



## **WSDOT Test Method T 420**

### ***Test Method for Determining the Maturity of Compost (Solvita Test)***

#### **1. Scope**

The Solvita test is used for evaluating compost conditions.

#### **2. Reference Documents**

AASHTO T-2

#### **3. Terminology**

##### 3.1 Definitions

3.1.1 Compost shall be stable, mature, decomposed organic solid waste that is the result of the accelerated, aerobic biodegradation and stabilization under controlled conditions. The result is a uniform dark, soil-like appearance.

3.1.2 Maturity of any compost sample may be judged using both color test results from paddle A and C. Paddle A is a styrene paddle with a gel component that measures the ammonia content of the compost. Paddle C is a styrene paddle with a gel component that measures the carbon dioxide emitted by the compost sample.

#### **4. Summary of Test Method**

There are three easy steps involved in using the Solvita test kit to evaluate compost.

4.1 Obtain and prepare the sample.

4.2 Perform the test by placing both Solvita gel-paddles in the jar.

4.2 Determine compost maturity using the color keys provided in the kit.

#### **5. Significant and Use**

This test is used to determine the maturity of compost materials delivered in the field for use. This test measures the amount of ammonia and carbon dioxide in the compost.

#### **6. Apparatus**

6.1 Solvita Kit containing the following:

- a testing jar with lid
- a carbon-dioxide paddle (marked with “C”) is purple
- an ammonia paddle (marked with “A”) is yellow
- color determination charts

6.2 Shovel

6.3 Small trowel or spoon

6.4 A clean container large enough to combine the sample (approximately 5 gallons)

6.5 A clean surface for mixing the sample such as a tarp or plywood

## 7. Sample Preparation

- 7.1 A composite sample (approximately 1 cubic foot) representing the lot to be tested should be sampled in accordance with AASHTO T-2 “Sampling from Stockpiles” or “Sampling from Transport Units”.
- 7.2 Place the sample on a hard, clean, level surface where there will be neither loss of material nor the accidental addition of foreign material.
- 7.3 Particles such wood chips which are too large for the jar (over ½ inch) should be removed or screened from the compost sample.
- 7.4 Checking for optimal moisture is absolutely necessary for accurate maturity testing. Samples which are either too wet or too dry are not likely to produce accurate results. The moisture level should be judged by the squeeze test before proceeding. Perform the Squeeze test by squeezing a small handful of compost. When squeezed tightly the compost should feel wet without producing any free water. Compost that is too dry is dusty and will not clump with hard squeezing.
- 7.5 Mix the material thoroughly by turning the entire sample over three times. With the last turning, the entire sample shall be placed into a conical pile.
- 7.6 Using a small trowel, or other device, remove a portion from the center of the pile.
- 7.7 Fill the jar to the fill line and obtain proper density by sharply tapping the bottom of the jar on a counter. Fluffy or coarse composts should be compacted by pressing firmly into the jar.
- 7.8 If compost to be tested is in an optimal state, allow to air out for one hour.
- 7.9 If compost to be tested is not in an optimal state, then the following should be performed:
  - 7.9.1 If the sample is hot, it should be covered and allowed to cool to room temperature before testing.
  - 7.9.2 If the sample is too wet, it should be dried until it passes the squeeze test.
  - 7.9.3 If the sample is too dry, add clean water until it passes the squeeze test. This sample shall be covered and allowed to stand at room temperature for 24 hours before performing the test.

## 8. Procedure

- 8.1 Open each package by tearing along the top strip and carefully remove the paddle by grasping the handle. *Do not touch the special gel surface, and don't allow compost to touch it.* Once the gelpack is opened, the test should be started within 30-minutes. The gel is not harmful to touch, but should be kept out of the mouth and eyes.
- 8.2 Insert the paddles into the sample at right angles to each other so that they can be seen through the viewing side. The edges of the paddles can be touching in the middle. Position the two paddles as indicated by the color squares on the jar label. Push the paddle tips into the compost to the bottom of the jar. Be careful not to jostle or tip the jar. Do not use a paddle if the gel is dried out or if the color is not the “Control Color” indicated on the respective color charts.
- 8.3 Screw the lid on tight, and keep the jar at room temperature 68-77° F (20-25° C) out of direct sunlight for 4 hours ± 10 minutes.

## 9. Evaluating the Results

- 9.1 Read the Solvita paddle colors 4 hours after the test is started. To read the colors, observe the paddles through the viewing side of the jar with the lid in place and illuminated from the front. Color rendition is best in moderate-intensity, fluorescent room light. Compare to the color charts provided with the kit, and record the color numbers that most closely match. Since the Solvita colors may continue to change after 4-hours, the proper interpretation for this test is based on a 4-hour  $\pm$  10 minute reading.

## 10. Reports

- 10.1 Report both the readings for the “A” paddle and the “C” paddle in the Inspector’s Daily Report.



**Performance Exam Checklist**

**Determining the Maturity of Compost (Solvita Test)  
WSDOT Test Method T 420**

Participant Name \_\_\_\_\_

Exam Date \_\_\_\_\_

**Procedure Element**

**Yes No**

- 1. The tester has a copy of the current procedure on hand?

**Sample Preparation**

- 1. Representative sample obtained per AASHTO T-2?
- 2. Sample placed on clean hard surface?
- 3. Check for optimal moisture?
- 4. Sampled mixed thoroughly?
- 5. Small sample taken from the center of the pile?
- 6. Sample filled in jar to the proper line and compacted?
- 7. Sample allowed to air out for 1 hour or equilibrate for 24 hours?

**Sample Preprocedure**

- 1. Open the gel packs with out touching the gel sticks?
- 2. Is the test started within 30 minutes of opening the gel pack?
- 3. Are the paddles inserted in the compost at right angles to each other?
- 4. Are the paddles positioned to be seen through the viewing window?
- 5. Are the paddles pushed to the bottom of the jar?
- 6. Is the lid screwed on tight?
- 7. Is the jar at room temperature 68-77°F?
- 8. Is the test run for 4 hours ± 10 minutes?
- 9. Maturity determined per Manufacturers instructions?

First Attempt: Pass      Fail

Second Attempt: Pass      Fail

Signature of Examiner \_\_\_\_\_

Comments: