

SOIL CLASSIFICATION AND COMPACTION

A/ INTRODUCTION

- 1/ Participants are invited to perform tests as the majority of **routinely tested** sample.
- 2/ For each test performed please report the result of a single determination only, not the average of two or more, except in cases where an average is called for in the method or specification.
- 3/ Ultimately, though, it is the responsibility of the participating laboratories to avoid **collusion or falsification** of results. Laboratories found to be **falsifying** results may be refused participation in subsequent proficiency tests.
- 4/ to permit an estimate of single-operator precision, the same operator should conduct tests. Treat each sample as you would treat a typical "testing" sample. Any special handling or preparation needs will be included below or within the Sample Instructions Document.
- 5/ all tests should be conducted according to **ASTM Standard** Test Methods indicated.

B/ PROFICIENCY TESTING PLAN

SAMPLE	ROUND
PARTICLE-SIZE ANALYSIS OF SOILS	ASTM D 422
LIQUID LIMIT, PLASTIC LIMIT, AND PLASTICITY INDEX OF SOILS	ASTM D4318
SPECIFIC GRAVITY OF SOIL SOLIDS BY WATER PYCNOMETER	ASTM D854
LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING MODIFIED EFFORT (2,700 KN-M/M3)	ASTM D1557

The **_ SOIL** Proficiency Samples are currently being processed. Please take note of the following dates and deadlines associated with these samples:

➤ Shipping Date:

Immediately after the shipping date, **PTTn** will send email informing you the track shipment number. Upon receipt of the samples, please open the boxes and ensure that all contents are included.

The outside of the sample box is labeled samples

Datasheets and instructions will be communicated to participants by email.

➤ Non-Receipt Date:

If you have not received the samples by the non-receipt date or If the samples are seriously damaged or missing a component, please notify us immediately; through email at info@pt-tn.com ; and we will send replacements.

➤ **Closing Date:**

We encourage you to submit your results by email at info@pt-tn.com , as soon as possible. This enables you to receive instant confirmation of data submitted and revise data if needed. Test results received after the closing date will not be included in the final report.

➤ **Final Report Date:**

PTTn will provide a final report approximately two weeks after the closing date.

PT reports will be provided by email. Laboratories will be notified by email when the final report becomes available.

C/CONFIDENTIALITY

Of course, **confidentiality** of individual laboratory results will be maintained. However, general information regarding the round of testing, such as statistical summary tables and z-score associated with the analysis of data.

D/ INSTRUCTIONS

➤ **Particle Size Analysis of Soils D422-(2007):**

- Determine the hygroscopic moisture and perform the sieve and hydrometer analysis. Report the sieve and hydrometer analysis as a percent passing. Report the results to the **nearest 0.1 percent**.
- The distribution of particle sizes larger than 75 µm (retained on the No. 200 sieve) is determined by sieving, while the distribution of particle sizes smaller than 75 µm is determined by a sedimentation process, using a hydrometer.
- ASTM hydrometer, graduated to read in either specific gravity of the suspension or grams per litre of suspension, and conforming to the requirements for hydrometers **151H or 152H** in Specifications.
- **Dispersing Agent** solution of sodium hexametaphosphate (sometimes called sodium metaphosphate) shall be used in distilled or demineralized water, at the rate of **40 g** of sodium hexametaphosphate/litre of solution
- The basic temperature for the hydrometer test is 68°F (**20°C**).
- Prepare **1000 mL** of liquid composed of distilled or demineralized water and dispersing agent in the same proportion as will prevail in the sedimentation (hydrometer) test.
- The soil is mostly of the clay and silt sizes, weigh out a sample of air-dry soil of approximately **50 g**.

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- Place the sample in the **250-mL** beaker and cover with **125 mL** of sodium hexametaphosphate solution (40 g/L). Stir until the soil is thoroughly wetted. Allow to **soak** for at least **16h**.
- At the end of the **soaking** period, disperse the sample further, using either stirring apparatus.
- Immediately after dispersion, transfer the soil-water slurry to the glass sedimentation cylinder, and add distilled or demineralized water until the total volume is 1000 mL.
- Turn the cylinder upside down and back for a period of 1 min to complete the agitation of the slurry. At the end of **1 min** set the cylinder in a convenient location and take hydrometer readings at the following intervals of time.

Liquid Limit of Soils D4318-(2017):

- Preparing test specimens as procedure 2 **Dry** Preparation. So dry the specimen in an oven at a temperature not exceeding **60°C** until the soil clods will pulverize readily,
- Determine the liquid limit by **Method A** (multipoint method).
- Plastic Limit Rolling Procedure (Using the **Rolling Device**).
- Determine the liquid limit and plastic limit and report the results to the **nearest 0.1 percent**. *Do not report the plasticity index*. If the material is determined to be non-plastic, leave the space blank on the data sheet.
- Please to use apparatus as defined in standard.

➤ **Specific Gravity of Soils D854-14:**

- Determine the specific gravity of material passing the 2.00-mm (No. 10) sieve. Oven dry the soil in accordance with Section 9.3 (D854) **method B** and determine the specific gravity based on water at **20°C**. Report the results to the **nearest 0.001** specific gravity unit.
- Dry the sample to a constant mass in an oven at **110 ± 5°C (method B)**.
- Determine and record the weight of the empty clean and dry pycnometer
- Place appropriate weight of a dry soil sample (passed through the sieve No. 10) in the pycnometer. Determine and record the weight of the pycnometer containing the dry soil.
- Add distilled water to fill about half to three-fourth of the pycnometer.
- Heat or vacuum at **2 hours** duration with continuous agitation.
- Cool the specimen pycnometer at room temperature.
- Fill the pycnometer with distilled water to the mark; clean the exterior surface of the pycnometer. Determine the weight of the pycnometer and contents.

- Empty the pycnometer and clean it. Then fill it with distilled water only to the mark. Clean the exterior surface of the pycnometer. Determine the weight of the pycnometer and distilled water.
- **Moisture-Density of Soils (Modified Effort) Using a 4.54-kg (10-lb) Rammer, D1557-(2012):**
 - Determine the moisture-density relations using a **101.6-mm (4-in.)** diameter mold (**ASTM Method A**). Report the optimum moisture content to the **nearest 0.1 percent** and report the maximum dry density to the **nearest 0.1 lb/ft³**.
 - Mold—4-in. (101.6-mm) diameter.
 - Material—Passing No. 4 (4.75-mm) sieve.
 - Layers—Five.
 - Blows per Layer—25.
 - Drying the sample in temperature does not exceed 140°F (60°C).
 - Select molding water contents for the rest of the subspecimens to provide at least two subspecimens wet and two subspecimens dry of optimum, and molding water contents varying by about 2 %.
 - Compact each layer by 25 blow **uniformly** distributed blows of a 10lbf rammer dropping free from a height of **457.2 mm**

(Note: performing D1557, the material can be reused if there is not sufficient soil to prepare a separate sample at each trial moisture content. After each compaction, take a moisture content specimen and thoroughly break up the remainder of the compacted soil into particles small enough to pass a 4.75-mm (No. 4) sieve as judged by eye and proceed by adding the next water increment. Mix each water increment thoroughly with the soil sample prior to compaction.)

For more details please contact **PTTn** at info@pt-tn.com

Sincerely,

PTTn Proficiency Testing Tunisia