



SECTION 1054

CONCRETE ADMIXTURES

1054.1 Scope. This specification covers air-entraining admixtures, water-reducing admixtures, retarding admixtures, accelerating admixtures and latex emulsion admixtures for concrete.

1054.2 Acceptance. All material under this specification shall be obtained from a source identified on the PAL designated for this specification. All material under this specification will be inspected and accepted in accordance with [Sec 106](#).

1054.3 Air-Entraining Admixtures. Air-entraining admixtures shall be in accordance with AASHTO M 154, except as modified herein.

1054.3.1 Certification. The manufacturer shall submit a certification to Construction and Materials prior to approval. The certification shall provide the following:

- (a) The brand name and designation.
- (b) The composition or description of the admixture.
- (c) The manufacturing ranges for percent total solids and pH by AASHTO T 200.
- (d) The infrared spectrum.
- (e) The manner in which the material will be identified on containers.
- (f) The material is in accordance with these specifications.

1054.3.1.1 Certifications shall include or have attached specific test results as required in [Sec 1054.3.1.2](#) or [Sec 1054.3.1.3](#).

1054.3.1.2 For an air-entraining admixture other than that specified in [Sec 1054.3.1.3](#), the certification shall include results of tests conforming to the requirements of AASHTO M 154. Tests for bleeding, bond strength and volume change will not be required.

1054.3.1.3 For an air-entraining admixture that is an aqueous solution of vinsol resin manufactured by neutralizing the resin with sodium hydroxide, the certification shall include results of tests showing the ratio of sodium hydroxide to vinsol resin. The certification or test report shall also state that no other additive or chemical agent is present in the solution.

1054.3.2 Packaging and Marking. The containers in which air-entraining admixtures are delivered shall be plainly marked with the manufacturer's name, the brand name and designation of the material, lot number and net quantity. A delivery ticket showing this information shall accompany bulk shipments. If the manufacturer supplies air-entraining admixtures in more than one concentration, the concentration shall be designated on the container, or for bulk shipments, in a prominent manner on the delivery ticket.

1054.4 Water-Reducing Admixtures. Water-reducing admixtures shall be in accordance with AASHTO M 194, Type A, except as modified herein. High range water-reducing admixtures, when permitted for use, shall be in accordance with AASHTO M 194, Type F or Type G.

1054.4.1 Certification. The manufacturer shall submit certification to Construction and Materials prior to approval.

1054.4.1.1 The certification shall provide the following:

- (a) The brand name and designation.
- (b) The composition or description of the admixture.
- (c) The manufacturing ranges for specific gravity at 77 F (25 C) and percent total solids.
- (d) The infrared spectrum.
- (e) The manner in which the material will be identified on containers.
- (f) The material is in accordance with these specifications.

1054.4.1.2 The certification shall include or have attached specific test results in accordance with AASHTO M 194, Type A, F or G, as applicable, and the recommendation for use, including amounts to be added.

1054.4.2 Packaging and Marking. The containers in which water-reducing admixtures are delivered shall be plainly marked with the manufacturer's name, the brand name and designation of the material, lot number and net quantity. A delivery ticket showing this information shall accompany bulk shipments.

1054.5 Retarding Admixtures. Retarding admixtures shall be in accordance with AASHTO M 194, Type B or D, except as modified herein.

1054.5.1 Certification. The manufacturer shall submit certification to Construction and Materials prior to approval.

1054.5.1.1 The certification shall provide the following:

- (a) The brand name and designation.
- (b) The composition or description of the admixture.
- (c) The manufacturing ranges for specific gravity at 77 F (25 C) and percent total solids.
- (d) The infrared spectrum.
- (e) The manner in which the material will be identified on containers.
- (f) The material is in accordance with these specifications.

1054.5.1.2 The certification shall include or have attached specific test results in accordance with AASHTO M 194, Type B or D, and the recommendation for use, including amounts to be added.

1054.5.2 Packaging and Marking. The containers in which retarding admixtures are delivered shall be plainly marked with the manufacturer's name, the brand name and designation of the material, lot number and net quantity. A delivery ticket showing this information shall accompany bulk shipments.

1054.6 Accelerating Admixtures. Accelerating admixtures shall be in accordance with AASHTO M 194, Type C or E, except as modified herein.

1054.6.1 Certification. The manufacturer shall submit certification to Construction and Materials prior to approval.

1054.6.1.1 The certification shall provide the following:

- (a) The brand name and designation.
- (b) The composition or description of the admixture.
- (c) The manufacturing ranges for specific gravity at 77 F (25 C) and percent total solids.
- (d) The infrared spectrum.
- (e) The manner in which the material will be identified on containers.
- (f) The material is in accordance with these specifications.

1054.6.1.2 The certification shall include or have attached specific test results in accordance with AASHTO M 194, Type C or E, and the recommendation for use, including amounts to be added.

1054.6.2 Packaging and Marking. The containers in which accelerating admixtures are delivered shall be plainly marked with the manufacturer's name, the brand name and designation of the material, lot number and net quantity. A delivery ticket showing this information shall accompany bulk shipments.

1054.7 Latex Emulsion Admixtures. Latex emulsion admixtures shall be non-toxic, film-forming, polymeric emulsion in water to which all stabilizers have been added at the point of manufacture. The admixture shall be a styrene-butadiene latex emulsion in which at least 90 percent of the non-volatiles are styrene-butadiene polymers.

1054.7.1. Properties The admixture shall be homogeneous, uniform in composition and shall be in accordance with the following requirements when tested with the procedures shown in Report No. FHWA RD 78 35, April 1978, *Styrene-Butadiene Latex Modifiers for Bridge Deck Overlay Concrete*:

Property	Requirement
Color	White
Polymer Type	Styrene-Butadiene
Percent Solids	46 - 53
pH	5.0 - 12.0, the pH may not vary more than ± 1 from the pH of matl. submitted for prequalification.
Particle Size	1400 to 2500 Angstroms, the mean particle size shall not vary more than ± 300 Angstroms from the mean diameter of material submitted for prequalification.
Viscosity	± 20 centipoises of the viscosity of material submitted for prequalification.
Percent Coagulum	0.10 percent by weight (mass), max.
Freeze-Thaw Stability	0.10 percent by weight (mass) max. coagulum after 2 freeze-thaw cycles.
Surface Tension	50.0 dynes/cm, max.
Percent Butadiene	30 to 40 by weight (mass)

1054.7.2 Certification. The manufacturer shall submit certification to Construction and Materials prior to approval.

1054.7.2.1 The certification shall provide the following:

- (a) The brand name and designation.
- (b) The composition or description of the admixture.
- (c) The manufacturing ranges for specific gravity at 77 F (25 C) by AASHTO T 157, percent total solids by ASTM D 1644, Method A and pH by AASHTO T 200.
- (d) The infrared spectrum.
- (e) The manner in which the material will be identified on containers.
- (f) The material is in accordance with these specifications.

1054.7.2.2 The certification shall include or have attached specific test results in accordance with this specification.

1054.7.3 Packaging and Marking. The containers in which latex emulsion admixtures are delivered shall be plainly marked with the manufacturer's name, the brand name and designation of the material, lot number and net quantity. A delivery ticket showing this information shall accompany bulk shipments.