



Standard Guide for Recordkeeping Microfiltration and Ultrafiltration Systems¹

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1. Scope

1.1 This guide covers procedures for well-defined recordkeeping of microfiltration (MF) and ultrafiltration (UF) systems.

1.2 This guide includes a start-up report, recordkeeping of MF/UF operating data, recordkeeping of pretreatment operating data, and a maintenance log.

1.3 This guide is applicable to waters including surface water, ground water and some wastewater (secondary effluent) but is not applicable to membrane bioreactors or process streams.

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 determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D1125 Test Methods for Electrical Conductivity and Resistivity of Water

D1129 Terminology Relating to Water

D1253 Test Method for Residual Chlorine in Water

D4195 Guide for Water Analysis for Reverse Osmosis and Nanofiltration Application

D5090 Practice for Standardizing Ultrafiltration Permeate Flow Performance Data

D6161 Terminology Used for Microfiltration, Ultrafiltration, Nanofiltration and Reverse Osmosis Membrane Processes

D6698 Test Method for On-Line Measurement of Turbidity Below 5 NTU in Water

D6908 Practice for Integrity Testing of Water Filtration Membrane Systems

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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. Terminology

3.1 *Definitions*—For definitions of terms used in this guide, refer to Terminologies D1129 and D6161.

3.2 *Definitions of Terms Specific to This Standard*—For description of terms relating to MF/UF, refer to Practice D5090.

4. Significance and Use

4.1 Proper operation and maintenance of an MF or UF system are key factors in obtaining successful performance. This guide provides the necessary input for the evaluation of the performance of the MF/UF system, the pretreatment system, and the mechanical equipment in the plant.

4.2 This guide is for general guidance only and must not be used in place of the operating manual for a particular plant.

4.3 Site-dependent factors prevent specific recommendations for all recordkeeping. Thus, only the more general recordkeeping is covered by this guide.

4.4 This guide can be used for both surface and ground water and systems which contain either spiral-wound or hollow-fiber devices.

5. Procedure

5.1 Start-Up Report:

5.1.1 Provide a complete description of the plant. This can be done by using a flow diagram and equipment, instrumentation, and material lists to show water source, pretreatment system, configuration, and posttreatment system.

5.1.2 Record initial performance of pretreatment systems as provided in 5.2 and 5.3, respectively.

5.1.3 Calibrate all gauges and meters based on manufacturers' recommendations.

5.2 MF/UF Operating Data:

5.2.1 Record the permeate and reject volume or flow rate from the system.

5.2.2 Record the feed, permeate, and transmembrane pressures of each skid as applicable.

5.2.3 Record the water temperature of the feed or permeate stream.

5.2.4 Record the pH of the feed or permeate stream.

5.2.5 Record the turbidity of the feed, and permeate, streams. When possible, permeate turbidity should be recorded

for each skid. For turbidity measurement use Test Method **D6698** (nephelometric turbidity).

5.2.6 Record the hours of operation whenever data are collected.

5.2.7 Calibrate all gauges and meters based on manufacturer's recommendation as to method and frequency, but no less frequent than once every three months.

5.2.8 Record any unusual incidents, for example, upsets in turbidity, pH and pressure, and shut-downs.

5.2.9 Complete water analyses of the feed and permeate streams and the raw water as appropriate to the application shall be obtained at start-up and every three months thereafter.

NOTE 1—For all analyses, use ASTM test methods referenced in Guide **D4195**.

5.2.10 The recommended frequency of data collection is given in **Table 1**.

5.3 Pretreatment Operating Data:

TABLE 1 Recommended Frequency of Data Collection

NOTE 1—If the system does not contain an automated SCADA system, manual readings should be recorded on a 4-h frequency.

	Every 8 h	Daily	Continuous	Monthly
Flows	X ^A	X	X	
Pressures	X ^A	X	X	
Temperature	X ^A	X	X	
pH	X ^A	X	X	
Turbidity	X ^A	X	X	
Membrane integrity (D6908)	X	X	X	
Unusual incidences	on occurrence			

^A The application of the MF/UF system and its operator coverage will determine a practical frequency.

5.3.1 Record the operating characteristics of the pretreatment equipment. Since pretreatment is site dependent, specific recommendations for all record keeping cannot be given.

5.3.2 Record discharge pressure of any well or feed pumps twice a day.

5.3.3 Record inlet and outlet pressure of all pre-filters twice a day.

5.3.4 If used, record consumption of acids, bases, oxidants, coagulants or any other chemicals as applicable once a day.

5.3.5 Calibrate all gauges and meters based on manufacturer's recommendations as to method and frequency, but no less frequent than once every three months.

5.3.6 Record any unusual incidents, for example, upsets and shutdowns, as they occur.

5.4 Maintenance Log:

5.4.1 Record routine maintenance.

5.4.2 Record mechanical failures and replacements.

5.4.3 Record replacements or additions of devices.

5.4.4 Record calibrations of all gauges and meters.

5.4.5 Record replacement or additions of pretreatment equipment, for example, cartridge filters and include date, brand name, and nominal rating.

5.4.6 Record all cleanings of devices. Include date, duration of cleaning, cleaning agent(s) and concentration, solution pH, temperature during cleaning, flow rate, and pressures as applicable.

5.4.7 Record all integrity test results. Include test method, conditions and results of the test.

5.4.8 Record repairs of devices.

6. Keywords

6.1 microfiltration; operating data; recordkeeping; ultrafiltration

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