



Designation: D 1588 – 60 (Reapproved 1967)⁶

AMERICAN SOCIETY FOR TESTING AND MATERIALS

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Standard Methods of Test for

DISSOLVED AND GASEOUS HYDROGEN IN WATER¹

This Standard is issued under the fixed designation D 1588; 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.

⁶ NOTE 1—General editorial changes were made throughout in March 1973.

⁶ NOTE 2—Editorial changes were made deleting the word "industrial" in the title and text where appropriate in May 1973.

1. Scope

1.1 These methods cover the collection and measurement of dissolved and gaseous hydrogen in water. Two methods are given, as follows:

	Sections
Method A (Thermal Conductivity Method)	4 to 9
Method B (Volumetric Method)	10 to 16

1.2 Method A entails the separation of hydrogen and its measurement by thermal conductivity. Method B entails the separation of hydrogen and its measurement volumetrically.

2. Definitions

2.1 For definitions of terms used in these methods, refer to ASTM Definitions D 1129, Terms Relating to Water.²

3. Purity of Reagents

3.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.³ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.2 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to ASTM Specifications D 1193, for Reagent Water, Type IV.²

4. Sampling

4.1 Collect the sample in accordance with

the applicable ASTM method, as follows:

- D 510—Sampling Water.²
- D 860—Sampling Water from Boilers.²
- D 1066—Sampling Steam.²

METHOD A (THERMAL CONDUCTIVITY METHOD)

5. Application

5.1 This method is especially suitable for the accurate measurement of low concentrations of hydrogen in steam condensates but may be extended to other industrial waters of similar character.

6. Summary of Method

6.1 Dissolved and gaseous hydrogen are scrubbed with air from a sample that has been cooled or warmed to a standard temperature. The thermal conductivity of the mixture of air and hydrogen, saturated with water, is compared with the thermal conductivity of air, saturated with water. The difference in thermal conductivities causes imbalance of a Wheatstone bridge that is a part of the instrument that measures, indicates, and records the hydrogen concentration in the sample.

¹ These methods are under the jurisdiction of ASTM Committee D-19 on Water.

Current edition effective Sept. 19, 1960. Originally issued 1958. Replaces D 1588 – 58 T.

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

³ "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, D.C. For suggestions on the testing of reagents not listed by the American Chemical Society, see "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, N.Y., and the "United States Pharmacopeia."