
Standard Specification for Detecting the Presence of Phosphorous in Asphalt Binder

AASHTO Designation: TP 78-09 (2013)¹



**American Association of State Highway and Transportation Officials
444 North Capitol Street N.W., Suite 249
Washington, D.C. 20001**

Detecting the Presence of Phosphorous in Asphalt Binder

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1. SCOPE

- 1.1. This qualitative test method can be used to identify the presence of polyphosphoric acid (PPA) in asphalt binder or residue. If PPA is present in the binder, a blue color is developed in approximately 5 min. The test method is not quantitative, but it can detect PPA at concentrations as low as 0.1 percent. The test method can only determine the presence of phosphorus. It is not specific for the presence of PPA. A positive test result assumes that the phosphorus is from PPA. Any additive that contains phosphorus will give a false positive for the presence of PPA.
- 1.2. The values stated in SI units are to be regarded as the standard.
- 1.3. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standard:*
■ R 66, Sampling Asphalt Materials

3. SUMMARY OF TEST METHOD

- 3.1. Butyl alcohol is used to extract some of the acid present from the asphalt. The extracted acid is then transferred to the water phase. The presence of phosphoric acid is detected by reaction with ammonium molybdate, potassium antimonyl tartrate, and ascorbic acid to form a blue color.

4. SIGNIFICANCE

- 4.1. Phosphoric acid may be added to asphalt binder to modify the physical properties of the binder. This test method detects the presence of phosphoric acid in the asphalt binder but is not a quantitative test. The result is either positive or negative that phosphoric acid is present.

5. APPARATUS

- 5.1. *Pipette*—Disposable, plastic transfer pipettes.
- 5.2. *Containers*—One-ounce cans, test tubes, or small beakers. Disposable cans or glassware are recommended to avoid contamination. If glassware is reused, it must be washed with hot (1 + 3) hydrochloric acid (1 part hydrochloric acid to 3 parts distilled water) and rinsed with distilled