

Method of Test for
**SOLIDS AND INFRARED ANALYSIS (IR) OF LIQUID ADMIXTURES
FOR PORTLAND CEMENT CONCRETE**
DOTD Designation: TR 524-93

I. Scope

- A. This method determines the percent solids of liquid portland cement concrete admixtures. The dried test specimen resulting from this method is used for infrared spectrophotometric analysis.
- B. Reference Document - DOTD TR 610, Infrared Spectrophotometric Analysis.

II. Apparatus

- A. **Drying oven** - capable of maintaining a temperature of $105 \pm 3^\circ\text{C}$ ($220 \pm 5^\circ\text{F}$).
- B. **Aluminum weighing pan** - approx. 5/8 in. in height with an approximate 2 in. inside diameter.
- C. **Desiccator**.
- D. **Analytical balance** - 120 g capacity sensitive to 0.0001 g.
- E. **Syringe**.
- F. **Thermal gloves, apron, tools, eye protection** - for handling hot materials.
- G. **Worksheet** - Admixtures for Concrete. (Figure 1)

III. Sample

The sample shall consist of approximately 1 qt of liquid admixture. The test specimen shall consist of approximately 10 mL of liquid admixture.

IV. Health Precautions

Proper equipment and precautions are to be used whenever hot materials or equipment must be handled. Use container holders or gloves while handling hot containers.

V. Procedure

- A. Weigh aluminum weighing dish and record to the nearest 0.0001 g.

- B. Using a syringe add approximately 10 mL liquid admixture to the pan.
- C. Weigh aluminum weighing dish with admixture and record to the nearest 0.0001 g.
- D. Place aluminum weighing pan with admixture in the drying oven for 18-25 hours.
- E. Remove aluminum weighing pan with dried admixture from the oven and place in the desiccator for about 30 min.
- F. Weigh aluminum weighing pan with dried admixture and record to the nearest 0.0001 g.
- G. Perform infrared spectrophotometric analysis on the dried admixture in accordance with DOTD TR 610.

VI. Calculations

Calculate the % solids (A) using the following formula:

$$A = \frac{(W_3 - W_1) \times 100}{W_2 - W_1}$$

where:

- W_1 = weight of aluminum weighing pan, g
- W_2 = weight of aluminum weighing pan and admixture, g
- W_3 = weight of aluminum weighing pan and dried admixture, g
- 100 = constant

example:

- W_1 = 1.2864 g
- W_2 = 2.2064 g
- W_3 = 1.7244 g

$$\begin{aligned} A &= \frac{(1.7244 - 1.2864) \times 100}{2.2064 - 1.2864} \\ &= \frac{0.4380 \times 100}{0.9200} \\ &= 47.608 \\ A &= 47.6\% \end{aligned}$$

VII. Report

Report the % solids to the nearest 0.1 percent.

VIII. Normal Test Reporting Time

Normal test reporting time is 2 days.

Louisiana Department of Transportation and Development
Materials Section

7/81

ADMIXTURES FOR CONCRETE

REMARKS 2

TEST RESULTS (Max. of 15 characters) P/F

TYPE Master Pave N | xxxxx

INFRARED SPECTROPHOTOMETRIC ANALYSIS (TR 610).... | XXXXXXXXXXXXXXXXXXXXXXX | P
Standard Curve # 321786

SOLIDS, % (B + A) x 100 (TR 524)..... | 47.6 | P

Wt. of Tare + Sample, g. 2.2064
Wt. of Tare, g. 1.2864
Wt. of Sample, g. (A) 0.9200
Wt. of Tare + Sample after Evap., g. 1.7244
Wt. of Tare, g. 1.2864
Wt. of Residue, g. (B) 0.4380

DOSAGE, OZ.: WRNS | XXXXXXXXXXXXXXXXXXXXXXX | xxxxx

DOSAGE, OZ.: WRSR | XXXXXXXXXXXXXXXXXXXXXXX | xxxxx

DOSAGE, OZ.: AIR ENTRAINING | XXXXXXXXXXXXXXXXXXXXXXX | xxxxx

CHLORIDE CONTENT, % (3.543 x V x N) + W (TR 502). | |

Silver Nitrate, Normality, (N) _____
Sample Wt., g., (W) _____
Corrected End Point, ml., (V) _____

SPECIFIC GRAVITY (ASTM D891)..... | |

pH (ASTM E70)..... | |

Tested by: RA Date: 1/8/93 Checked by: Q10B Date: 1/8/93

APPROVED BY: G.D. Byrd Date: 1/8/93

09 / 424-05-0087 /101/|2|2|-5|7|7|1|1|3|/N

Figure 1
Admixtures for Concrete Worksheet