

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES  
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## **METHOD OF TEST FOR SOILS, CONCRETE PATCHING MATERIALS AND WATERS FOR SULFATE CONTENT**

### **A. SCOPE**

This test method describes the procedure for determination of the soluble sulfate content of soils, concrete patching materials and waters. Concrete patching materials can be rapid setting concrete, mortar, bonding agent or material, fast setting grout, filler material, or shotcrete. These results are used in determining the corrosive nature of the environment for concrete structures, as well as for other purposes. This test method is divided into the following parts:

1. Sulfate content of soils
2. Sulfate content of concrete patching materials

### **B. REFERENCES**

|                  |   |
|------------------|---|
| ASTM C 109       | Compressive Strength of Hydraulic Cement Mortars        |
| ASTM E 11        | Woven Wire Test Sieve Cloth and Test Sieves             |
| CT 201           | Soil and Aggregate Sample Preparation                   |
| EPA Method 300.0 | Determination of Inorganic Anions by Ion Chromatography |

### **C. APPARATUS**

1. Sieve – No. 8 and No. 50
2. Balance – capable of weighing 100g, with precision of at least 0.1g.
3. Erlenmeyer flask – 500 mL

### **D. PROCEDURE**

1. Conduct the test of water and extract samples in accordance with Environmental Protection Agency Test Method 300.0

## **PART 1. SULFATE CONTENT OF SOILS**

### **1A. SCOPE**

This test method describes the extraction procedure to determine the soluble sulfate content of soils.

### **1B. PROCEDURE**

1. Prepare the soil sample in accordance with California Test 201. Split a sample from material passing a No. 8 sieve.
2. Weigh 100g of sample and place it in a 500 mL Erlenmeyer flask. Add 300 mL of deionized water, place a stopper on the flask, and shake vigorously for 15 minutes. Centrifuge the sample, then filter the sample or let the sample settle overnight.
3. Test extract for soluble sulfates.

## **PART 2. SULFATE CONTENT OF CONCRETE PATCHING MATERIALS**

### **2A. SCOPE**

This test method describes the extraction procedure for determination of the water-soluble sulfate content of concrete patching materials.

### **2B. PROCEDURE**

1. Prepare and cast a 2 in. cube of patching material as recommended by the manufacturer's data sheet. Let cure 7 days at ambient conditions. Crush and pulverize the cured block, split a 100g sample from the pulverized material passing a No. 50 sieve.
2. Proceed with testing as in Part 1, Section 1B, parts 2 and 3

## **E. REPORTING OF RESULTS**

Report either in percent soluble sulfates or parts per million of soluble sulfates as  $\text{SO}_4$ .

## **F. HEALTH AND SAFETY**

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and

exposure, chemical procurement and storage, and personal protective apparel and equipment.

Refer to the Safety Manual for your Laboratory.

**End of Text**  
**(California Test 417 contains 3 pages)**