ALDOT-378-92
ACCEPTING NEW NUCLEAR MOISTURE/DENSITY AND THIN LAYER GAUGES, AND RECALIBRATING/QUALITY CHECKING USED GAUGES

1. Scope

1.1. This method covers the procedures for the acceptance of new Nuclear Moisture/Density and Thin Layer Gauges and the recalibration and quality check of older gauges.

2. Applicable Documents

2.1. Manufacturers operating instruction manuals.

2.2. Materials and Tests-14 and -33 Specifications.

3. Apparatus

3.1. Standard density calibration blocks and standard moisture block.

Section A

4. Procedures for Acceptance of New Gauges

4.1. Using manufacturers' recommendations, establish a standard count for density and moisture.

4.2. Standard counts should be verified as being in acceptable tolerances utilizing ALDOT-222 Section 6, or a built-in calculation contained in the gauge software.

4.3. Density aspects of the gauge operated in normal mode are verified by taking one minute counts at each interval (BS thru 8 in. (200mm)) on a known standard mag/alum block of 150 lbs/ft^3 (2140 kg/m^3). Tolerances shall be within ± 1.5 percent of the known block density.

4.4. Moisture aspects of the gauge shall be determined by taking two one-minute counts and average. Counts are taken on a mag/poly block. This block simulates 40 lbs/ft^3 (628 kg/m^3) of moisture. The gauge must count within ± 2 lbs/ft^3 (32 kg/m^3) of the known 40 lbs/ft^3 (628 kg/m^3) of moisture.

4.5. Thin Layer aspects of the gauge are verified by taking ten one-minute calibration counts taken in the backscatter position. These counts are taken on a 1 in. (25 mm) thick mag/alum plate, placed on the mag/alum standard block. These counts are averaged and the difference is calculated between the gauge readings and the known mag/alum plate density of 133.5 lbs/ft^3 (2140 kg/m^3). This difference is utilized as a D-Bias/OFFSET entered into the gauge software to calibrate the gauge. With the gauge calibrated, four one-minute counts are taken under the same conditions that the calibration counts were taken. The counts are averaged and shall be within ± 1.5% of the 133.5 lbs/ft^3 (2140 kg/m^3).

4.6. When the requirements of the above procedures have been met, the gauge will be accepted for use on Alabama Department of Transportation construction projects.

Section B

5. Recalibration and Quality Check of Used Gauges

5.1. Gauges designed for Thin Layer Asphalt Density determinations only (Troxler 4640-A & 4640-B) shall be recalibrated according to the following procedures. The gauge shall be calibrated using the 3-block calibration procedure obtained from Troxler Electronic Labs, Inc. The data is accumulated, then entered into the computer program supplied by Troxler. This program generates calibration constants and gauge parameters to be manually input into the gauge. Once the gauge has been calibrated, procedure 4.5 (Section A) is utilized to verify and check the recalibration.

5.2. Moisture/Density and Dual Purpose gauges shall be recalibrated according to the calibration procedures used by Campbell-Pacific Nuclear Corp. This procedure has proven to be acceptable and reliable for Troxler and CPN gauges. These procedures consist of collecting count data on Magnesium, Aluminum, Mag/Alum and Mag/Poly Standard blocks. Four minute counts are taken at each interval and the data processed through the computer program supplied by Campbell-Pacific. This program generates calibration constants used to calibrate the gauge. Once the gauge has been calibrated, procedures of Section A, 4.3, 4.4, and if applicable, 4.5 are followed to establish a quality check of the recalibration.