



Standard Guide for In-Situ Burning of Spilled Oil: Ignition Devices¹

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1. Scope

1.1 This guide relates to the use of in-situ burning of spilled oil. The focus of the guide is in-situ burning of oil on water, but the ignition techniques and devices described in the guide are generally applicable to in-situ burning of oil spilled on land as well.

1.2 The purpose of this guide is to provide information that will enable oil-spill responders to select the appropriate techniques and devices to successfully ignite oil spilled on water.

1.3 This guide is one of four related to in-situ burning of oil spills. Guide **F1788** addresses environmental and operational considerations. Guide **F2152** addresses fire-resistant booms, and Guide **F2230** addresses burning in ice conditions.

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 to determine the applicability of regulatory limitations prior to use.* In particular, the storage, transport, and use of ignition devices may be subject to regulations that will vary according to the jurisdiction. While guidance of a general nature is provided herein, users of this guide should determine regulations that apply to their situation.

2. Referenced Documents

2.1 ASTM Standards:²

D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

D975 Specification for Diesel Fuel Oils

F1788 Guide for In-Situ Burning of Oil Spills on Water: Environmental and Operational Considerations

F2152 Guide for In-Situ Burning of Spilled Oil: Fire-Resistant Boom

¹ This guide is under the jurisdiction of ASTM Committee **F20** on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee **F20.15** on In-Situ Burning.

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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.

F2230 Guide for In-situ Burning of Oil Spills on Water: Ice Conditions

3. Terminology

3.1 Definitions:

3.1.1 *fire point*—the lowest temperature at which a specimen will sustain burning for 5 s. (**Test Method D92**)

3.1.2 *flash point*—the lowest temperature corrected to a barometric pressure of 101.3 kPa (760 mm Hg), at which application of a test flame causes the vapor of a specimen to ignite under specified conditions of test. (**Test Method D92**)

4. Significance and Use

4.1 This guide describes the requirements for igniting oil for the purpose of in-situ burning. It is intended to aid decision-makers and spill-responders in contingency planning, spill response, and training, and to aid manufacturers in developing effective ignition devices.

4.2 This guide describes criteria for the design and selection of ignition devices for in-situ burning applications.

4.3 This guide is not intended as a detailed operational manual for the ignition and burning of spilled oil.

5. Overview of the Requirements for Igniting Spilled Oil on Water

5.1 The focus of this section is on the in-situ combustion of marine oil spills.

5.2 Successful ignition of oil on water requires two components: heating the oil such that sufficient vapors are produced to support continuous combustion, and then, providing an ignition source to start burning. The temperature at which the oil produces vapors at a sufficient rate to ignite is called the flash point. At a temperature above the flash point, known as the fire point, the oil will produce vapors at a rate sufficient to support continuous combustion.

5.3 For light refined products, such as gasoline and some unweathered crude oils, the fire point may be in the range of ambient temperatures, in which case, little if any, preheating would be required to enable ignition. For other oil products, and particularly those that have weathered or emulsified, or both, the fire point will be much greater than ambient temperatures, and substantial preheating will be required.