



**Summary of Substantive Changes  
between the 2016 and the 2017 editions of  
NSF/ANSI 50, “Equipment and Chemicals for Swimming Pools, Spas, Hot Tubs,  
and other Recreational Water Facilities”**

**Presented to the IAPMO Standards Review Committee on May 7, 2018**

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

- Normative references were updated.
- Language regarding shelf life testing for manufacturers of water quality testing devices was revised.
- This issue updated the WQTD testing sections of the Standard.
- Flow meter language was revised to reflect consideration of the devices being used in applications where specific gravity is greater than 1.0.
- The title and scope were updated to include chemicals.
- Specific criteria for metal contaminant limits were added.
- Language adding clarity to effective size and uniformity coefficient calculations was incorporated. (See Sections 2.33 and 12.2.3)
- Language regarding chemical feeders was revised.
- This issue revised language regarding formulation testing in Annex A.
- Exposure assumptions were updated in Annex R.

Title: The term chemical was added to the title as follows:

*Equipment [and Chemicals](#) for Swimming Pools, Spas, Hot Tubs, and other Recreational Water Facilities*

Section 1.1, Scope: The scope was revised to include the term chemicals as follows:

**1.1 Scope**

*This Standard covers materials, [chemicals](#), components, products, equipment and systems, related to public and residential recreational water facility operation.*

Section 2, Normative references: Referenced standards were added, removed or updated as follows:

**2 Normative references**

*ASME, Boiler and Pressure Vessel Code. 2017<sup>5</sup>*

*ANSI/ASME A112.6.3 – ~~2001~~ [2016](#) (R2007). Floor and Trench Drains<sup>5</sup>*

*ANSI/ASME A112.6.4 – 2003 (~~R2008~~ [2012](#)). Roof, Deck and Balcony Drains<sup>5</sup>*

*ANSI/IAPMO Z124.7- ~~1997~~ [2013](#) Prefabricated Plastic Spa Shells<sup>7</sup>*

*ANSI/UL 1081 ~~2011~~ [2016](#), 7th. Swimming Pools, Pumps, Filters and Chlorinators<sup>8</sup>*

*ANSI/UL 1261 ~~2011~~ [2016](#), 6th. Electric Water Heaters for Pools and Tubs<sup>8</sup>*

*APHA, Standard Methods for the Examination of Water and Wastewater, ~~twentieth~~ [23rd](#) edition<sup>9</sup>*

*ASTM C136/~~C136M~~-~~2006~~ [2014](#): Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates, 2004<sup>10</sup>*



ASTM D1894 – ~~11<sup>ed</sup>~~ (2014). *Standard Test Method for Static and Kinetic Coefficients of Plastic Film and Sheeting*<sup>10</sup>

ASTM D2464 – (2006 2013). *Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80*<sup>10</sup>

ASTM D2466 – (2006 2015). *Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40*<sup>10</sup>

ASTM F2049-~~1011~~ (2017) *Standard Guide for Fences/Barriers for Public, Commercial and Multi-Family Residential Use Outdoor Play Areas*<sup>10</sup>

ASTM F2208-~~2008~~ 2014. *Standard Safety Specification for Residential Pool Alarms*<sup>10</sup>

ASTM F2409-10 (2016). *Standard Guide for Fences for Non-Residential Outdoor Swimming Pools, Hot Tubs, and Spas*<sup>10</sup>

ASTM F2699-08 (2013) *Standard Guide for Fences for Commercial and Public Outdoor Water Spray/Play Areas*<sup>10</sup>

ASTM G154-~~06~~ 16: *Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials*<sup>10</sup>

CEC-400-~~2009~~ 2016-002 Title 20. California Energy Commission 2009 Appliance Efficiency Regulations<sup>11</sup>

[CSA B45.5/IAPMO Z124.1.2 – 2005 2011. Plastic Bathtub and Shower Units](#)<sup>7</sup>

NFPA 70, Article 30. ~~2005~~ 2017. *National Electrical Code (NEC)*<sup>13</sup>

2, Definitions: The following definitions have been added as follows:

**2.33 effective size:** *The size opening that will just pass 10% (by dry weight) of a representative sample of the filter material*

**2.131 supplemental disinfection:** *Units that demonstrate a 3-log (99.9%) or greater reduction of *Pseudomonas aeruginosa* and *Enterococcus faecium* when tested according to Annex H, Section H.1.*

**2.147 uniformity coefficient:** *A ratio calculated as the size opening that will just pass 60%(by dry weight) of a representative sample of the filter material divided by the size opening that will just pass 10% (by dry weight) of the same sample.*

**2.153 WQTD accuracy:** *Accuracy is defined as how close the WQTD result is to the reference value.*

**2.154 WQTD precision:** *Precision is defined as how close replicates of a single value are to each other.*

**12.2.3.1** The manufacturer of sand and an alternate sand-type filter media shall specify the effective size and uniformity coefficient for the media. Effective size and uniformity coefficient evaluation shall be performed in accordance with ASTM C136 with sieves conforming to ASTM E11. A minimum of five data points shall be measured for sizing. The particle size data shall be plotted as a smooth curve, which shall be used to read the sieve opening sizes at which 60% and 10% of particles can pass. The uniformity coefficient and effective size measured shall be  $\pm 10\%$  of the claimed uniformity coefficient and effective size, or shall be within the claimed range of uniformity coefficient and effective size, whichever is larger.

## **13, Ozone generation process equipment:**

### **13.1 General**



Ozone generation process equipment covered by this section is intended for the secondary and supplemental disinfection of the water in the circulation system of public and residential recreational water facilities, including but are not limited to: pools, and spas/hot tubs, therapy pools, and interactive aquatic play features. Since these products are not intended to produce residual levels of disinfectant within the body of water, an EPA registered disinfecting chemical shall be added to impart a measurable residual. The measurable residual disinfecting chemical shall be easily and accurately measured by a water quality device certified to Section 19.

### **13.19 Disinfection efficacy**

Process equipment designed for ~~secondary~~ supplemental disinfection such as copper and/or silver ion generators, ozone and ultraviolet light equipment shall demonstrate a 3-log (99.9%) or greater inactivation of influent bacteria when tested according to Annex H, Section H.1.

~~Ozone systems claiming~~ Process equipment designed for secondary disinfection such as copper and/or silver ion generators, ozone and ultraviolet light equipment shall demonstrate a 3-log (99.9%) or greater reduction of *Cryptosporidium parvum* ~~shall be~~ when tested and evaluated according to Section 13.20.

### **13.23 Data plate**

Data plate(s) shall be permanent; easy to read; and securely attached, cast, or stamped onto the unit at a

location readily accessible after normal installation. Data plate(s) shall contain the following:

- manufacturer's name and contact information (address, phone number, website, or prime supplier);
- model number;
- serial number or date of manufacture;
- certification mark of the ANSI-Accredited testing and certification organization;
- electrical requirements (volts, amps, hertz) for operation;
- type of feed-gas;
- rated feed-gas flow rate (SCFH and/or LPM);
- rated ozone production (grams/hour and/or pounds/day);
- method of cooling and coolant flow rates;
- level of disinfection certification (Level 1 or Level 2);
- maximum daily operation time (if not designed for continuous operation);
- caution statements (prominently displayed) including a statement that the unit ~~is designed for secondary disinfection and~~ should be used with an EPA registered disinfection chemical to impart a measurable residual concentration in the water; and
- a statement identifying if the unit is suitable for supplemental disinfection or for secondary disinfection.

## **14 Ultraviolet (UV) light process equipment**

### **14.1 General**

UV light process equipment covered by this section is intended ~~for use in~~ the secondary and supplemental treatment ~~of circulation systems~~ of public and residential swimming pools and spas/hot tubs. Since these products are not intended to produce residual levels of disinfectant within the body of the swimming pool or spa, these products are intended for use with appropriate residual levels of EPA registered disinfecting chemicals.



Specific residual levels of EPA registered disinfecting chemicals may be required by the regulatory agency having authority. The residual chemical shall be easily and accurately measurable by a field test kit.

#### **14.7 Data plate**

Data plate shall be permanent; easy to read; and securely attached, cast, or stamped onto the unit at a location readily accessible after normal installation. Data plate(s) shall contain the following:

- equipment name and function(s);
- manufacturer's name and contact information (address, phone number, website, or prime supplier);
- model number designation;
- electrical requirements for operational volts, amps, and Hertz of the unit;
- serial number or year of construction;
- maximum rated operating pressure in kPa (psi);
- prominently displayed caution statement: "UV light is harmful to eyes and exposed skin; turn off electrical supply before opening unit.";
- caution statement that the unit ~~is designed for supplementary disinfection and~~ should be used with registered or approved disinfection chemicals to impart required residual concentrations;
- model and number of UV lamp(s);
- maximum daily operation time (if not designed for continuous operation);
- maximum design flow rate in gallons/minute (liters/minute); and
- a statement identifying if the unit is suitable for supplemental disinfection or for secondary disinfection.

#### **14.8 Disinfection efficacy**

Process equipment designed for supplemental disinfection such as copper and/or silver ion generators, ozone and ultraviolet light equipment shall demonstrate a 3-log (99.9%) or greater inactivation of influent bacteria when tested according to Annex H, Section H.1.

Process equipment designed for secondary disinfection such as ozone and ultraviolet light equipment shall demonstrate a 3-log reduction of influent bacteria when tested according to Annex H. Equipment that has been successfully evaluated to the requirements of this section to demonstrate 3-log (99.9%) or greater inactivation of *Cryptosporidium parvum* are exempt for the requirement of Annex H. when tested and evaluated according to Section 14.18.

~~UV systems claiming chlorine resistant organism treatment such as *Cryptosporidium parvum* inactivation shall be evaluated according to 14.18.~~

#### **H.1 Disinfection efficacy of ~~secondary~~ supplemental disinfection equipment**

##### **H.1.1 Purpose**

The purpose of this test is to determine the disinfection efficacy of process equipment designed for ~~secondary~~ supplemental disinfection for swimming pools and hot tub / spas.