

**924 ADMIXTURES FOR CONCRETE.**  
**(REV 3-1-17) (FA 3-1-17) (7-17)**

SUBARTICLE 924-2.7 is deleted and the following is substituted:

**924-2.7 For Corrosion Inhibitors:** Corrosion inhibitors shall meet the requirements of ASTM G109 and all requirements in this Section.

Calcium nitrite is a chemically reactive admixture used in concrete to inhibit the corrosion of embedded reinforcing steel and other metallic components. The calcium nitrite supplier shall submit to the Engineer test certificates from an independent laboratory indicating compliance with this Specification. The test certificate shall include corrosion inhibiting properties per ASTM G109 and results of physical tests included in this section. Calcium nitrite shall be supplied by the same manufacturing source throughout the project. If a single primary source of calcium nitrite cannot be maintained throughout the project, new test certificates shall be submitted. The Engineer will determine specification compliance of a new supplier's product, and evaluate the effectiveness of the new calcium nitrite product before approving the source.

The active ingredient shall be calcium nitrite  $\text{Ca}(\text{NO}_2)_2$ .

The calcium nitrite shall be furnished in solution containing not less than 29% calcium nitrite solids. The concentration of the calcium nitrite solution shall be verified by spectrophotometric analysis or other comparable methods. The nitrite concentration shall be measured in accordance with Standard Methods for the Examination of Water and Waste Water, 18th Edition.

A volume of one gallon of calcium nitrite solution shall weigh within the range of 10.40 to 11.92 lb.

The calcium nitrite solution shall be added to the concrete mixture at a rate of 4.50 to 4.60 gal/yd<sup>3</sup> of concrete.

The addition of calcium nitrite to the concrete mix shall not adversely affect the properties of fresh and hardened concrete.

Calcium Nitrite concrete shall meet the following physical requirements when mixed and tested in accordance with AASHTO M194:

Water Content, % of control	95 to 100
Time of setting, allowable deviation from control, h:min:	
Initial: at least not more than	1:00 earlier nor 1:30 later
Final: at least not more than	1:00 earlier nor 1:30 later
Compressive Strength, min. % of control:	shall be 100 for all ages
Flexural strength, min. % of control:	shall be 100 for all ages
Length change, max Shrinkage (alternative Requirements): % of control	135
Increase over control	0.010
Relative durability factor, min	80

The following table lists the corrosion inhibiting test result limits for calcium nitrite concrete tested in accordance with ASTM G109:

Maximum Allowable Test Results of Calcium Nitrite Concrete	
Measured average macrocell current any time during the test	10 $\mu$ A
Average macrocell current at test completion	2 $\mu$ A
Average visible corrosion measured as percent corroded area of control	85%

SUBARTICLE 924-2.8 is deleted and the following is substituted:

**924-2.8 Type S (Specific Performance):** Specific performance admixtures shall meet the requirements of ASTM C494 for Type S admixtures except the compressive strength at one year, flexural strength and relative durability factor requirements are waived. The following Type S admixtures may be added to plastic concrete.

**924-2.8.1 Workability Retention:** Workability retention admixtures are used to extend workability and slump life without retarding the setting time. The dosage rate used shall be based on the manufacturer's recommendation in order to maintain 80% of the initial measured slump after 60 minutes.

**924-2.8.2 Shrinkage Reducing:** Shrinkage reducing admixtures are used to minimize the shrinkage of plastic and hardened concrete. The dosage rate used shall be based on the manufacturer's recommendation and may vary for a specific application.

**924-2.8.3 Rheology Modifying:** Rheology modifying admixtures are used to maximize the rheology of plastic concrete. The dosage rate used shall be based on the manufacturer's recommendation and may vary for a specific application.