



**Summary of Substantive Changes
between the 2020 and 2021 editions of
NSF/ANSI/CAN 61 “Drinking Water System Components - Health Effects”**

Presented to the IAPMO Standards Review Committee on December 13, 2021

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

- Added the pH 5 extraction water test to brass/bronze surfaces (currently Table N-1.3b), and added the requirement of a use limitation statement on product literature and certification listings for those products that fail for copper at pH 5 (see Sections 4.5.3.2, 4.5.3.3, 4.5.3.4, 8.4.1, N-1.2.5, and Table 1.3b)
- Removed non-chlorinated pH 8 extraction water for organics analysis (see Section N-1.9.1, removed N-1.9.6, and Revised Table N-1.15)

3.3 Identification of analytes

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3.3.2 Established minimum test batteries

The materials listed in Table 3.1 or Table 3.2 shall be tested for the indicated analyses and any formulation-dependent analyses identified during the formulation-dependent analyte selection. Products, components, or materials made exclusively from materials in Table 3.1 shall not require testing if:

- *their DSA-to-volume ratio in the application is $\leq 0.001 \text{ in}^2/\text{L}$ or $0.0001 \text{ in}^2/\text{L}$ for static or flowing conditions respectively, or*
- *the material is uncoated concrete for use in a water storage structure of $1.33 \times 106 \text{ L}$ ($0.35 \times 106 \text{ gal}$) or greater and any admixtures used have been evaluated to this Standard and found compliant within the use levels in the concrete, or*
- *the material is uncoated concrete or for use in applications with a DSA-to-volume ratio less than or equal to $0.8 \text{ in}^2/\text{L}$ or $0.08 \text{ in}^2/\text{L}$ for static or flowing conditions respectively, and any admixtures used have been evaluated to this Standard and found compliant within the use levels in the concrete; or*

Section 4.5, Extraction procedures: Revised the product literature statement for products containing Copper as follows:

4.5 Extraction procedures

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4.5.3.2 Copper (C12200) pipe, tubing and fittings

Copper (C12200) pipe, tubing and fittings evaluated under Section 4 of this Standard shall not require analysis for regulated metals release under the pH 5 test condition provided the following use limitation statement is included in the manufacturer’s use instructions or product literature that references this Standard:

~~*“Copper [tube, pipe, or fitting] (Alloy [alloy designation]) has been evaluated by [Testing Organization] to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.”*~~



“Use of this material may not be appropriate in all water chemistries. Copper [tube, pipe, or fitting] may require corrosion control to limit the leaching of copper into drinking water under certain water chemistries. Refer to Informative Annex I-6.1 of NSF/ANSI/CAN 61 for the water quality considerations to be used before installing this product.”

4.5.3.3 Copper and copper alloys other than C12200

Copper and copper alloy pipe and tubing comprised of alloys other than C12200 shall be exposed in either the pH 5 (Section N-1.9.3) or the pH 6.5 (Section N-1.9.4) exposure waters (at the discretion of the manufacturer) and in the pH 8 (Section N-1.9.87) exposure waters as described in Section N-1.9. Copper and copper alloy fittings comprised of alloys other than C12200 intended to be used with copper and copper alloy pipe and tubing shall be exposed in either the pH 5 (Section N-1.9.3) or the pH 6.5 (Section N-1.9.4) exposure waters (at the discretion of the manufacturer) and in the pH 8 (Section N-1.9.87) exposure water, as described in Section N-1.9. For all copper and copper alloy pipes, tubing, and fittings tested using the pH 6.5 exposure water, the manufacturer’s literature shall indicate this use limitation by inclusion of the following statement in the use instructions or product literature that references this Standard:

~~*“Copper [tube, pipe, or fitting] (Alloy [alloy designation]) has been evaluated by [Testing Organization] to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.”*~~

“Use of this material may not be appropriate in all water chemistries. Copper [tube, pipe, or fitting] may require corrosion control to limit the leaching of copper into drinking water under certain water chemistries. Refer to Informative Annex I-6.1 of NSF/ANSI/CAN 61 for the water quality considerations to be used before installing this product.”

4.5.3.4 Brass and bronze materials

Brass and bronze materials shall be exposed in the pH 5 (Section N-1.9.3) and in the pH 8 (Section N-1.9.8) exposure waters as described in N-1.9. Normalized copper concentrations observed using the pH 5 test waters that exceed the TAC for the static condition or the SPAC for the flowing conditions at pH 5 may be waived when the product contains brass or bronze materials and when the manufacturer’s literature includes the use limitations for these materials with certain water characteristics by inclusion of the following statement in the use instructions or product literature that references this Standard:

~~*“Copper [tube, pipe, or fitting] (Alloy [alloy designation]) has been evaluated by [Testing Organization] to NSF/ANSI/CAN 61 for use in drinking water supplies of pH 6.5 and above. Drinking water supplies that are less than pH 6.5 may require corrosion control to limit leaching of copper into the drinking water.”*~~

“Use of this material may not be appropriate in all water chemistries. Products containing brass/bronze materials may require corrosion control to limit the leaching of copper into drinking water under certain water chemistries. Refer to Informative Annex I-6.1 of NSF/ANSI/CAN 61 for the water quality considerations to be used before installing this product.”

7.5.4.2 Nonadsorptive media used in POE devices

Media used in POE devices shall be exposed, based on a formulation review and determination of the most severe condition(s), to one or more appropriate extraction waters as detailed in Section N-1.9 and Table N-1.3 *for all other wetted materials.*



8.4.1 Brass or bronze containing in-line devices

The evaluation of brass or bronze containing in-line devices for contaminants other than lead shall require exposure of at least one sample in accordance with Section 8.4.

The evaluation of brass or bronze containing in-line devices for lead under the pH 8 conditions shall be exposed in at least triplicate (more if specified by the manufacturer) if the test representative holds ≤ 2 L and has a dry weight ≤ 15 kg (33 lb). If specified by the manufacturer, the test representative that holds more than 2 L, or has a dry weight in excess of 15 kg (33 lb) may also be exposed in a quantity greater than 1.

~~—when the exposure water selection is per Table N-1.3a, the pH 10 condition shall be exposed in triplicate; or~~

~~—when the exposure water selection is per Table N-1.3b, the pH 8 condition shall be exposed in triplicate.~~

8.7 Other mechanical devices, components, and materials

Samples for the testing of all other mechanical devices, components, and materials shall be selected according to the requirements of Sections N-1.2.3 and N-1.4.1. Extraction waters shall be selected according to Section N-1.2.5. Other mechanical product samples shall be conditioned as indicated in Section N-1.4.3. Following conditioning, the samples shall be exposed as indicated in Section ~~N-1.4.4.2~~ [N-1.4.4.4](#) and Table N-1.9. Normalization shall be as specified in Sections N-1.8.3, N-1.8.4, and N-1.8.6, as applicable.

Section N-1.2 General evaluation requirements

N-1.2.5 Extraction waters

Samples shall be exposed, based on a formulation review and determination of the most severe condition(s), to the required extraction waters as detailed in Table N-1.3, except for mechanical plumbing devices (see Section N-1.5.5). ~~At the discretion of the manufacturer, the extraction waters detailed in Table N-1.3b shall be used as an alternate to those in Table N-1.3a.~~ The characteristics and preparation of the waters are described in Section N-1.9.

The test water formulations as provided in Section N-1.9 shall be used without the addition of free available chlorine when testing high flow devices (or their components) exclusively used at public water treatment facilities and typically installed prior to chlorination.

NOTE — Some materials used in these devices may be damaged by chlorine and test waters that include chlorine would not be representative of field use conditions for this use type.

Section N-1.9, Extraction water preparation

N-1.9.1 Chemical characteristics

Five extraction waters shall be available for exposure:

- 1) pH = 5 ± 0.3 , with 2 ± 0.5 mg/L free available chlorine and 100 mg/L hardness
- 2) pH = 6.5 ± 0.3 , with 2 ± 0.5 mg/L free available chlorine and 100 mg/L hardness
- ~~3) pH = 8 ± 0.3 (organic analysis), with no chlorine added and 100 mg/L hardness~~
- ~~4) pH = 10 ± 0.3 , with 2 ± 0.5 mg/L free available chlorine~~
- ~~5) pH = 8 ± 0.3 , alkalinity of 500 ± 25 mg/L, dissolved inorganic carbon of 122 ± 5 mg/L, and 2 ± 0.5 mg/L of free chlorine.~~

All exposure water that is used to determine compliance to this Standard shall be used within 24 hours of preparation and stored in a closed container.



~~N-1.9.6 pH 8 water (organic analysis)~~

~~pH 8 organic extraction water shall be prepared to contain no chlorine added. Stock reagent solutions in the amounts shown in Table N-1.15 shall be diluted to the desired water volume with reagent water. The pH shall be adjusted to pH 8 ± 0.3 using 0.1M HCl or 0.1M NaOH as needed.~~

~~N-1.9.7~~ ~~N-1.9.6~~ pH 10 water

~~pH 10 extraction water shall be prepared to contain 2 ± 0.5 mg/L free available chlorine. Stock reagent solutions in the amounts shown in Table N-1.15 shall be diluted to the desired water volume with reagent water. The pH shall be adjusted to pH 10 ± 0.3 using 0.1M HCl or 0.1M NaOH as needed.~~

~~N-1.9.8~~ ~~N-1.9.7~~ pH 8 water (from Section 9)

~~The extraction water shall be prepared by combining:~~

- ~~— 25 mL of 0.4 M sodium bicarbonate;~~
- ~~— chlorine stock solution per Section N-1.9.2.4; and~~
- ~~— reagent water meeting the requirements of Section N-1.9.2.1 (make up to 1 L), and adjust pH as needed using 0.1 M HCl.~~

Table 4.2 was revised

Table N-1.3a was deleted.

Table N-1.3b was revised and renumbered to N-1.3. Footnote was added as follows:

[⁴ Compliance with copper criteria is not required under the pH 5 test waters as long as the requirements in Section 4.5.3.4 are also met.](#)

Table N-1.7 was revised

Table N-1.8 was revised

Table N-1.9 was revised

Table N-1.15 was revised to remove non-chlorinated pH 8 extraction water for organics analysis.