

Australian Standard[®]

Methods of testing soils for engineering purposes

Method 5.8.1: Soil compaction and density tests—Determination of field density and field moisture content of a soil using a nuclear surface moisture–Density gauge—Direct transmission mode

AS 1289.5.8.1—2007

1 SCOPE

This Standard sets out the method for determining the field density of a soil using a nuclear surface moisture-density gauge in the direct transmission mode of operation. It describes the method for determining the field moisture content of a soil using the same device, but other methods of moisture content determination may also be used. Gauges determine the gross mass per unit volume (field wet density) of the soil and the mass of water per unit volume (field water content) of the soil. Field dry density and moisture content can be calculated from these values.

This method is applicable to soils having not more than 20% by mass of particles retained on the 37.5 mm sieve. Some soils containing variable percentages of chemically bound water or other neutron moderators or absorbers may require the moisture content of the material to be determined in accordance with AS 1289.2.1.1 or one of the subsidiary methods, AS 1289.2.1.2, AS 1289.2.1.4, AS 1289.2.1.5 or AS 1289.2.1.6.

Because of the variety of gauges available, this method does not detail the operation of the gauge but refers the operator to the manufacturer's handbook.

When nuclear gauges are used for density or moisture measurement, the volume of material being assessed is not precisely known; however, reference to the manufacturer's handbook and current literature may indicate the likely volume. The zone of influence for the nuclear moisture function of a gauge is normally restricted to less than 150 mm below the base of the gauge.

A nuclear gauge gives an indirect measure of field density and field moisture content and hence requires calibration in accordance with AS 1289.5.8.4. Regular checks on the operation and the calibration of the gauge are also required (see Clause 5). When the moisture content is measured using the gauge, the intercept of the moisture calibration equation needs to be determined for each material being tested.