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Standard Guide for Ecological Considerations for the Use of Surface Washing Agents: Impermeable Surfaces[1]

This standard is issued under the fixed designation F1280; 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 guide covers the use of surface washing agents to assist in the cleanup of oil spills. This guide is written with the goal of minimizing the environmental impacts of oil spills; this goal is the basis on which the recommendations are made. Aesthetic and socioeconomic factors are not considered although these and other factors are often important in spill response.

1.2 In making surface washing agent use decisions, appropriate government authorities should be consulted as required by law.

1.3 Spill responders have available several means to control or clean up spilled oil. In this guide, the use of chemical surface washing agents is considered.

1.4 This is a general guide only. Oil, as used in this guide, includes crude oils and refined petroleum products. Differences between individual surface washing agents or between different oil products are not considered.

1.5 This guide applies only to impermeable surfaces.

1.6 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1279 Guide for Ecological Considerations for the Restriction of the Use of Surface Washing Agents: Permeable Land Surfaces

F1872 Guide for Use of Chemical Shoreline Cleaning Agents: Environmental and Operational Considerations

3. Terminology

3.1 *Definitions:*

3.1.1 *permeability*—the capacity of the surface to conduct or transmit liquids such as water. An impermeable surface would not transmit water in a short time (minutes).

3.1.2 *surface*—the top or cover of the land at the site of interest.

3.1.3 *surface washing agents*—chemical substances, including surfactants, intended to loosen oil from surfaces. Surface washing agents do not include dispersants. (See Guide F1872 for details on the use of surface washing agents.)

4. Significance and Use

4.1 This guide is meant to aid local and regional response teams who may use it during spill response planning and spill events.

4.2 This guide should be adapted to site-specific circumstances.

5. Environment Covered—Impermeable Surfaces

5.1 Impermeable surfaces include any soil, rock, hard pan, or other natural surface that does not readily permit the passage of water and oil.

5.2 Impermeable surfaces include man-made surfaces such as paved roads and parking lots. (See Guide F1279 for permeable surfaces.)

5.3 The impermeable surface should allow for the containment and recovery of oil-contaminated water resulting from the cleaning process.

6. Background

6.1 Oil and surface washing agents will ultimately run off an impermeable surface (**1**, **2**).[3] The environment receiving runoff should be considered. As an example, experience with spills on impermeable surfaces included runoff into a permeable zone and extensive groundwater contamination.

[1] This guide is under the jurisdiction of ASTM Committee F20 on Hazardous Substances and Oil Spill Responseand is the direct responsibility of Subcommittee F20.13 on Treatment.

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[2] 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.

[3] The boldface numbers in parentheses refer to a list of references at the end of this standard.

6.2 A laboratory experiment has shown that explosion potential is increased by using surface washing agents on fuel spills in sewers (2, 3).

6.3 Studies of the toxicity of natural products such as d-limonene, from citrus peels, reveals that many of these have high aquatic toxicities, while showing little human toxicity (4, 5) The agent toxicity should be considered where unintentional run-off can affect biota.

7. Recommendations

7.1 Oil or dispersed oil on impermeable surfaces may run off to other environments and response should be planned for accordingly.

7.2 All runoff from surface washing operations on impermeable surfaces should be collected.

7.3 Surface washing agents should never be used if the runoff can reach groundwater, especially that used for drinking water.

8. Keywords

8.1 impermeable; land; oil spill; oil spill surface washing agents; road surfaces; surface washing agents

REFERENCES

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(2) Smith, A. J., "Success and Failures with Oil Spills in Southeastern Inland Waters," *Proceedings of the 1973 Conference on Prevention and Control of Oil Spills* , American Petroleum Institute, Washington, DC, 1973, pp. 583–588.

(3) Fingas, M. F., Hughes, K. A., and Bobra, A. M., "The Behaviour of Dispersed and Nondispersed Fuels in a Sewer System," *Oil Dispersants: New Ecological Approaches, ASTM STP 1018*, ASTM, 1989, pp. 274–289.

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(5) Walker, A. H., Kucklick, J. H., and Michel, J.J., Effectiveness and Environmental Considerations for Non-dispersant Chemical Countermeasures, *Pure and Applied Chemistry* , Vol 71, No. 1, 1999, pp. 67–81.