



# Standard Test Method for Methanol Wall Wash of Marine Vessels Handling Polyester Grade Monoethylene Glycol<sup>1</sup>

This standard is issued under the fixed designation E2664; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This test method covers the methanol wall wash procedure and the chemical and physical analysis of the wall wash sampling for cargo tanks of marine vessels handling polyester grade monoethylene glycol. The key sections for the wall wash procedure and test methods appear in the following order:

	Sections
Wall Wash Procedure	7 and 8
Appearance	9 – 11
Color	12 – 14
Hydrocarbons	15 – 17
Chloride	18 – 21

1.2 The values given in SI units are to be considered as the standard. No other units of measurement are included in this standard.

1.3 Review the current Safety Data Sheet (SDS) for detailed information concerning toxicity, first aid procedures and safety precautions.

1.4 *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 hazard statements, see Section 6.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

[D1193 Specification for Reagent Water](#)

[D1209 Test Method for Color of Clear Liquids \(Platinum-Cobalt Scale\)](#)

[D1722 Test Method for Water Miscibility of Water-Soluble Solvents](#)

[D4176 Test Method for Free Water and Particulate Contami-](#)

[nation in Distillate Fuels \(Visual Inspection Procedures\)](#)  
[D5386 Test Method for Color of Liquids Using Tristimulus Colorimetry](#)

[E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals \(Withdrawn 2009\)](#)<sup>3</sup>

[E2469 Test Method for Chloride in Mono-, Di- and Triethylene Glycol by Ion Chromatography](#)

[E2680 Test Method for Appearance of Clear, Transparent Liquids \(Visual Inspection Procedure\)](#)

## 3. Significance and Use

3.1 The methanol wall wash test is performed to determine the cleanliness and suitability of cargo tanks or compartments on a marine vessel prior to loading polyester grade monoethylene glycol. Polyester grade monoethylene glycol has very high quality requirements and must be handled with care, as it is adversely affected by oxygen, hydrocarbons, water and chloride. It is especially susceptible to aromatic contamination, which degrades UV transmittance. Possible sources of contamination are the prior cargoes and cleaning agents. The methanol wall wash procedure provides a representative sampling of the impurities and contamination present on the sides of the cargo tank.

3.2 The test methods used for analysis of the methanol wall wash samples are capable of determining low levels of impurities or contamination in methanol. These tests include appearance, color, hydrocarbons and chloride. The producers of polyester grade monoethylene glycol need confirmation of the cleanliness and suitability of the marine vessel's tanks prior to loading with in-specification material. Cargo tanks that do not pass the wall wash test should not be loaded.

3.3 Alternative test methods and technology for several of the methods can be found in the Appendix. The alternative test methods do not have precision data for the application of these methods in analyzing methanol. Use of these methods is optional and individuals using the alternative methods should assure themselves that the method is sufficiently precise. Precision data is only for the original test methods listed.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](http://www.astm.org).

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.16 on Industrial and Specialty Product Standards.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

#### 4. Purity of Reagents

4.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society (ACS) where such specifications are available.<sup>4</sup> 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.

4.2 *High-Purity Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water as defined by Type II of Specification **D1193**. It is recommended that all water be filtered through a 0.2- $\mu$ m filter.

4.3 *Methanol*, ACS reagent grade with very low concentrations of chloride.

NOTE 1—Chloride in high purity methanol used for preparation of the chloride working standards should not exceed 0.01 mg/kg. This information should be provided by the supplier or determined by the analyst before use.

#### 5. Quality Control

5.1 It is recommended that a control chart for the concentration of chloride in a methanol wall wash quality control sample be established and maintained according to common guidelines.<sup>5</sup> Measure the control sample each time a test sample(s) is tested. If the measured value exceeds the action limit of the control chart, take appropriate action before proceeding with sample tests.

#### 6. Hazards

6.1 Each analyst must be acquainted with the potential hazards of the equipment, reagents, products, solvents and procedures before beginning laboratory work. Sources of information include: operation manuals, SDS, literature, and other related data. Safety information should be requested from the supplier. Disposal of waste materials, reagents, reactants, and solvents must be in compliance with laws and regulations from all applicable governmental agencies.

6.2 Methanol is a flammable and toxic substance. Methanol is absorbed through the skin and by breathing the vapors. Be careful when handling a flammable solvent and work in a well-ventilated area away from sources of ignition. Use the proper Personal Protective Equipment (PPE) to minimize exposure.

<sup>4</sup> *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USP), Rockville, MD.

<sup>5</sup> ASTM Manual on Presentation of Data and Control Chart Analysis, 7th Edition, ASTM Services MNL 7A (revision of Special Technical Publication (STP) 15D).

### METHANOL WALL WASH

#### 7. Procedure

7.1 All equipment must be clean and rinsed with reagent grade, low chloride methanol to prevent chloride contamination of the sample.

7.2 Pour approximately 1 L of reagent grade, low chloride methanol into a 1-L plastic squeeze bottle.

7.3 Use a plastic funnel that has been cut flat on one side to catch the methanol. The funnel and 1-L sample bottle should be rinsed with reagent grade, low chloride methanol immediately before sampling.

7.4 Clean, chemical resistant gloves and eye protection should be worn for personal protection and to prevent contamination of the samples.

7.5 Do not test wet areas of a cargo tank. The tank must be dry before conducting the wall wash tests. The tank is not acceptable for testing if wet areas are more than a few spots.

7.6 Choose two sites on each tank wall (bulkhead) approximately 15 to 20 cm wide and as high as possible (approximately 2 m high). Start spraying methanol on the wall with the spray bottle approximately 15 cm from the wall. Collect the methanol with the special funnel into a clean 1-L glass bottle with the funnel placed at least 0.3 to 0.6 m below the spray. Continue spraying methanol while moving down the wall until approximately 0.6 m from the bottom. Use approximately 200 mL of methanol on each of the four sides of the tank. Be consistent with the spraying and collecting of the methanol. Do not scrap the tank wall with the funnel when collecting the methanol.

7.7 Include “non-typical” areas, such as discolored patches, lining breaks and exposed metal. If the “non-typical” areas are less than 20 % of the tank surface, include them in the four areas normally tested. If they are more than 20 % of the tank surface, test them separately.

7.8 Test separately any areas having crystalline deposits.

7.9 Collect the methanol from the four sides of a tank into the same sample bottle. Cap the bottle, label from which cargo tank it was taken and transport to the laboratory for analysis.

7.10 Include a sample of the methanol used in the wall wash procedure. This is the analytical “blank”. This methanol will be analyzed with the tank samples and the results of the “blank” will be subtracted from each tank’s wall wash sample’s results.

#### 8. Analysis

8.1 The methanol wall wash samples shall be analyzed for the following:

1. Appearance	Clear and bright (pass)
2. Color	10 Pt/Co, maximum
3. Hydrocarbons	None by test (pass)
4. Chloride	0.5 mg/kg, maximum