



Standard Test Method for Methanol Content of Formaldehyde Solutions¹

This standard is issued under the fixed designation D2380; 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. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This test method provides for the calculation of the methanol content of commercially available 37 % formaldehyde solutions and is based on the relationship of specific gravity to formaldehyde and methanol content.² Separate equations are given for three ranges of methanol: 0 to 2 %, 6 to 8 %, and 12 to 15 %.

1.2 For purposes of determining conformance of an observed or a calculated value using this test method to relevant specifications, test result(s) shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 For hazard information and guidance, see the supplier’s Material Safety Data Sheet.

1.5 *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.* Specific hazard statements are given in Section 4.

2. Referenced Documents

2.1 *ASTM Standards:*³

D268 Guide for Sampling and Testing Volatile Solvents and Chemical Intermediates for Use in Paint and Related Coatings and Material

D2194 Test Method for Concentration of Formaldehyde Solutions

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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² Walker, J. F., *Formaldehyde*, 3rd edition, 1964, pp. 86–91.

³ 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.

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

3. Significance and Use

3.1 This test method provides a measurement of methanol content of formaldehyde solutions. The results of these measurements can be used for specification acceptance.

3.2 This test method is applicable to 37 % formaldehyde solutions containing 0 to 2 %, 6 to 8 %, or 12 to 15 % methanol.

4. Hazards

4.1 Formaldehyde and formaldehyde solutions are hazardous. Minimize exposure and contact to avoid acute effects and possible sensitizing. Consult the supplier’s Material Safety Data Sheet for specific hazard information.

5. Procedure

5.1 Determine the apparent specific gravity of the material by a method that is accurate to the fourth decimal place, the temperature of both the specimen and the water being 25°C. See Guide D268.

5.2 Determine the formaldehyde content of the material in accordance with Test Method D2194.

6. Calculation

6.1 Calculate the methanol content as follows using the appropriate equation for the expected methanol range:

6.1.1 0 to 2 % Methanol:

$$\text{Methanol, wt \%} = (1.0017 + 0.003F - D) / 0.00253 \quad (1)$$

6.1.2 6 to 8 % Methanol:

$$\text{Methanol, wt \%} = (1.0015 + 0.003F - D) / 0.00250 \quad (2)$$

6.1.3 12 to 15 % Methanol:

$$\text{Methanol, wt \%} = (1.0210 + 0.0025F - D) / 0.00257 \quad (3)$$

where:

F = formaldehyde content, weight %, and
 D = specific gravity at 25/25°C.

NOTE 1—The numerical factors were calculated from the slope of the methanol curve of a nomograph relating specific gravity at 25/25°C to methanol-formaldehyde content.

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

7. Report

7.1 Report the methanol content to the nearest 0.1 %.

8. Precision and Bias

8.1 In an interlaboratory study of this test method, the within-laboratory standard deviation was found to be 0.10 % absolute with 28 degrees of freedom and the between-laboratories standard deviation 0.16 % absolute with 12 degrees of freedom based on these standard deviations, the following criteria should be used for judging the acceptability of results at the 95 % confidence level:

8.1.1 *Repeatability*—Two results, each the mean of duplicates, obtained by the same analyst on different days should be considered suspect if they differ by more than 0.3 % absolute.

8.1.2 *Reproducibility*—Two results, each the mean of duplicates, obtained by analysts in different laboratories, should be considered suspect if they differ by more than 0.5 % absolute.

NOTE 2—The above precision estimates are based on two interlaboratory studies involving five and nine laboratories respectively, using two different samples in each case, with a single analyst performing duplicate runs on each of two days. The methanol levels studied were 1.5, 6.5, and 14.3 %.

8.2 *Bias*—Bias of this test method has not been determined because primary standards do not exist.

9. Keywords

9.1 formaldehyde; methanol

SUMMARY OF CHANGES

Subcommittee D01.35 has identified the location of selected changes to this standard since the last issue (D2380 – 99) that may impact the use of this standard.

- (1) Added reference to Practice E29 in 1.2 of the Scope section. Documents.
(2) Added reference to Practice E29 in 2.1 of Referenced

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