

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENT 1001
APPROVAL AND TESTING OF AIR ENTRAINING AGENTS
AND CHEMICAL ADMIXTURES FOR CONCRETE
April 18, 2008**

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1001.01 Purpose. This supplement describes the approval procedure for air entraining agents, Item 705.10, and chemical admixtures, Item 705.12.

1001.02 Submission for Preapproval. Manufacturer's requesting approval for their admixtures will provide a sample to an independent laboratory. Include with the sample the required production acceptance ranges defined in section 6 of ASTM C 494 or section 5.4.1 and 5.4.3 of ASTM C 260 to the independent laboratory. The independent laboratory will test the sample to show compliance with 705.10 and/or 705.12.

The manufacturer will submit to Office of Materials Management the following:

- A. Certified test data from the independent laboratory meeting Item 101.03 and documenting compliance with the applicable specification. Test data must not be more than five years old based on the date the test was completed. The test report will also document the required production acceptance ranges along with the actual test values measured by the independent laboratory.
- B. A written agreement to notify the Office of Materials Management of any change in formulation, raw materials, or production methods used in the manufacture of the listed material.
- C. A sample, at least one gallon (3.875 liters) in size,
- D. A current MSDS sheet,
- E. A current Product Data Sheet

F. An infrared spectrophotometric scan, method of sampling and material used in the crystal.

G. A name, address, phone and fax numbers, and an e-mail address for the persons serving as a primary and secondary contact for reporting the Department's test results.

H. A technical data sheet stating the dosage rates, Oz/hundredweight, for each admixture.

1001.03 Chloride Content Limitation. Air entraining agents and chemical admixtures contributing more than 50 parts per million (ppm) chloride ions by weight of cement may not be used without written permission from the Director. Chloride Contribution data should therefore be submitted expressed as ppm by weight of cement at a dosage rate of 1 fluid ounce per 100 pounds (33 ml/50 kg) of cement.

Example: A commonly used admixtures has a chloride content of 1 fluid ounce per 100 pounds (2.2 ppm at a dosage rate of 33 ml/50 kg) of cement. Assume we are mixing Class C concrete using 600 pounds of cement per cubic yard (356 kg/m³), and propose adding the above admixture at a rate of 4 fluid ounces per 100 pounds (130 ml/50 kg) of cement. The chloride ion content contributed by weight of cement is found by multiplying the actual dosage rate of 4 fluid ounces (130 ml) by the 1 fluid ounce per 100 pounds (ppm at 33 ml/50 kg) of cement. In this case that is $4 \times 2.2 = 8.8$ ppm ($130/33 \times 2.2 = 8.8$ ppm). Since 8.8 ppm is less than the 50 ppm allowed, this admixture can be used at the proposed rate of 4 fluid ounces per 100 pounds (130 ml/50 kg) of cement.

1001.04 Initial Acceptance of Product. The Office of Materials Management will review the submittal for completeness; review the certified test data; and run verification tests on the sample. If the submittal's independent test data and verification testing meets the specification requirements, the product will be added to the Department's Qualified Products list (QPL). The Department will randomly pull a production sample within 30 days of approval.

1001.05 Re-certification. By January 1 of each year, the manufacturer will certify the material is not altered or changed from that originally approved. Include the quality control values, in tabular form, for each product manufactured the prior year and a technical data sheet stating dosage rates by type with the letter. List each uniformity test as a minimum, maximum and average. The manufacturer will resubmit certified data and samples with any notification of change.

1001.06 Manufacturer's Elective Submittal Data The manufacturer may supply the Department acceptance ranges for viscosity, pH and ash content for their products. These values will not be used for acceptance or rejection but will allow the Department to clarify and evaluate the reasons for a failed sample.

1001.07 Random Quality Assurance Testing Air entraining agents and chemical admixtures will be randomly sampled at concrete producer plants. A one quart sample will be obtained from the concrete producer's dispensing unit in a manner that is representative of the procedure used to introduce the material into the concrete. The sample will be submitted to the Office of Materials Management, Chemical Section, for testing.

1001.08 Notification of Test Results The manufacturer will be notified of the first failure of quality assurance sample by informal means such as email or a fax containing the material sample information and test results. If two in ten consecutive quality assurance samples fail, the manufacturer will be notified in writing of this event. The manufacturer will have thirty days from the date of notification to resolve the problem and supply the Office with an acceptable explanation and solution to solve the problem. If three in twenty consecutive unresolved quality assurance samples fail, the product will be suspended from the qualified product list. The primary contact for the Office of Materials Management is the Cement & Concrete Engineer.

1001.09 Loss or Acceptance The producer may appeal any product's loss of acceptance. Submit a written appeal to the Administrator, Office of Materials Management, with the reasons the product should not have lost acceptance. The Administrator will have 30 days to respond with a decision. If the producer does not accept the Administrator's decision appeal the decision to the Qualified Products List appeal board (QPLAB). For information on the QPLAB see <http://www.dot.state.oh.us/testlab/SamplingandTesting/2008/SamplingandTesting/manual.html> Under preface access Qualified Products List SOP and section H of the SOP.

APPENDIX

I. Methods of testing

A. The air entraining agents are tested under ASTM C 233

B. The chemical admixtures are evaluated under ASTM C 494 with the following exceptions:

C. Specific gravity

i. Apparatus

-PAAR DMA 48 Density Meter

ii. Method

-according to manufacturer's instructions.