

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 344
AUTOMOTIVE WINDSHIELD WASHER FLUID**

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Adopted 02/15/95
Revised 04/03/96
Revised 04/07/99
Revised 09/25/13

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**RULE 344
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SECTION 100 – GENERAL

- 101 PURPOSE:** To limit the emission of volatile organic compounds (VOCs) into the ambient air from automotive windshield washer fluid products.
- 102 APPLICABILITY:** This rule applies to any automotive windshield washer fluid product sold or otherwise distributed within Maricopa County.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 (General Provisions and Definitions) of these rules. In the event of any inconsistency between any of the Maricopa County Air Pollution Control Rules, the definitions in this rule take precedence.

- 201 AUTOMOTIVE WINDSHIELD WASHER FLUID (WINDSHIELD FLUID):** Any liquid designed for use in a motor vehicle windshield washer fluid system either as an antifreeze or for the purpose of cleaning, washing, or wetting windshield(s), except any such liquid which is placed in a new motor vehicle at the time the vehicle is manufactured.
- 202 LABEL:** Any written, printed, or graphic matter affixed to, applied to, blown into, formed, molded into, embossed on, or appearing upon any product container or package, for purposes of branding, identifying, or giving information with respect to the product or the contents of the package.
- 203 PERCENT BY WEIGHT:** The total weight of a substance expressed as a percentage of the net weight of the product exclusive of the container or package as calculated according to the following equation:

$$\text{Percent by Weight} = \frac{B \times 100}{A}$$

Where:

A = net weight of unit (excluding container and packaging)

B = weight of VOCs, as defined in Section 205 of this rule

SECTION 300 – STANDARDS

- 301 LIMITATIONS–PERCENT VOC BY WEIGHT:** No person shall sell, offer for sale, or supply in Maricopa County, Arizona any automotive windshield washer fluid product which, at the time of sale, offering, or supply, contains VOCs in excess of ten percent by weight, unless the person can demonstrate that the windshield fluid meets the exemption in Section 302, or the fluid is destined for use outside Maricopa County, as provided for by the exemption in Section 303.
- 302 EXEMPTION–CONCENTRATED WINDSHIELD FLUID PRODUCTS:** A concentrated windshield fluid (concentrate) is exempt from Section 301 of this rule if the label provides all of the following information:
- a. That the windshield washer fluid is a concentrate;
 - b. That the contents must be diluted prior to use;
 - c. Specific, clearly designated dilution directions;
 - d. That the freezing point of the undiluted product is not described on the label; and
 - e. That the dilution ratio of the concentrate shall yield a solution that never exceeds ten percent VOC by weight.
- 303 EXEMPTION–OUTSIDE OF MARICOPA COUNTY:** A person may demonstrate that windshield fluid sold, offered for sale or supplied within Maricopa County is destined for use outside Maricopa County by providing the following documents or information:
- a. A bill of lading, or
 - b. A properly executed, signed transfer agreement, such as a warehouse receipt, orders for the delivery of goods, and any other documents common in such transactions which in the regular course of business or financing are treated as adequately evidencing that the person in possession of it is entitled to receive, hold and dispose of the document and the goods it covers.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS (NOT APPLICABLE)

SECTION 500 – MONITORING AND RECORDS

- 501 COMPLIANCE DETERMINATION:** Compliance determination may be demonstrated by either one of the options listed below. Copies of the test method listed in subsection 501.2 and found in Appendix A are available at the Maricopa County Air Quality Department, 1001 N. Central Ave., Phoenix, AZ, 85004.
- 501.1** Formulation data based upon written certification from the manufacturer specifying the actual weight percentage of VOCs in the windshield washer fluid.
- 501.2 Test Method:** Maricopa County Reference Method #100, which is entitled: “Total Organic Carbon for Windshield Washer Fluids,” as found in Appendix A of this rule.
- 502 CONTESTED RESULTS:** The Control Officer may direct the owner or operator to perform the testing method listed in subsection 501.2 if there is reason to believe that the formulation information is incorrect. If there is an inconsistency between the formulation

certification and the actual test method results, the test method shall prevail as the definitive method in all cases.

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APPENDIX A

Test Method #100 for Determining Total Organic Carbon for Windshield Washer Fluids

1.0 APPLICABILITY AND PRINCIPLE

- 1.1 Applicability.** This method is applicable for the determination of organic carbon in diluted windshield washer fluids.
- 1.2 Principle.** Organic carbon in a sample is converted to carbon dioxide (CO₂) by catalytic combustion or wet chemical oxidation. The CO₂ formed can be measured directly by an infrared detector or converted to methane (CH₄) and measured by a flame ionization detector. The amount of CO₂ or CH₄ is directly proportional to the concentration of carbonaceous material in the sample.

2.0 SENSITIVITY AND INTERFERENCES

- 2.1 Sensitivity.** The method is most applicable to measurement of organic carbon above 1mg/L.
- 2.2 Interferences.** All distilled water used in making and/or diluting the samples must be acidified with concentrated phosphoric acid H₃PO₄ (1 mL of H₃PO₄/1 L of water) and purged with inert gas (He, N₂...) for at least 30 minutes. Inject this water into the Total Organic Carbon analyzer and determine the total concentration (ppm C) of the blank. This method is sufficient for removing most interferences due to inorganic carbon in the water. Do not purge the sample with an inert gas since purging may result in the loss of volatile organic substances.

3.0 APPARATUS

- 3.1 Blender.** Waring-type or similar, for blending or homogenizing samples.
- 3.2 Total Organic Analyzer.** An analyzer capable of measuring carbonaceous material in liquid samples. Consideration should be given to the types of samples to be analyzed, the expected concentration range, and forms of carbon to be measured.
- 3.3 Volumetric Flasks and Volumetric Pipets.** For preparing standard solutions and the windshield washer fluid solutions.
- 3.4 Glass Bottles.** For sample collection and storage.

4.0 REAGENTS

- 4.1 Water (H₂O).** Distilled water used in preparation of standards and for dilution of samples should be ultra-pure to reduce the carbon concentration of the blank. Carbon dioxide-free, double distilled water is recommended. Ion exchanged waters

are not recommended because of the possibilities of contamination with organic materials from the resins.

- 4.2 **Potassium Hydrogen Phthalate (HOCC₆H₄COOK), Stock Solution.** 1000 mg carbon/L. Dissolve 0.2128g of potassium hydrogen phthalate (Primary Standard Grade) in distilled water and dilute to 100.0 mL.
- 4.3 **Potassium Hydrogen Phthalate, Standard Solutions.** Prepare standard solutions from the stock solution by dilution with distilled water.
- 4.4 **Blank Solution.** Use the same distilled water (or similar quality water) used for the preparation of the standard solutions.

5.0 SAMPLE PREPARATION

- 5.1 Prepare the windshield washer fluid according to the manufacturer's directions.
- 5.2 Dilute the windshield washer fluids with H₂O to be within the calibrated range of the instrument before analyzing. Dilutions of 1 to 100 or greater may be necessary before windshield washer solutions can be analyzed.

6.0 PROCEDURE

- 6.1 Follow instrument manufacturer's instructions for calibration, procedure, and calculations.
- 6.2 Calibrate using at least 3 standards. The set of calibration standards should consist of one below the expected concentration, one above the expected concentration, and approximately at the expected concentration.
- 6.3 Calculate and report the results as mg C/g sample.

8.0 BIBLIOGRAPHY OF REFERENCE DOCUMENTS: The Control Officer will rely on the following background materials when questions arise in the review and implementation of the test method listed in subsection 501.2:

- 8.1 Annual Book of ASTM Standards, Part 31, "Water", Standard D 2574-79, p 469, (1976).
- 8.2 Standard Methods for the Examination of Water and Wastewater, 14th Edition, p 532, Method 505, (1975).
- 8.3 Method 415.1, Methods for Chemical Analysis of Water and Wastes, Environmental Monitoring and Support Laboratory, USEPA, Cincinnati, OH 45268, EPA 600/4-79-020.
- 8.4 Evaluation of Method 415.1 for Off-set Lithographic Solutions, September, 1992.