FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
5007 NE 39th Avenue
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Florida Method of Test for Sampling of Post-Tensioned Tendon Grout

Designation: FM 5-618

1. SCOPE

1.1. Method covers the procedures for obtaining a proper sample and sample preparation of Post Tensioned (PT) tendon grout.

1.2. Use ***FM 5-553*** to obtain sulfate level from sample.

1.3. Use the sulfate level to derive a sulfate concentration for the sample.

2. REFERENCED DOCUMENTS

AASHTO R 76 – Standard Practice for Reducing Samples of Aggregate to Testing Size

FM 5-553 - Florida Method of Test for Sulfate in Soil and Water

FM 5-619 - Florida Method of Test for The Evaluation of Post-Tensioned Tendon Grout by Using Inclined Tube Specimens

3. SAMPLES

3.1. Grout Sampling: Every effort should be made to obtain a grout sample that is representative of the bulk material. Obtain as much representative material as possible, not to exceed 100 g. Use clean tools and avoid contamination when gathering samples. The collected sample should be placed in plastic or plastic lined bags.

3.1.1. Bagged Material: Sample from high port vent from the inclined tube test (***FM 5-619***) and allow to reach final set time before testing.

3.1.2. In-Service Tendon: Sample from a previously surveyed area of the PT tendon or obtain grout from a high point on the duct system. If new construction, allow to reach final set time before testing.

3.2. Transporting Samples: Ensure that samples are stored in cool, dark conditions after sampling and during transportation.

3.3. Storing Samples: Store samples at room temperature prior to analysis.

4. SAMPLE PREPARATION

4.1. If necessary, crush the sample to approximately 3/4” size using jaw crusher or another suitable device. Spread the sample in a thin layer on a clean tray and dry under ambient conditions until a constant mass is achieved, or dry in an oven at no higher than 140˚F (60˚C) for 24 hours or until a constant mass is achieved. Pulverize sample with mechanical pulverizer or another suitable device until it passes through a No.100 Mesh (150 um) sieve. Split the sample per ***AASHTO R 76*** to obtain 25 ± 1 g.

4.2. Weigh 5 ± 0.1 g of the dried powder and transfer it into a clean 250 mL beaker. Add 200 mL of deionized water to obtain 1:40 leaching volume; stir and cover with a watch glass.

4.3. Place the beaker on a hot plate set to 135 ± 5˚F (57 ± 3˚C) or in a hot water bath set to 135 ± 5˚F (57 ± 3˚C). Remove the sample after 18-24 hours.

4.4. Set up a 500 mL filter flask. Place a funnel on top of the flask. Fold and place a No. 42 filter paper in the funnel and connect the filter flask to a vacuum source.

4.5. Use deionized water in a wash bottle for all rinsing. Rinse any residue left on the stirring rod and on the underside of the watch glass into the filter funnel. Decant as much solution as possible through the filter and then rinse any residue from the beaker into the filter funnel.

4.6. Transfer the obtained solution to a 250 mL volumetric flask and add deionized water to bring to volume.

5. PROCEDURE

5.1. Use ***FM 5-553*** to obtain sulfate level in parts per million.

5.2. Comply with ***Sections 2, 3 and 6*** of ***FM 5-553***.

6. CALCULATIONS

Convert the result obtained from ***FM 5-553*** to sample sulfate concentration (mg/g) using the following formula:

$$M = \left(\frac{C*V}{m}\right) \qquad \text{Equation 1}$$

where, M : sample sulfate concentration (mg/g)
C : solution sulfate concentration (ppm)
V : volume of solution (L)
m : dry mass of grout (g)

7. REPORT

The following information should be reported.

Sulfate concentration in mg/g.