Introduction:
Concrete Admixtures are natural or synthetic substances which, when added to concrete before or during mixing, will impart special properties to fresh or hardened concrete. Admixtures are commonly used to intentionally entrain air (form tiny bubbles in the concrete), reduce water content of the concrete mix design, increase workability, adjust setting time or hardening, and adjust other concrete properties.

Currently there are eight different types of concrete admixtures, according to ASTM C494: Standard Specification for Chemical Admixtures for Concrete:

- Type A—Water-reducing admixtures
- Type B—Retarding admixtures
- Type C—Accelerating admixtures
- Type D—Water-reducing and retarding admixtures
- Type E—Water-reducing and accelerating admixtures
- Type F—Water-reducing, high range admixtures
- Type G—Water-reducing, high range, and retarding admixtures
- Type S—Specific performance admixtures.

Air entraining admixtures are their own type of admixture, and evaluated using AASHTO T157: Standard Method of Test for Air-Entraining Admixtures for Concrete.

This technical committee contracts outside laboratory to evaluate the different types of concrete admixtures according the NTPEP Workplan, using the following test methods and standards:
• AASHTO M194, Standard Specification for Chemical Admixtures for Concrete
• AASHTO T157, Standard Method of Test for Air Entraining Admixtures for Concrete
• ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete
• ASTM E1252, Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
• ASTM E70, Standard Test Method of pH of Aqueous Solutions with the Glass Electrode
• AASHTO R18, Standard Practice for Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
• BS EN 480-10:2009, Admixtures for concrete, mortar and grout. Test methods. Determination of water soluble chloride content

Key Aspects of the Program:
This program evaluates concrete admixtures according to the standard specifications and methods laid out in the CADD workplan. The data generated will allow NTPEP member states to select concrete admixtures for usage in their state, and placement on that state’s APL/QPL. 100+ products are generally tested per year, and products will need to be re-submitted to the technical committee every five years.

Terminology:
• Concrete Admixture
  o natural or synthetic substances which, when added to concrete before or during mixing, will impart special properties to fresh or hardened concrete
• Type A Admixture – Water Reducing
  o Type A water-reducers typically decrease the water content of a concrete mix by 5% to 10%
• Type B Admixture – Retarding Admixtures
  o Retarding admixtures cause a decrease in the rate of hydration of hydraulic cement and lengthen the setting time of concrete. Retarders are used to offset the effect of high temperature and improve the workability of concrete in warmer temperatures
• Type C—Accelerating admixtures
  o Accelerators are used to shorten setting time and to increase early strength development.
• Type D—Water-reducing and retarding admixtures
  o An admixture that both reduces the water content of a concrete mix by 5% to 10% and decreases the rate of hydration
• Type E—Water-reducing and accelerating admixtures
  o An admixture that both reduces the water content of a concrete mix and shortens the set time of concrete
• Type F—Water-reducing, high range admixtures (HRWRs)
  o HRWRs must reduce the water content of a concrete mix by at least 12% and may reduce water by more than 30% from a control mix.
• Type G—Water-reducing, high range, and retarding admixtures
  o An admixture that both reduces the water content of a concrete mix by at least 12% and decreases the rate of hydration
• Type S—Specific performance admixtures.
  o These admixtures impart specific performance attributes to the concrete. This technical committee DOES NOT evaluate the specific performance attribute.

Review of Evaluations and Significance of Data Generated:

The standard practice provides details’ regarding the standard testing that is used for evaluation of these products. Due to the varying types of admixtures evaluated by the program, ASTM C494 and AASHTO T157 should be referenced when determining the significance of the data generated for each admixture tested.