

GDT 51

A. Scope

For a complete list of GDTs, see the Table of Contents.

Use this test method to determine the degree of pulverization in a soil mortar.

B. Apparatus

The apparatus consists of the following:

1. Balance: Use balances or scales that are sensitive to within 0.1 percent of the weight of the sample to be tested. The balances and scales must be able to weigh the required test sample accurately.
2. Sieves: Mount the sieves with square openings on substantial frames constructed to prevent material loss during sieving. Select suitable sieve sizes to furnish the information required by the specifications covering the material to be tested. The sieves must conform to the "Standard Specifications for Sieves for Testing Purposes," AASHTO M 92.
3. Drying Device: Use a stove or oven capable of maintaining a uniform temperature of 230 °F (110 °C).
4. Sieve Shaker: Use a Gilson shaker to mechanically agitate the sieves when separating the soil (WS-09).

C. Sample Size and Preparation

1. Take a representative sample of the material to be tested before it is introduced into the mixer. Ensure you take enough to have a dry weight of at least 15 lbs (6.8 kg).
2. Take the sample so it best represents the condition of the soil.

D. Procedures

1. Be careful not to pulverize any of the material in the sample.
2. Dry the sample at approximately 230 °F (110 °C) until the material is reasonably free of moisture.
 - a. If you cannot find a drying device capable of drying the sample at this temperature without overheating the material, gently stir the sample so no clay balls are broken yet the material dries uniformly.
3. Weigh and record the dry weight of sample as the total weight of sample.
4. Shake the sample over the required sieves until all the pulverized soil has passed the sieves. Do not shake the sample any longer than necessary because extended sifting will break down some of the clay balls.
5. Weigh the unpulverized soil, exclusive of any stone or gravel.
 - a. Start with the largest required sieve and record the weight as the weight retained.
 - b. Add the material retained on each subsequent sieve to the previously weighed material.
 - c. Weigh the mixed sample and record as the accumulated weight retained.

E. Calculations

1. Calculate the percent of unpulverized soil as follows:

$$\% \text{ Passing} = \frac{100 - W_r}{W_t} \times 100$$

where:

W_r = Weight retained on sieve

W_t = Weight of total sample

2. For example:

Total weight of dry sample = 18 lbs

Weight retained on 2-inch sieve = 0 lbs

Weight retained on No. 4 sieve = 2 lbs

Total weight of dry sample = 8.2 kg

Weight retained on 50 mm sieve = 0 kg

Weight retained on 4.75 sieve = 0.9 kg

$$\% \text{ Passing 2 in (50.8 mm) sieve} = \frac{100 - 0.0 \text{ lbs (0.0 kg)}}{18 \text{ lbs (8.16 kg)}} \times 100 = 100\%$$

$$\% \text{ Passing No. 4 (4.75 mm) sieve} = \frac{100 - 2.0 \text{ lbs (0.91 kg)}}{18 \text{ lbs (8.16 kg)}} \times 100 = 88.9\%$$

F. Report

1. Report the accumulative percentage passing each sieve required by the Standard Specifications for the material being produced.
 - d. If the material is mixed in place, report the percent on Form 495.
 - e. If the material is mixed at the plant, report the percent on Form 496.