

Method of Test for  
**DETERMINING CHLORIDE CONTENT IN ADMIXTURES  
FOR PORTLAND CEMENT CONCRETE**  
DOTD TR 643-10

**I. Scope**

This method describes the determination of chloride content in admixtures for Portland cement concrete.

**II. Apparatus**

- A. **Volumetric flask** – 100 mL
- B. **Deionized Water**
- C. **Volumetric Pipet** – 25 mL
- D. **Bulb** for pipet
- E. **Rubber stopper** for flask
- F. **Admixtures for Concrete** worksheet, Figure 1

**III. Health Precautions**

Proper equipment and precautions are to be used whenever toxic samples are used. Use appropriate safety equipment such as safety glasses, gloves, and lab coats. Wash hands frequently.

**IV. Samples and Reagents**

- A. Standard solutions of chloride ions with a concentration accurate to 100, 200, and 400 ppm to create calibration curve.
- B. Refer to LA DOTD Materials Sampling Manual S 601-99 Section III., Liquid in Drums and Other Containers. Ensure that the representative portion of the sample is stored in a metallic container with a secure lid.

**V. Calibration and Standardization**

- A. Apparatus - Give detailed instructions for calibration and adjustment of the apparatus, if necessary.
- B. Reference Standards - Give detailed instructions for the standardization and use of reference standards. Describe any standards used to assure uniformity of the test technique, standard specimens or photographic standards.
- C. Calibration Curves and Tables - Give detailed instructions for the preparation and use of calibration solutions, reference standards, blanks, color development, photometry, construction, etc.

**VI. Procedure**

- A. Transfer 25 mL of the test specimen to the volumetric flask by using the 25 mL volumetric pipet and bulb. Ensure that the meniscus reaches the 25 mL mark on the volumetric pipet.
- B. Dilute with deionized water until the meniscus reaches the 100 ml mark on the volumetric flask.
- C. Record the ratio (1:3) on the admixture worksheet.
- D. Ensure test specimen is homogenized by inverting the volumetric flask several times with the use of the rubber stopper.
- E. Perform analysis on calibrated (ICP) against chloride standards.
- F. Record the concentration of chloride in parts per million (ppm) on admixture worksheet.

**VII. Calculation and Interpretation of Results**

$$\% \text{ chloride} = (A \div 10000) \times D$$

Where,

A = chloride concentration in (ppm)  
obtained from the ICP

10000 = constant (conversion from ppm to percentage)

D = dilution factor (for ratio of 1:3, dilution factor is 4)

Example,

A = 100 ppm

D = 4 (ratio is 1:3)

$$\begin{aligned} \% \text{ chloride} &= (A \div 10000) \times D \\ &= (100 \div 10000) \times 4 \\ &= (0.01) \times 4 \\ &= 0.04 \end{aligned}$$

**VIII. Report**

The data shall be reported to the nearest hundredth percent chloride on the admixture worksheet, figure 1.

**IX. Normal Test Reporting Time**

The normal amount of time to report on chloride content analysis in admixtures is approximately 2 days.

X. Illustrations and Tables

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Louisiana Department of Transportation and Development  
Materials Section

ADMIXTURES FOR CONCRETE

REMARKS 2

\_\_\_\_\_

\_\_\_\_\_

TEST RESULTS

(Max. of 15 characters)

P/F

XXXXXXXXXXXXXXXXXXXXXXXXXXXX | XXX

TYPE .....

Darex II | XXX

INFRARED SPECTROPHOTOMETRIC ANALYSIS (TR 610) .....

XXXXXXXXXXXXXXXXXXXXXXXXXXXX | P

Standard Curve # 58BM

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

9.184 | P

Wt. of Tare + Sample, g

5.746

Wt. of Tare, g

0.985

Wt. of Sample, g (A)

4.801

Wt. of Tare + Sample after Evap., g

1.407

Wt. of Tare, g

0.985

Wt. of Residue, g (B)

0.473

XXXXXXXXXXXXXXXXXXXXXXXXXXXX | XXX

DOSAGE, g: WRNS ( C x 28.35) .....

Dosage, oz: WRNS (C)

DOSAGE, g: WRSR ( D x 28.35) .....

Dosage, oz: WRSR (D)

DOSAGE, g: AIR ENTRAINING ( E x 28.35) .....

Dosage, oz: Air Entraining (E)

CHLORIDE CONTENT, % (A/10,000) x D (DOTD TR 643) .....

0.04% |

A (ppm)

100

D (dilution factor)

4

Tested by: TM

Date: 3/18/10

Checked by: \_\_\_\_\_

Date: \_\_\_\_\_

APPROVED BY: ENGINEER

Date: 3/18/10

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Figure 1