

Section 4103. Liquid Admixtures for Portland Cement Concrete

4103.01 GENERAL REQUIREMENTS.

- A. Guidelines** Comply with AASHTO M 154 for air entraining admixtures and AASHTO M 194 for other liquid admixtures.
1. Obtain the Engineer's approval for liquid admixtures for PCC. Submit evidence for the Engineer to evaluate showing the material meets requirements of AASHTO M 154 for air entraining admixtures and AASHTO M 194 for other liquid admixtures, based on tests made in a recognized laboratory. A recognized laboratory is any laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institute of Standards & Technology.
 2. Tests may be made on samples:
 - The Contractor has submitted taken from a quantity for use on the project, or
 - The manufacturer has submitted and certified as representative of the admixture to be supplied.
 3. Unless the Engineer approves, do not use admixtures containing more than 1.0% chloride ions.
 4. Inspection and acceptance of liquid admixtures for PCC will be according to [Materials I.M. 403](#).
- B D. Air Entraining Admixtures.**
Stir, agitate, or circulate air entraining admixtures prior to use to ensure a uniform and homogeneous mixture.
- C E. Retarding and Water Reducing Admixtures.**
1. Use retarding and water reducing admixtures compatible with the air entraining agent used.
 2. As approved by the Engineer, use admixtures either:
 - In amounts recommended by the manufacturer for conditions which prevail on the project, or
 - According to [Materials I.M. 403](#).
 3. When used, introduce admixtures into the mixer after all other ingredients are in the mixer. The Engineer may approve other procedures.
 4. Agitate retarding and water reducing admixtures prior to and during their use according to [Materials I.M. 403](#).
 5. When supplementary cementitious materials are fly ash is used in the concrete, apply the liquid admixture dosage rate to both the cement and supplementary cementitious materials fly ash weight (mass) combined.
- D F. Other Admixtures.**
Other admixtures may be used with the Engineer's approval and according to the manufacturer's recommendations.