



Standard Guide for Reporting of Test Performance Data for Oil Spill Response Pumps¹

This standard is issued under the fixed designation F 1607; 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 is intended as a guideline for the standardized reporting of performance data of pumps and pump systems that may be considered for use in oil spill response operations. The present objective is to develop a reporting guideline to aid in the comparative evaluation of various devices.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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:

D 2196 Test Method for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer²

F 631 Guide for Collecting Skimmer Performance Data in Controlled Environments³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *oil spill response pump*—devices used to transfer oil, oil and water mixtures, and emulsions. These include centrifugal pumps, positive displacement pumps, vacuum pumps, and other systems.

3.1.2 *pump system*—the principal fluid moving device, including the prime mover, associated hose and fittings, and associated equipment such as debris handling devices that are normally used during oil spill response operations.

4. Significance and Use

4.1 The performance criteria listed in this guide will provide guidance in the selection of oil spill pumping equipment.

4.2 This guide has been developed for use by the following: manufacturers of pumping systems who wish to establish a common means of evaluating and reporting the performance characteristics of their products; and existing or potential users of pumping systems who wish to compare the performance characteristics of various products.

5. Test Fluids: Suggested Test Fluid Viscosities

5.1 A selection of test fluids from the following viscosity ranges is recommended and should include an adequate number of data points to display the pump's performance over the intended range of operation. It is recommended that the test fluids include one selection from each of the four ranges listed in Table 1, depending on the intended service of the pump. In particular, three viscosity targets are recommended to allow comparisons with skimmer test data (Guide F 631), namely, 200, 2000, and 60 000 cSt.

5.2 For the tests described in 6.3-6.6, use hydrocarbon-based single-viscosity oils or mixtures of high- and low-viscosity hydrocarbons, or both, at various temperatures to achieve test viscosities. Higher viscosities, such as those in Category 4, may require the use of emulsions. Note that, when using high-viscosity fluids, care must be taken in interpreting the test results due to two-phase flow considerations. The test fluid viscosity should be identified by measurements at shear rates of 1, 10, and 50 s⁻¹ (Test Method D 2196).

6. Categories of Tests for Pump Performance

6.1 *Suction and Discharge Hoses*—Each of the following tests (6.3-6.5) should be conducted using suction and discharge hoses that are the same diameter as the respective pump inlet and discharge fittings.

6.2 *Equipment Specifications*—For each of the following performance tests, report the equipment specifications, including the following: pump model; prime mover model; prime mover type (that is, hydraulic, electrical, air, etc.); prime mover characteristics (that is, hydraulic, discharge pressure and flowrate; electrical, voltage and current; and air, pressure and flowrate) under operating conditions; mechanical efficiency of the prime mover; hose and fitting size(s); and pump speed range (r/min). Also report the physical and operating specifications of the pump, including the following: size, weight, required fuel, ancillary equipment, submersible and non-submersible service, fittings, etc.

¹ This guide is under the jurisdiction of ASTM Committee F-20 on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee F20.12 on Removal.

Current edition approved Aug. 15, 1995. Published October 1995.

² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 11.04.