Lab Test Reference

606

Test Method Reference

Manufacturers Instructions

Principal Apparatus:

Humboldt Nuclear Density Gauge - Lab. Invent No. xxx

1. Preliminaries

- 1.1 The following calibration procedure should be made in the laboratory before the gauge is taken out to site.
- 1.2 The TEST key checks the operation of the processor and displays. Pressing it at any time will display all segments of the displays for about 1 to 2 seconds with the exception of the "LOW BAT" Symbol which is displayed only during a low battery condition. At the end of the period, the "DEPTH" display will be blank and the "DATA" display will indicate the gauge serial number. Pressing any other key will restore operation of the displays.
- 1.3 A standard count must be taken each time the gauge is used and this compared with previous readings. The gauge is positioned on the reference polythene block away from interference and for convenience on top of the carriage case, with the base seated in the recess on top of the block. The source rod end of the gauge should be over the handle end of the standard and the end of the gauge firmly pressed against the top of the handle which serves as a stop. The source rod handle must be in the safe (top) position and the indexer latched.
- 1.4 When power is first applied to the gauge, the "STD" counts from the prior use are still retained in the memory. These counts should be replaced each working day. If the gauge is switched off during a working day, either intentionally or accidentally, it is not necessary to take a new set.
- 1.5 The values of the MOISTURE and DENSITY STANDARD COUNTS should be recorded in a log book to provide a history over long periods of time in order to determine the need for service. If there is a sudden or rapid change in a few days or weeks, it is an indication of a malfunction in the system. As a rule if a STANDARD COUNT has changed by more than the square root of the average of the last four STANDARD COUNTS there is a possible malfunction.
- 1.6 Ensure that the appropriate radiation signs are attached to the vehicle before setting off, and that the fireproof sign is on the dashboard.
- 1.7 Confirm that your radiation protection badges are firmly attached to your waist.
- 1.8 Sign out in the office log book to indicate the destination of the gauge.
- 1.9 Ensure the vehicle contains a copy of the "local rules" i.e. operating instructions including emergency procedures.
- 1.10 Make sure the radiation monitor is also taken.

1.11 4 no. traffic cones should be taken, complete with adhesive trefoil for use in an emergency.

1.12 Bucket of sand for use in an emergency.

2. Standard Test Method

Backscatter Method

2.1 The surface to be tested is first inspected to ensure it is free from moisture and detritus. If the surface is open textured a small amount of dry sand is applied to fill the surface voids.

2.2 The gauge is placed on the surface and the target theoretical or refusal density entered into the memory appropriate to the material being tested.

2.3 The probe is lowered onto the surface and set to count for one minute or less if required. After this time has elapsed the probe is locked into the safe position and the reading on the gauge noted.

2.4 This process is repeated by turning the gauge 180° and re-measuring the density. If required an extra reading can be taken by placing the gauge at 120° positions at the same location.

Direct Transmission Method

2.5 Using the spike and hammers an accurate hole is produced in the granular material to the depth at which measurements are taken.

2.6 The gauge is placed over the hole such that the probe can be lowered into it and measurements are taken as described above.