Summary of Substantive Changes
between the 2020, 2021 and the 2022 editions of
NSF/ANSI 244 "Supplemental Microbiological Water Treatment Systems - Filtration"

Presented to the IAPMO Standards Review Committee on March 13, 2022

General: The changes to NSF 244 may have an impact on currently listed products. The most substantive changes are:

- Microbiological reduction claims have been reduced from ≥ 6.5 log and 4.5 to ≥ 3 log.
- Drinking fountain outlets, the lower edge shall be 1" vs 2" above the flood rim.

Section 1, General:

1.1 Purpose

It is the purpose of this standard to establish minimum requirements for the reduction of microorganisms using mechanical filtration devices for supplemental treatment of microbiologically safe drinking water. Mechanical filtration devices covered by this standard are intended for use only on water supplies that have been treated to public water system standards or otherwise are determined to be microbiologically safe as demonstrated by routine testing. They are intended only for protection against intermittent incursions or accidental microbiological contamination of otherwise safe drinking water. This standard also specifies the minimum product literature and labeling information that a manufacturer shall supply to authorized representatives and system owners as well as the minimum service-related obligations that the manufacturer shall extend to system owners.

NOTE — This standard does not apply to products intended for use on water of unknown microbiological quality. For such applications, refer to the protocol NSF P231: Microbiological Water Purifiers.

1.2 Scope

The point-of-use (POU) and point-of-entry (POE) systems addressed by this standard are designed to be used for the supplemental microbial control of specific organisms that may occasionally be present in drinking water (public or private) because of intermittent incursions. Certain of these specific organisms that may be introduced into the drinking water are considered established or potential health hazards. This standard establishes requirements for POU and POE drinking water treatment systems, and the materials and components used in these systems.

NOTE — This standard does not apply to products intended for use on water of unknown microbiological quality. For such applications, refer to the protocol NSF P23.

Section 2, Normative references:

The following documents contain ~~provisions~~ requirements that, by reference in this text, constitute requirements of this standard. At the time of publication, the indicated editions were valid. All of the documents are subject to revision and parties are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

21 C.F.R., Food and Drugs, Subchapter B, Food for Human Consumption, Parts 170-199

APHA/AWWA/WEF, Standard Methods for the Examination of Water and Wastewater ~~20th edition~~ (hereinafter referred to as Standard Methods)
NSF/ANSI/CAN 372, Drinking Water System Components – Lead Content
NSF/ANSI/CAN 600, Health Effects and Evaluation Criteria for Chemicals in Drinking Water

Section 4, Materials:
4.1 Materials in contact with drinking water
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***4.1.2** POU drinking water treatment units shall conform to the protocol in this section and be evaluated for weighted average lead content in accordance with NSF/ANSI/CAN 372. The weighted average lead content of the contact materials and coated substrates shall be ≤ 0.25%.*

4.2 Materials evaluation
……..
***4.2.3.2** The system or component(s) shall be refilled with the exposure water specified in Section 4.2.2 and maintained for 24 h at a temperature of 23 ± 2°C (73 ± 3 °F). A ~~2 L~~ water sample shall then be collected in accordance with Section 4.2.3.3. The system or component(s) shall be flushed according to the manufacturer's instruction, refilled, and maintained for another 24 h at a temperature of 23 ± 2°C (73 ± 3 °F). F). A second ~~2 L~~ water sample shall be collected in accordance with Section 4.2.3.3. The system or component(s) shall again be flushed according to the manufacturer's instructions, refilled, and maintained for a third period of 24 h at a temperature of 23 ± 2°C (73 ± 3 °F). A third ~~2 L~~ water sample shall be collected in accordance with Section 4.2.3.3.*
***4.2.3.3** A ~~minimum sample~~ daily 2-L collection volume shall be collected ~~at each sample~~ point is recommended to ensure there is sufficient volume in the composite sample to conduct the requested analyses. If the water-holding volume of the product is greater than 2 L, the entire volume shall be collected in a suitable collection vessel, and a 2-L subsample obtained from this volume. If the water-holding volume of the product is less than 2 L, sufficient samples shall be exposed to provide ~~the required 2 L~~ at least 1/3 of the volume required for analysis of extractant water at each sample point. The maximum number of samples exposed shall not exceed 16 with 125 mL of extractant water drawn from each sample. If the components with a water-holding volume that is less than 250 mL, and is able to be identified as one that will only occur once in the flow path of dispensed treated water (such as diverters, faucets, RO shutoff valves, or specialty components), then a volume of 250 mL shall be drawn from each sample using a maximum number of eight samples.*

Section 6, Minimum performance requirements:
6.7 Product water dispensing outlets
Product water dispensing outlets other than drinking fountain outlets, if provided, shall be designed, constructed, and located so the discharge orifice is directed downward. ~~and t~~The lower edge of the outlet shall be at an elevation not less than 51 mm (2 in) above the flood rim of the waste receptacle.
……..
***6.7.1.4** The lower edge of the drinking water outlet shall be at least ~~51 mm (2 in)~~ 25 mm (1 in) above the flood rim of the waste receptacle.*

Section 7, Microbiological performance claims – Test methods

7.2 Microbiological reduction claims

Claims may be made for the following microbiological reduction:

— bacteria, viruses and cysts (see Section 7.2.2.2).

Separate claims for bacteria reduction or virus reduction shall not be allowed. The maximum reduction claim for bacteria and viruses shall each be limited to and stated as ≥ ~~6.5 log and ≥4.5~~ 3 log.

7.2.1 Bacteria and virus surrogate reduction

The system shall meet all of the following requirements when tested in accordance with Section 7.3:

— reduce a Raoultella terrigena (Rt) (ATCC #33257) target influent challenge of ~~50,000,000 (5×10^7) cfu/100 mL by at least 6 log (99.9999%);~~ 1 × 104 to 1 × 105 CFU/100 mL by at least 3 log (99.9%); and

— reduce a Fr (ATCC #15767-B1) and MS-2 (ATCC #15597-BI) viral surrogate target influent challenge having ~~5,000,000 (5 × 106) pfu/100 mL of each surrogate by at least 4 log (99.99%)~~ 1 × 104 to 1 × 105 CFU/mL of each surrogate by at least 3 log (99.9%).

7.3.3.4.1 Raoultella terrigena (Rt)

The general test water in Section 7.3.3.1 shall be used and adjusted to the appropriate pH and contain a target challenge concentration of Rt at ~~5×10^7 cfu/100 mL~~ 1 × 104 to 1 × 105 CFU/100 mL with a maximum geometric average of all influent concentrations not exceeding ~~5×10^8 cfu/100 mL~~ 1 × 105 CFU/100 mL.

7.3.3.4.2 Virus surrogates

The general test water in Section 7.3.3.1 shall be used and adjusted to the appropriate pH and contain a target challenge concentration of:

— Fr coliphage at ~~5×10^6 pfu/100 mL~~ 1 × 104 to 1 × 105 PFU/mL with a maximum geometric average of all influent concentrations not exceeding ~~5×10^7 pfu/100 mL~~ 1 × 105 PFU/mL; and

— MS-2 coliphage at ~~5×10^6 pfu/100 mL~~ 1 × 104 to 1 × 105 PFU/mL with a maximum geometric average of all influent concentrations not exceeding ~~5×10^7 pfu/100 mL~~ 1 × 105 PFU/mL.

***7.3.12.1.1** For the tests conducted in accordance with Sections 7.3.7, 7.3.8, 7.3.9, 7.3.10, and 7.3.11 the influent / effluent sample point pairs' reduction requirement for Rt shall meet all of the reduction requirements defined below:*

The geometric mean of all the bacteria reduction sample point pairs shall be ~~equal to or greater than 6 log reduction (99.9999%)~~ ≥ 3 log reduction (99.9%) with allowance for measurement variability of ~~not more than~~ > 10% of the sample point pairs having ~~less than 6 log~~ < 3 log reduction, defined as:

— for bacteria: one order of magnitude; and

— neither system shall have sequential sample points demonstrating less than 6 3 log reduction; and

— neither system shall have the sample points from the SACET or the third 60-h stagnation sample on Week 4, Day 1 (or Day 2) demonstrating less than 6 3 log reduction.

Example (see Table 8.2) – Bacteria reduction for a 3 wk test conducted in accordance with Section 7.3.7. The test for Rt provides seven sample point pairs for each system for the 3 wk test, plus the third 60-h stagnation sample and the sample from the SACET. If the test lasts 3 wk the total number of sample point pairs per system is:

— (6 from 3 wk test) + (1 stagnation sample) + (1 from SACET) = 8

— number of sample point pairs for the completed test:

— 8 per system × 2 systems = 16 sample pairs.

–maximum number of allowable sample pairs where log reduction is insufficient:

— 10% of 16 = 1.6 (round up to 2 allowable sample point pairs where log reduction is insufficient).

Conclusion: If the geometric mean of all sample point reductions meets or exceeds ~~6 log (99.9999%)~~ 3 log (99.9%), and if there are ≤ 2 sample point pairs demonstrating ~~5 to < 6~~ 2 to < 3 log reduction, the systems shall pass the 3 wk test, as long as none were sequential and none were from the simulated accidental contamination challenge test or from the last 60-h stagnation period.

7.3.12.1.2 *For the virus surrogate reduction test conducted in accordance with Sections 7.3.7, 7.3.8, 7.3.9, 7.3.10, and 7.3.11, the influent / effluent sample point pairs' reduction requirement for both Fr and MS-2 shall meet all of the reduction requirements defined below:*

— the geometric mean of all the virus surrogate reduction sample point pairs shall be ~~equal to or greater than 4 log reduction (99.99%)~~ ≥ 3 log reduction (99.9%) with allowance for measurement variability of not > 10% of the sample point pairs having ~~less than 4 log reduction~~ < 3 log reduction, defined as:

— for virus surrogates: one order of magnitude; and

— neither system shall have sequential sample points demonstrating ~~less than 4 log~~ < 3 log reduction; and

— neither system shall have the sample points from the SACET demonstrating ~~less than 4 log~~ < 3 log reduction.

Example (see Table 8.2) – Virus surrogate reduction for a 3 wk test conducted in accordance with Section 7.3.7. The virus surrogate reduction test provides for three sample points for each virus for the 3 wk test, and one sample point for the SACET for each virus surrogate. Therefore, the total sample point pairs for each virus surrogate is:

— (3 from 3 wk test × 2 virus surrogates) = 6, and (1 from SACET × 2 virus surrogates) = 2;

— 6 + 2 = 8 virus surrogate sample point pairs for each system;

— total number of sample point pairs for the completed 3 wk test:

— 8 per system × 2 systems = 16 sample point pairs.

— maximum number of allowable sample pairs where log reduction is insufficient:

— 10% of 16 = 1.6 (round up to 2 sample pairs where log reduction is insufficient).

Conclusion: If the geometric mean of all sample point reductions meets or exceeds ~~6 log (99.9999%)~~ 3 log (99.9%), and if there are ≤ 2 sample point pairs demonstrating ~~5 to < 6~~ 2 to < 3 log reduction, the systems shall pass the virus surrogate test, as long as none were sequential and none were from the simulated accidental contamination test.

Section 8, Instruction and Information:

8.1 Installation, operation, and maintenance instructions

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"WARNING: This system is for use on water supplies that have been treated to public water system standards or otherwise are determined to be microbiologically safe as demonstrated by routine testing. ~~This system has been tested to demonstrate protection against intermittent accidental microbiological contamination of otherwise safe drinking water~~."

……..

— statement noting:

"For use on private wells: WARNING: Do not use on private well water until the water has been tested by a certified or accredited drinking water laboratory to determine microbial safety (e.g., no total coliform present) in accordance with regulatory standards. ~~Before using this device on a private well, it is the responsibility of the user to have the well tested by a certified drinking water laboratory. For continuous use of this device on a private well,~~ On an ongoing basis, it is the responsibility of the user to obtain frequent microbiological testing (recommended twice per year, minimum) of the well water entering the

system by a certified or accredited drinking water laboratory to monitor continued compliance with the applicable regulatory standards. If the well source
becomes microbiologically contaminated as indicated by testing, discontinue use of this device until sufficient well treatment and testing indicates that the water again meets the applicable regulatory standards. ~~Following exposure of the device to microbiologically contaminated water and prior to its reuse, conduct the p~~Proper sanitization and servicing as directed in the owner's manual should be conducted following a positive test result for the presence of total coliform or the maintenance of the well or plumbing system."

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***8.2.2** Where applicable and appropriate, the following information shall also be included. If the physical size of the system does not permit affixing the following information, the information shall be prominently displayed in the literature accompanying the system and a statement shall be included on the data plate referring the user to the literature:*
— functional description of system (e.g., microbial inactivation);
— maximum operating temperature in °C (°F);
— maximum working pressure in kPa (psig);
— statement of intended use:
"WARNING: This system is for use on water supplies that have been treated to public water system standards or otherwise are determined to be microbiologically safe as demonstrated by routine testing. ~~This system has been tested to demonstrate protection against intermittent accidental microbiological contamination of otherwise safe drinking water~~."

……..

***8.3.2** Where applicable, the following information shall also be stated:*

……..

"WARNING: This system is for use on water supplies that have been treated to public water system standards or otherwise are determined to be microbiologically safe as demonstrated by routine testing. ~~This system has been tested to demonstrate protection against intermittent accidental microbiological contamination of otherwise safe drinking water.~~"

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8.4 Performance data sheet

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"WARNING: This system is for use on water supplies that have been treated to public water system standards or otherwise are determined to be microbiologically safe as demonstrated by routine testing. ~~This system has been tested to demonstrate protection against intermittent accidental microbiological contamination of otherwise safe drinking water.~~"

……..

— statement noting:
"For use on private wells: WARNING: Do not use on private well water until the water has been tested by a certified or accredited drinking water laboratory to determine microbial safety (e.g., no total coliform present) in accordance with regulatory standards. ~~Before using this device on a private well, it is the responsibility of the user to have the well tested by a certified drinking water laboratory. For continuous use of this device on a private well,~~ On an ongoing basis, it is the responsibility of the user to obtain frequent microbiological testing (recommended twice per year, minimum) of the well water entering the system by a certified or accredited drinking water laboratory to monitor continued compliance with the applicable regulatory standards. If the well source

becomes microbiologically contaminated as indicated by testing, discontinue use of this device until sufficient well treatment and testing indicates that the water again meets the applicable regulatory standards. ~~Following exposure of the device to microbiologically contaminated water and prior to its reuse, conduct the p~~Proper sanitization and servicing as directed in the owner's manual should be conducted following a positive test result for the presence of total coliform or the maintenance of the well or plumbing system."

Normative Annex 2, Filtration water treatment systems microbial reduction

N-2.8 Preparation of challenge organisms

N-2.8.1 Fr coliphage

N-2.8.1.1 Stock culture preparation of Fr coliphage

~~Note~~ This section describes the propagation and harvesting methods for stock suspensions of Fr coliphage for use as a challenge suspension for low flow (< 1 GPM) water treatment units. If units possessing a flow rate > 1 GPM are to be tested, the stock preparation procedure may have to be repeated multiple times to achieve the required volume. This method shall also be repeated when cryogenic stocks are low.

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f) ~~For long-term storage (greater than 28 d), add 1/10 volume of sterile glycerol to suspension, dispense into 1-mL and 3-mL aliquots in cryovials, and store at -70 ± 1 °C (-94 ± 1 °F).~~
Working stocks of bacteriophage (large volume stocks used for challenge preparation) shall be stored in the dark at 2 to 8 ˚C (36 to 46 ˚F) for up to 5 y. Propagation freezer stocks (small volume stocks used to produce working stock) of bacteriophage shall be stored in a 1/10 volume of sterile glycerol added to the suspension and dispensed into between 1-mL and 3-mL aliquots in cryovials, and stored at -70 ± 1 °C (-94 ± 2 °F). When those storage conditions are applied, there is no expiration date to follow as long as QC on the propagation stock is performed and acceptable.

N-2.8.2 MS-2 coliphage

N-2.8.2.1 Stock culture preparation of MS-2 coliphage

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f) ~~For long-term storage (greater than 28 d), add 1/10 volume of sterile glycerol to suspension, dispense into 1-mL and 3-mL aliquots in cryovials, and store at -70 ± 1 °C (-94 ± 1 °F).~~
Working stocks of bacteriophage (large volume stocks used for challenge preparation) shall be stored in the dark at 2 to 8 ˚C (36 to 46 ˚F) for up to 5 y. Propagation freezer stocks (small volume stocks used to produce working stock) of bacteriophage shall be stored in a 1/10 volume of sterile glycerol added to the suspension and dispensed into between 1-mL and 3-mL aliquots in cryovials, and stored at -70 ± 1 °C (-94 ± 2 °F). When those storage conditions are applied, there is no expiration date to follow as long as QC on the propagation stock is performed and acceptable.

Table 4.4 was revised.

Table 8.1 was revised.