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Joint Committee on Drinking Water Additives – System Components

July 31, 2024

Proposed revision to NSF/ANSI/CAN 61 – Drinking Water System Components – Health Effects (61i189r1)

Revision 1 of NSF/ANSI/CAN 61, issue 189 is being forwarded to the Joint Committee for consideration. Please review the proposal and **submit your ballot by August 21, 2024** via the NSF Online Workspace.

Please review all ballot materials. When adding comments, please include the section number applicable to your comment and add all comments under one comment number whenever possible. If you need additional space, please use the attached blank comment template in the reference documents and upload online via the browse function.

Purpose

The proposed revision will add language to the footnote of Table 3.1 in order to clarify the chromium pass/fail criteria.

Background

An issue paper was submitted to clarify the footnote concerning chromium pass/fail criteria in Table 3.1: Material-specific analyses. The current language may be misinterpreted to mean that if total chromium passes the product complies. It is recommended that the footnote state that the total chromium value shall be evaluated against the pass/fail criteria chromium VI [Cr(VI)] as a screening level. If the normalized result exceeds this criterion, the sample shall be tested according to the method described in Section N-1.7.3 and shall be evaluated against the pass/fail criteria listed in NSF/ANSI/CAN 600 Table 4.1.

If you have any questions about the technical content of the ballot, you may contact me in care of:

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[Note – the recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by grey highlighting. Rationale Statements are in *italics* and only used to add clarity; these statements will NOT be in the finished publication.]

NSF/ANSI/CAN Standard
for Drinking Water Additives –

Drinking Water System Components – Health Effects

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3 General Requirements

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Table 3.1
Material-specific analyses

Material type	Required analyses
pipe / fitting / device materials	
aluminum	regulated metals, [a] aluminum
aluminum oxide ceramics	regulated metals, [a] aluminum
asphaltic-coated ductile iron	GC/MS, [b] VOCs, regulated metals, [a] polynuclear aromatic hydrocarbons (PNAs), molybdenum, vanadium, manganese
brass	regulated metals, [a] zinc, nickel, bismuth [c]
carbon graphite nonimpregnated	GC/MS, [b] VOCs, polynuclear hydrocarbons (PNAs), regulated metals [a]
carbon graphite (phenol formaldehyde impregnated)	GC/MS, [b] VOCs, polynuclear hydrocarbons (PNAs), formaldehyde, regulated metals [a]
carbon steel	regulated metals [a]
cast iron	regulated metals [a]
chrome / nickel plating	regulated metals, [a] nickel
concrete [d]	regulated metals, [a] cesium
concrete aggregate [d]	regulated metals, [a] radionuclides
copper	regulated metals [a]
ductile iron	regulated metals [a]
galvanized steel	regulated metals, [a] zinc, nickel

Table 3.1
Material-specific analyses

Material type	Required analyses
magnets	regulated metals, [a] metals [c,e]
nickel based alloys	regulated metals, [a] nickel
platinum	regulated metals, [a] platinum
quartz	regulated metals [a]
ruby or sapphire (natural and synthetic aluminum oxide gemstones)	regulated metals, [a] aluminum
silicon carbide ceramics	regulated metals, [a] silicon
silver	regulated metals, [a] silver
stainless steel	regulated metals, [a] nickel
titanium	regulated metals, [a] titanium
tungsten carbide	regulated metals, [a] tungsten
zirconium oxide ceramics	regulated metals, [a] zirconium
Plastic materials	
acetal (AC) / polyoxymethylene (POM)	GC/MS, [b] VOCs, regulated metals, [a,c] formaldehyde
acrylonitrile-butadiene-styrene (ABS), acrylonitrile-styrene (SAN)	GC/MS, [b] VOCs, regulated metals, [a,c] acrylonitrile, 1,3-butadiene, styrene
cross-linked polyethylene (PEX)	GC/MS, [b] VOCs, regulated metals, [a,c] methanol, *tert*-butyl alcohol [f]
nylon 6	GC/MS, [b] VOCs, regulated metals, [a,c] caprolactam
other nylons	GC/MS, [b] VOCs, regulated metals, [a,c] nylon monomers
polybutylene (PB)	GC/MS, [b] VOCs, regulated metals [a,c]
polycarbonate (PC)	GC/MS, [b] bisphenol A, VOCs, regulated metals [a,c]
polyethylene (PE)	GC/MS, [b] VOCs, regulated metals [a,c]
polyphenylene oxide (PPO)	GC/MS, [b] dimethyl phenol, VOCs, regulated metals [a,c]
polyphthalamide (PPA)	GC/MS, [b] VOCs, regulated metals, [a,c] hexamethylene diamine, terephthalic acid, isophthalic acid
polypropylene (PP)	GC/MS, [b] VOCs, regulated metals [a,c]
polystyrene	styrene, GC/MS, [b] VOCs, regulated metals, [a] phenolics (by GC/MS base/acid scan) [b]
polysulphone including poly[phenylene sulphone] (PPSU)	GC/MS, [b] VOCs, regulated metals, [a,c] sulphone monomer
polyurethane (PUR)	GC/MS, [b] VOCs, regulated metals [a,c]
polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC)	regulated metals, [a,c] phenolics, [b] VOCs, tin, [g] lead, antimony, [h] residual vinyl chloride monomer (RVCM) [i]

Table 3.1
Material-specific analyses

Material type	Required analyses
PVC (flexible)	GC/MS, [b] VOCs, regulated metals, [a,c] lead, phthalates, [j] RVCM, [i] tin, [g] zinc [k]
Joining and sealing materials	
chloroprene	GC/MS, [b] VOCs, and 2-chloro-1,3-butadiene, phthalates, [j] PNAs, [b] nitrosoamines [l]
ethylene-propylene-diene monomer (EPDM)	GC/MS, [b] VOCs, phthalates, [j] PNAs, [b] nitrosoamines [l]
ethylene tetrafluoroethylene (ETFE)	GC/MS, [b] VOCs, perfluorooctanoic acid
flux	GC/MS, [b,c] VOCs, regulated metals, [a,c] PNAs [b,c]
fluoroelastomer	GC/MS, [b] VOCs, perfluorooctanoic acid
isoprene	GC/MS, [b] VOCs, phthalates, [j] PNAs, [b] isoprene monomer, nitrosoamines [l]
nitrile-butadiene rubber (NBR, BUNA-N, HNBR)	GC/MS, [b] VOCs, phthalates, [j] PNAs, [b] 1,3-butadiene, acrylonitrile, nitrosoamines [l]
PTFE (polytetrafluoroethylene)	GC/MS, [b] VOCs, perfluorooctanoic acid
PVDF (polyvinylidene fluoride)	GC/MS, [b] VOCs, vinylidene fluoride, hexafluoropropene
silicone	GC/MS, [b] VOCs, 2,4-dichlorobenzoic acid
solder	regulated metals, [a] aluminum, bismuth, nickel, silver, strontium, zinc
solvent cements	GC/MS, [b] VOCs, [c] acetone, tetrahydrofuran, cyclohexanone, methyl ethyl ketone, dimethylformamide, methyl isobutyl ketone
styrene-butadiene rubber (SBR)	GC/MS, [b] VOCs, phthalates, [j] PNAs, [b] 1,3-butadiene, styrene, nitrosoamines [l]
Barrier materials	
asphaltic coatings	GC/MS, [b] VOCs, regulated metals, [a] molybdenum, vanadium, manganese, PNAs [b]
epoxy coatings (liquid and powder)	GC/MS, [b] VOCs, bisphenol A, [c] bisphenol A-diglycidyl ether, [m] bisphenol A-diglycideryl ether, [m] bisphenol A-propoxylate, [c,m] epichlorohydrin, [c] bisphenol F, [c] bisphenol F-diglycidyl ether, [c,m] bisphenol F-diglycideryl ether, [c,m] bisphenol F-propoxylate, [c,m] solvent and reactive diluent additives [c,n]
polyester coatings	GC/MS, [b] VOCs, residual monomers [o]
polyurethane coatings	GC/MS, [b] VOCs
portland and hydraulic cements [d]	GC/MS, [b] regulated metals, [a] dioxins and furans, radionuclides, glycols and ethanolamines, [p] cesium

[a] Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, thallium. The total Chromium value shall be evaluated against the pass/fail criteria of chromium VI as a screening detection ~~level~~. If the normalized result exceeds this criteria, the sample shall be tested according to the method described in Section N-1.7.3 and shall be evaluated against the pass/fail criteria listed in Table 4.1 of NSF/ANSI/CAN 600 ~~for the tested product~~. Regardless of the chromium species, the total chromium pass/fail criteria shall not be exceeded and the chromium VI level shall not exceed the value in table 4.1 of NSF/ANSI/CAN 600.

Table 3.1
Material-specific analyses

Material type	Required analyses

[b] See Section N-1.7.

[c] The testing may be waived for a this specific analyte where formulation information indicates that it is not present. In instances where the complete formulation has not been obtained for the material as allowed through Note 1 of Section 3.2, testing shall include this analyte.

[d] Concrete aggregate sampling is required only if the method for testing for individual concrete components is used. Aggregate sampling is not required if concrete cylinders are tested for the constituents in portland and hydraulic cements.

[e] Aluminum, antimony, arsenic, barium, beryllium, bismuth, cadmium, cerium, cobalt, chromium, cesium, copper, dysprosium, erbium, europium, gallium, gadolinium, germanium, hafnium, indium, lanthanum, lead, lithium, lutetium, manganese, mercury, molybdenum, niobium, neodymium, nickel, palladium, praseodymium, platinum, rubidium, rhenium, rhodium, ruthenium, samarium, selenium, silver, strontium, tantalum, tellurium, thallium, tin, titanium, tungsten, uranium, vanadium, tungsten, ytterbium, zinc, zirconium. The total Chromium value shall be evaluated against the pass/fail criteria of chromium VI as a screening level. If the normalized result exceeds this criteria, the sample shall be tested according to the method described in Section N-1.7.3 and shall be evaluated against the pass/fail criteria listed in Table 4.1 of NSF/ANSI/CAN 600 ~~for the tested product~~. Regardless of the chromium species, the total chromium pass/fail criteria shall not be exceeded and the chromium VI level shall not exceed the value in table 4.1 of NSF/ANSI/CAN 600.

[f] *Tert*-Butyl alcohol analysis is required for PEX materials except those crosslinked via e-beam methodology.

[g] The analysis for tin is required when tin-based stabilizers are used.

[h] The analysis for antimony is required when antimony-based stabilizers are used.

[i] The level of RVCM within the walls of PVC or CPVC products and materials shall be directly determined (Section N-1.7).

[j] The analysis for phthalates is required when phthalate ester plasticizers are used. Analysis shall be for the specific phthalate ester(s) used in the formulation.

[k] The analysis for zinc is required when zinc-based stablilizers are used.

[l] Analysis for n-nitrosodimethylamine, n-nitrosomethylethylamine, n-nitrosodiethylamine, n-nitrosodi-n-propylamine, n-nitrosopyrrolidine, n-nitrosomorpholine, n-nitrosopiperidine, n-nitrosodi-n-butylamine and n-nitrosodiphenylamine are required when material is sulfur cured.

[m] Analysis shall be performed using liquid chromatography with ultraviolet detection (LC/UV).

[n] Analysis shall be performed for the specific solvent and reactive diluent additives used in the individual product formulation, such as benzyl alcohol.

[o] Analysis shall be performed for residual concentrations of the specific ester monomers used in the individual product formulation.

[p] Glycol and ethanolamine analyses shall be performed on cements containing these compounds as grinding aids.

Rationale: Adds language to eliminate confusion concerning the chromium pass/fail criteria.