

# CLEGG IMPACT SOIL TESTER

## Model GTM-SS-E2

4.5 kg or 2.25 kg Versions Shown  
(details may vary)



Features: Clear Anodised Aluminium Guide Tube, Aluminium-Clad Plywood Shipping Case, Stainless Steel T-Handle, Stainless Steel Hammer Weight for 4.5 kg Version or Red Anodised Aluminium Hammer Weight for 2.25 kg Version.

The Clegg Impact Soil Tester, also known as the Clegg Hammer, is a simple to use device consisting of two basic components: a flat-ended cylindrical mass and a guide tube. The mass, i.e. the hammer, is manually dropped from a predetermined height. Five basic hammer masses are available: 4.5 kg (the "Standard Clegg Hammer"), 2.25 kg (the "Medium Clegg Hammer"), 0.5 kg (the "Light Clegg Hammer"), 9.1 kg (the "Medium Heavy Clegg Hammer") and 20 kg (the "Heavy Clegg Hammer"). Hammer diameter for the three lightest versions is 5 cm whilst it is 13 cm for the heavier versions. The set height of drop for the Standard and Medium Clegg Hammers is 45 cm. For the others, it is 30 cm. (61 cm capability for the 9.1 kg version to meet ASTM F1936, with the ability to convert to a 10 kg version – the "Heavy Medium Heavy Clegg Hammer" - in line with the recommendations in the 2006 *Final Report* prepared for the US EPA Radiation Protection Division entitled "Modification of the Clegg Hammer as an Alternative to Nuclear Density Gauge to Determine Soil Compaction".)

The 4.5 kg CIST is the "general purpose" Clegg Hammer for roadworks, earthworks, airstrips, etc. The two lighter Hammers are used primarily for turf or sand testing, with the 2.25 kg version also suitable for earthworks compaction testing. The Heavy Clegg Hammer was developed for testing on the top of the running course of flexible pavements. Because of the larger size and weight of the 13 cm diameter Clegg Hammers, the guide tube is set on wheels with a pull handle to ease moving on site.

The output is based on the peak deceleration of the hammer's impact with the surface in units of tens of *gravities* (clegg units,  $C_{max}$  or Cm), with the output seen, along with a drop-counter, on the LCD of a digital readout unit fastened to the guide tube. Four successive drops of the hammer on the same spot constitute one test, called a Clegg Impact Test (CIT). The CIT provides a soil strength/stiffness - or "hardness" - parameter known commonly as Clegg Impact Value (CIV), also known as Impact Value (IV) - (refer to AS 1289.6.9.1 and ASTM D5874) - and notation is as CIV, CIV/M, CIV/L, CIV/MH (or CIV/HMH) and CIV/H for the "Standard", "Medium", "Light", "Medium Heavy" (or "Heavy Medium Heavy") and "Heavy" Clegg Hammers.

The Clegg Impact Soil Tester is used worldwide by road authorities, local governments, consulting engineers, contractors, construction & mining companies, testing laboratories, universities, research institutes, the military, turf consultants, etc.

**For Pavement Design-** The 4.5 kg Clegg Hammer output parameter is similar in concept to the California Bearing Ratio (CBR) and may be used as an alternative to CBR in both laboratory and field on unsoaked samples without surcharge. The Clegg Hammer output may be converted to a Clegg Hammer Modulus (CHM), analogous to an elastic modulus. (The 2.25 kg Medium Clegg Hammer has also been correlated to-date to CBR for values of less than 50%)

**For Construction-** The Clegg Hammer provides a means of process control by monitoring the effect of roller passes and checking variability. Percent compaction may be estimated by determining the Clegg value (termed an "As Compacted Target Strength") needed to achieve the desired density level for the given material, compaction equipment and determined compaction moisture condition.

**For Evaluation-** The 4.5 kg Clegg Hammer may be used to ensure adequate base course strength before sealing or proceeding with subsequent layers. It may also be used to monitor the effect of environmental changes and to investigate pavement failures. Statistical concepts can be applied to assess uniformity. Assessment of *in situ* conditions is also possible.

**Low Cost-** A Clegg Impact Test requires only one person and less than half a minute to perform. The output is displayed directly on the Clegg Hammer's digital readout unit upon completion of the test. The Clegg Impact Test can be performed by the supervisor himself or by the man on the job. Sensible application at the time of construction can reduce the risk of costly overworking or reworking.

**Information-** Information is available in the form of Papers, Reports, Technical Notes, Newsletters, etc. covering the theoretical basis, applications and correlation with other soil property tests such as "Proctor Density", Texas Class Number (TCN), Benkelman Beam, California Bearing Ratio (CBR), Falling Weight Deflectometer (FWD) and Elastic Modulus.