



Standard Test Method for Rapid Field Test for Trace Lead in Unleaded Gasoline (Colorimetric Method)¹

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1. Scope*

1.1 This test method covers and is intended for use in the field by nontechnical people for the quantitative measurement of lead in unleaded gasoline in the range from 0.01 to 0.10 g Pb/U.S. gal (2.64 to 26.4 mg Pb/L). This method applies to all commercial gasolines and responds to all types of lead alkyls as well as to other organic and inorganic forms of lead.

NOTE 1—This test method is based on the use of the Mobil Lead Test Kit (Fig. 1).

NOTE 2—This test method is a screening test and is not to be used as a replacement for withdrawn Test Method D3116, withdrawn Test Method D3229, or Test Method D3237.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this 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. For specific warning statements, see Section 7.*

2. Referenced Documents

2.1 ASTM Standards:²

D3116 Test Method for Trace Amounts of Lead in Gasoline³

D3229 Method of Test for Low Levels of Lead in Gasoline by X-Ray Spectrometry³

D3237 Test Method for Lead in Gasoline by Atomic Absorption Spectroscopy

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.03 on Elemental Analysis.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Withdrawn.

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

D6792 Practice for Quality System in Petroleum Products and Lubricants Testing Laboratories

3. Summary of Test Method

3.1 The gasoline is treated with iodine and tetraethyl ammonium chloride in chloroform and subjected to ultraviolet light. The lead alkyls form water-soluble lead alkyl iodides, which are removed from the gasoline by shaking it with an aqueous ammonium nitrate solution. The aqueous extract is filtered into a solution of 4-(2-pyridylazo)-resorcinol disodium salt (PAR) and ammonium hydroxide. The lead is determined by measuring its PAR complex colorimetrically at 490 nm using a previously prepared calibration curve.

4. Significance and Use

4.1 This test is used to determine trace quantities of lead in unleaded gasoline. Unwarranted amounts of lead may cause deposits in automotive pollution control equipment and poisoning of catalytic mufflers.

5. Interferences

5.1 PAR also reacts with many other metals forming highly colored complexes. However, none of these are normally found present in a soluble form in gasoline. The following metals were found to form colors with PAR and if present may interfere to give high results: Fe II, Fe III, Co II, Ni II, Cu II, Zn II, Cd II, Mn II, Sn II, V IV, Pb II, U VI, Ti IV, and the rare earths.

6. Apparatus

6.1 *Ultraviolet Lamp*, long wavelength, 3660 Å, placed in a standard 4-W fluorescent fixture.

*A Summary of Changes section appears at the end of this standard.