



**Summary of Substantive Changes  
between the 2019 and the 2020 editions of  
NSF/ANSI 42 “Drinking Water Treatment Units – Aesthetic Effects”**

**Presented to the IAPMO Standards Review Committee on April 12, 2021**

**General:** The changes to this standard may have an impact on currently listed products. The substantive changes are:

- Clarified how systems shall be tested with and without absorptive media for replacement elements under exposure testing (see Section 4.2.3)
- Added guidance on extraction testing for hot and cold water dispensers (see Section 4.2.3.4)
- Added an exemption for cyclic pressure testing for components downstream of the system’s on/off valve that are not subject to pressure under the off mode, and that either contain no media subject to plugging or are not designed to contain media (see Sections 5.4.2, 5.4.4, and Table 5.1 footnote 2)

Section 4, Materials: Updated referenced Standards as follows:

**4.1 Materials in contact with drinking water**

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**4.1.3 Acceptance criteria**

**4.1.3.1** *Materials in contact with drinking water shall not impart levels of target compounds or tentatively identified compounds (TICs) that exceed the total allowable concentration (TAC), maximum contaminant levels (MCL), or maximum acceptable concentration (MAC) criteria specified in ~~NSF/ANSI/CAN 61 Annex D, Table D.1~~ [NSF/ANSI/CAN 600, Table 4.1](#). Any extractable contaminants not listed in the referenced Tables shall be reviewed and shall not exceed criteria developed in accordance with ~~NSF/ANSI/CAN 61, Annex A~~ [NSF/ANSI/CAN 600, Section 3](#).*

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**4.1.3.5** *Whole system or component assembly extraction testing may be waived if components, when separately tested, meet the requirements of this Standard and are assembled in a manner that does not introduce any new components or materials, increase the surface area-to-volume ratio of previously evaluated components, or present potential concern based on cumulative factors. The reported extractable concentrations for components shall be arithmetically added to ensure that the whole system or component assembly meets the allowable levels in accordance with Tables 4.1, 4.2, and, 4.3 ~~and Annexes A, D, and E of~~ [NSF/ANSI/CAN 61](#), ~~and~~ [NSF/ANSI/CAN 600](#).*

Section 4.2.3, Exposure: Clarified how systems shall be tested with and without absorptive media for replacement elements under exposure testing as follows:

**4.2.3.1** *The system or component(s) of a system shall be installed, flushed, and conditioned in accordance with the manufacturer’s instructions using the exposure water specified in Section 4.2.2 at an initial inlet static pressure of 340 kPa (50 psig). [Nonpressurized systems, e.g., pour through products, shall be exposed at atmospheric pressure.](#)*



**4.2.3.1.1** For media powdered activated carbon and polymer binders finer than 100 mesh, testing shall be conducted in flasks with a ratio of 200 g media to 1 L of exposure water specified in Section 4.2.2. For other media additives finer than 100 mesh, testing shall be conducted in flasks at the dose specified by manufacturer's instructions to 1 L of exposure water specified in Section 4.2.2. Testing shall be completed at ambient atmospheric pressure and at a temperature of  $23 \pm 2$  °C ( $73 \pm 3$  °F). Sufficient flasks shall be utilized to collect a minimum of 600 mL of water at each pour off, or the necessary volume for analysis, whichever is greater. The flasks shall be shaken vigorously for 1 min and allowed to settle for 24 h. After 24 h of exposure, the sample water shall be collected and retained. The flask shall be refilled with the same volume of exposure water that was extracted. The flasks will be shaken vigorously for one minute and allowed to settle for 24 h. A second water sample shall be collected and the flasks refilled. The flasks shall be shaken vigorously for 1 min and allowed to settle for 24 h. A third water sample shall be collected. All samples collected shall be composited and analyzed in accordance with Section 4.2.1. One control flask with 2 L of exposure water shall be processed in the same manner as above.

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**4.2.3.4** All samples collected shall be composited and analyzed in accordance with Section 4.2.1. For multiple outlet systems, a composite sample shall be collected from all potable water outlets. The unit volume of the system shall be divided by the total number of potable water outlets and this amount shall be collected from each outlet. Systems that are designed to heat or cool the product water shall be connected to an appropriate power source and operated to heat or cool the water. The system shall be operated at the manufacturer's default temperature setting. If adjustable, the system shall be operated at the highest setting available.

**4.2.3.5** Systems with adsorptive or absorptive media shall be tested with and without the media. Testing without media shall include removal of any granular adsorptive or absorptive media, and removal of any adsorptive or absorptive replacement elements. Systems that contain only encapsulated filter element(s) that are unable to be operated with the element removed, are exempt from without media extraction testing.

**4.2.3.6** Systems with only encapsulated element(s) containing absorptive or adsorptive media but provide a component(s) to allow the consumer to dispense untreated water, without media extraction testing shall be performed on the system in the manner that the system is operated with the bypass component(s) installed. Additional conditioning instructions should be provided in this case if applicable. NOTE — Systems may include an option or design feature which allow the water system to operate even when a filter cartridge is removed such as a bypass valve, dummy cartridge, bypass plug, or other bypass mechanism.

Section 5.4, Structural integrity test methods: Added an exemption for cyclic pressure testing for components downstream of the system's on/off valve that are not subject to pressure under the off mode, and that either contain no media subject to plugging or are not designed to contain media as follows:

#### **5.4.2 Hydrostatic pressure test – Complete systems**

Systems designed to operate only at atmospheric pressure shall be exempt from the hydrostatic pressure test but shall be watertight in normal use. For complete systems designed for open discharge the ~~€~~ components downstream of the system on/off valve that are not subject to pressure under the off mode, and that either contain no media subject to plugging or are not designed to contain media, shall be exempt from the hydrostatic pressure test but shall be watertight in normal use. Components that are downstream of the system on/off valve but upstream of media subject to clogging shall meet the



requirements of this section. The following procedure shall be used for the hydrostatic pressure testing of other complete systems:

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**5.4.4 Cycle test**

Systems designed to operate at atmospheric pressure shall be exempt from the cyclic pressure test but shall be watertight in normal use. For complete systems designed for open discharge the components downstream of the system on/off valve that are not subject to pressure under the off mode, and that either contain no media subject to plugging or are not designed to contain media, shall be exempt from the cyclic pressure test but shall be watertight in normal use. Components that are downstream of the system on/off valve but upstream of media subject to clogging shall meet the requirements of this section.

The following procedure shall be used for the cyclic testing:

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Section 7.3, Chemical reduction testing: Corrected the improper use of requirements (i.e., “shall”) in notes and informative annexes, updated normative references, and corrected minor typos as follows:

**7.3.6.6 Influent challenge**

**7.3.6.6.1 pH adjustment test water**

A water supply with the following specific characteristics shall be used:

Temperature	20 ± 3 °C (68 ± 5 °F)
TDS	200 to 500 mg/L
TOC	≥ 1.0 mg/L
turbidity	< 1 NTU

NOTE — If precipitation of heavy metals occurs, deionized water ~~shall~~ should be substituted for the public water supply, and magnesium or calcium salts ~~shall~~ should be added to provide the desired TDS. In this case, it is permissible to waive the TOC requirements ~~shall be waived~~ and ~~the pH requirement shall be modified~~ modify the pH requirement accordingly.

**7.3.7.6 Influent challenge**

**7.3.7.6.1 Zinc reduction test water**

A water supply with the following specific characteristics shall be used:

pH	7.5 ± 0.5
Temperature	20 ± 3 °C (68 ± 5 °F)
TDS	200 to 500 mg/L
TOC	≥ 1.0 mg/L
alkalinity (as CaCO <sub>3</sub> )	20 to 40 mg/L
turbidity	< 1 NTU

NOTE — If precipitation of heavy metals occurs, deionized water ~~shall~~ should be substituted for the public water supply, and magnesium or calcium salts ~~shall~~ should be added to provide the desired TDS. In this case, it is permissible to waive the TOC requirements ~~shall be waived~~ and ~~the pH requirement shall be modified~~ modify the pH requirement accordingly.



## 8 Instruction and information

### **8.4 Performance data sheet**

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**8.4.3** For commercial systems, in addition to the requirements set forth in Section 8.4.1, additional considerations are as follows:

- a performance data sheet may be developed for each modular element of the system, ~~and/or~~ for a group of modular elements; and
- the performance data sheet shall include all of the configurations, providing the following information for each:

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Table 5.1, Structural Integrity testing requirements: Footnote 2 was revised as follows:

~~<sup>2</sup> Components downstream of the system on/off valve that are not subject to pressure under the off mode, and that either contain no media subject to plugging or are not designed to contain media shall be exempt from the hydrostatic pressure test, but shall be watertight in normal use. Components that are downstream of the system on/off valve but upstream of media subject to clogging shall meet the requirements of this section. See Sections 5.4.2 and 5.4.4 for qualified exemptions.~~

Table 7.2, Chloramine reduction requirements claims: The header in Table 7.2 was revised to reflect requirement provided in the table.

Figure 2, Example test apparatus: The notes for Figure 2 were revised as follows:

NOTE 1 — Faucet-attached systems and portable systems ~~shall be~~ are placed after control valves.

NOTE 2 — Solenoid valves ~~shall be~~ are controlled by appropriate timer(s).

NOTE 3 — Mechanical filter ~~shall be~~ is a particulate reduction, Class I, without any adsorptive or absorptive media.