



Standard Practice for Identification of Waterborne Oils¹

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1. Scope*

1.1 This practice covers the broad concepts of sampling and analyzing waterborne oils for identification and comparison with suspected source oils. Detailed procedures are referenced in this practice. A general approach is given to aid the investigator in planning a program to solve the problem of chemical characterization and to determine the source of a waterborne oil sample.

1.2 This practice is applicable to all waterborne oils taken from water bodies, either natural or man-made, such as open oceans, estuaries or bays, lakes, rivers, smaller streams, canals; or from beaches, marshes, or banks lining or edging these water systems. Generally, the waterborne oils float on the surface of the waters or collect on the land surfaces adjoining the waters, but occasionally these oils, or portions, are emulsified or dissolved in the waters, or are incorporated into the sediments underlying the waters, or into the organisms living in the water or sediments.

1.3 This practice as presently written proposes the use of specific analytical techniques described in the referenced ASTM standards. As additional techniques for characterizing waterborne oils are developed and written up as test methods, this practice will be revised.

1.4 *This standard does not purport to address 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.*

2. Referenced Documents

2.1 ASTM Standards:

- D 1129 Terminology Relating to Water²
- D 3325 Practice for Preservation of Waterborne Oil Samples³
- D 3326 Practice for Preparation of Samples for Identification of Waterborne Oils³

¹ This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.06 on Methods for Analysis for Organic Substances in Water.

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² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 11.02.

- D 3328 Test Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography³
- D 3414 Test Method for Comparison of Waterborne Petroleum Oils by Infrared Spectroscopy³
- D 3650 Test Method for Comparison of Waterborne Petroleum Oils by Fluorescence Analysis³
- D 4489 Practices for Sampling of Waterborne Oils³
- D 4840 Guide for Sampling Chain of Custody Procedures²
- D 5037 Test Method for Comparison of Waterborne Petroleum Oils by High Performance Liquid Chromatography³
- D 5739 Practice for Oil Spill Source Identification by Gas Chromatography and Positive Ion Electron Impact Low Resolution Mass Spectrometry³
- E 620 Practice for Reporting Opinions of Technical Experts⁴

3. Terminology

3.1 Definitions:

3.1.1 *waterborne oil*—any oil, whether or not derived from petroleum, carried by a water system (for example, ocean, bay, lake, river, etc.) usually at the surface but occasionally emulsified or dissolved in the water. The waterborne oil can also be found on beaches or banks edging the water body, in the sediments underlying the water, or in the organisms living in the water or in the sediments.

3.2 For definitions of other terms used in this practice, refer to Terminology D 1129, and to Practices D 3325, D 3326, D 4489, and D 5739, and Test Methods D 3328, D 3650, and D 5037.

4. Significance and Use

4.1 Oil from one crude oil field is readily distinguishable from another, and differences in the makeup of oils from the same crude oil field can often be observed as well. Refined oils are fractions from crude oil stocks, usually derived from distillation processes. Two refined oils of the same type differ because of dissimilarities in the characteristics of their crude oil feed stocks as well as variations in refinery processes and any subsequent contact with other oils mixed in during transfer operations from residues in tanks, ships, pipes, hoses, etc.

⁴ Annual Book of ASTM Standards, Vol 14.02.

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