



Designation: D 1551 - 68
(Reapproved 1973)

American National Standard Z11.128-1969 (R1974)
Reapproved March 18, 1974
By American National Standards Institute
Deutsche Norm DIN 51 788

Standard Method of Test for SULFUR IN PETROLEUM OILS (QUARTZ-TUBE METHOD)¹

This Standard is issued under the fixed designation D 1551; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

The committee responsible for this standard has voted its withdrawal. In the absence of substantial reasons that it should be continued, the Society will approve withdrawal from publication in November 1976.

1. Scope

1.1 This method covers the determination of sulfur, in concentrations ranging from 0.1 to 5.0 weight percent, in petroleum oils and related materials which can be weighed in an open container.

1.2 The method is particularly applicable to materials that cannot be burned completely in a wick lamp as defined in the scope of the lamp method (ASTM Method D 1266, Test for Sulfur in Petroleum Products (Lamp Method)²).

1.3 The method is applicable to the analysis of products that have been blended with organic additives containing chlorine because it provides a correction for the presence of chlorine. However, this method should not be used for the determination of chlorine alone.

NOTE 1—For the determination of chlorine, reference should be made to ASTM Method D 808, Test for Chlorine in New and Used Petroleum Products (Bomb Method,² or ASTM Method D 1317, Test for Chlorine in New and Used Lubricants (Sodium Alcoholate Method).²

1.4 The method gives erroneous results when applied to materials containing phosphorus and many metallo-organic compounds. Organic nitrogen compounds in the concentrations usually encountered in petroleum products do not interfere; however, nitrogen in concentrations higher than 1 percent may cause slightly high sulfur values owing to formation of nitric acid during the combustion.

NOTE 2—The determination of sulfur in the presence of such interfering substances should be made by means of ASTM Method D 129, Test for Sulfur in Petroleum Products by the Bomb Method.²

2. Summary of Method

2.1 The sample is vaporized and burned in a stream of air, and the oxidation completed by passing over quartz particles maintained at a temperature of 950 to 1000 C. The combustion products are passed through hydrogen peroxide which absorbs the sulfur as sulfuric acid and the chlorine as hydrochloric acid. The absorbent is then analyzed for total acidity and for chloride ion.

3. Apparatus

3.1 *Combustion Tube*, made of transparent quartz as described in the appendix, and assembled as shown in Fig. 1. The portion enclosed by dotted lines in Fig. 1 shall be heated by an electric furnace which shall be capable of maintaining that portion of the tube at a temperature not lower than 950 C. The perforated quartz plate nearest the point of entry of the sample shall be flush with or not more than 10 mm outside of the end of the furnace.

3.2 *Absorbers and Spray Traps*, as described in the Appendix.

¹ This method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants.

Current edition effective Sept. 13, 1968. Originally issued 1958. Replaces D 1551 - 65 T.

² *Annual Book of ASTM Standards*, Part 23.