NSF/ANSI 50

Equipment for Swimming Pools, Spas, Hot Tubs and other Recreational Water Facilities

Evaluation criteria for materials, components, products, equipment and systems for use at recreational water facilities

1.5 Normative references

The following documents contain provisions that, through reference in this text, constitute provisions of this Standard. At the time of publication, the indicated editions were valid. All standards are subject to revision, and parties are encouraged to investigate the possibility of applying the recent editions of the standards indicated below.

- NSPI-6 American National Standard for Residential Portable Spas
- ANSI/IAPMO Z124.7 1997 Prefabricated Plastic Spa Shells
- ANSI/IAMPO Z124.1.2 2005 Plastic Bathtub and Shower Units
- ANSI/UL 1081 2011 Swimming Pools Pumps Filters and Chlorinators
- ANSI/UL 1261 2001 Electric Water Heaters for Pools and Tubs
- ANSI/UL 1563 2009 Standard for Electric Hot Tub, Spas and Associated Equipment
- ANSI/UL 2017 2011 General-Purpose Signaling Devices and Systems

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1 ASME – 3 Park Avenue, New York, NY 10016-5990 www.asme.org
2 APSP – The Association of Pool and Spa Professionals, 2111 Eisenhower Avenue • Alexandria, VA 22314 www.apsp.org
3 NSPI – National Spa and Pool Institute, PO Box 874 Randburg, Randburg, Gauteng, South Africa 2125 www.NSPI.co.za
4 ANSI – American National Standard Institute, 1819 L Street, NW, 6th floor Washington, DC 20036 www.ansi.org
5 UL – Underwriters laboratory, 2600 N.W. Lake Rd. Camas, WA 98607-8542 www.ul.com

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ASTM D1894 11e1 *Stand Test Method for Static and Kinetic Coefficients of Plastic Film and Sheeting*[^6]


IAPMO SPS 4 *Special Use Suction Fittings*[^7]

2. Definitions

- **2.xx comply (complies, compliance):** Meeting the requirements of the Standard, which includes Standards incorporated by reference in the text.

- **2.xx integral:** Part of the device (i.e., spa or hot tub) that cannot be removed without compromising the device function or destroying the physical integrity of the unit.

- **2.xx indoor use:** A product that is not designed, tested or certified for use outside or to exposed to the elements and weather.

- **2.xx Self-contained spa:** A spa or hot tub that was manufactured or pre-fabricated and intended for the immersion of persons in heated water circulated, treated, and filtered in a closed loop system. The water is not intended to be drained and filled after each use. A spa or hot tub may be portable and typically includes the following systems or components integral to the spa: filter(s), heater(s), pump(s), drain(s), skimmer(s), chemical treatment system(s), and control system. Other equipment such as lighting, blowers, etc. may be added to the equipment compartment.

- **2.xx operating water level:** Level at which the water must be maintained to enable proper water circulation and skimming.

- **2.xx outside use:** A product that is designed, tested or certified for use outside or to exposed to the elements and weather.

- **2.xx sealed:** Fabricated without openings to prevent entry of liquid.

- **2.xx skid pack:** A separate collection of components that are not an integral part of a pool, spa, or hot tub such as but not limited to filters, pumps, heaters, controls, fittings, pipes, skimmers that are to be installed in accordance with the manufacturers specifications.

[^6]: ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2859 www.ASTM.org

[^7]: IAPMO, 5001 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org
2.xx spa/hot tub (exercise spa, swim spa, therapy spa, resistance system): A unit which is not usually drained, cleaned or refilled for each individual. It may include, but not be limited to, hydro jet circulation, hot water or cold water mineral baths, air induction bubbles, or any combination thereof. A portable or non-portable water basin intended for the immersion of persons in temperature-controlled water circulated in a closed system, and not intended to be drained and filled with each use. It is manufactured to factory specifications using specific design, plumbing, components, and suppliers such that the water is circulated, treated, and filtered via closed loop system. This may include certain systems or components integral to the spa including but not limited to tub or shell structure and support system, steps and seats, hand hold(s) and rail(s), filter(s), pump(s), suction fitting(s) or drain(s), water return fittings, skimmers, piping, tubing, hose, other air or water distribution fitting(s), resistance exercise equipment, heater(s) [solar, electric, or gas], chemical treatment system(s), control system, jets, lighting, blowers, A/V equipment or as part of a separate manufacturer specified assembly or skid-pack. A water basin may contain specific features and equipment to produce a water flow intended to allow physical activity including, but not limited to, exercising or swimming in place, hydro-therapy, resistance exercise or flotation and are designed to allow for an unobstructed volume of water large enough to allow these activities.

2.xx waterline: Top of the overflow outlet of the spa.

4.1.9 Spas and Hot Tubs

Spas and hot tubs shall conform to the requirements of Section 19 Spas and Hot Tubs and/or NSPI-6 as well as the material requirements of Section 3 of this Standard.

19 Spas and hot tubs

19.1 General

This establishes evaluation and testing criteria including health and performance requirements for spas and hot tubs. The criteria addresses manufactured, self-contained, portable, and pre-fabricated spas and hot tubs including requirements for the materials, design and construction, performance of spa components, including those involved in the circulation, filtration, heating and sanitation of spa water. This section contains health and performance requirements for spas. This section addresses manufactured, self-contained, portable, non-portable and pre-fabricated spas and hot tubs including requirements for the materials, design and construction, performance of spa components.

The section does not establish requirements for the installation of spas or spa components.

19.2 Materials

Spa materials contacting spa water shall meet the health effects and corrosion resistance requirements of 3 of this standard.

Plastic piping system components for spa use shall meet the latest requirements of one of the following:
19.2.1 Rigid plastic piping shall meet the requirement of NSF/ANSI 14.

19.2.2 Flexible reinforced (helical or fabric) plastic spa hose shall meet the requirements of this Standard and IAPMO PS-33.

19.2.3 Flexible non-reinforced plastic spa hose shall meet the requirement of 3 and Annex A of this Standard.

19.2.4 Fitting shall meet the requirement of 3 and Annex A of this Standard or NSF/ANSI 14.

19.3 Electrical components

All relevant electrical components shall meet the requirements of ANSI/UL 1563 or other electrical standard as specified in this section.

19.4 Design and construction

19.4.1 General

Spas shall be designed and constructed to prevent the accumulation of dirt and debris, and to facilitate the inspection, maintenance, servicing and cleaning. There shall be no protrusions, extensions, or other obstructions that create an entanglement hazard in the bathing area.

Spas marked as “indoor use” only shall have the exterior surfaces of spa sealed to prevent leakage or splashing of spa water into the mechanical equipment areas in accordance with ANSI/UL1563, Water exposure test, section 54.2 Splashing and 54.3 Seal test.

Spas marked a “outdoor use”, “indoor and outdoor use”, or not marked shall have the exterior surfaces of spa sealed to prevent leakage or splashing and precipitation of spa water into the mechanical equipment areas in accordance with ANSI/UL1563, Water exposure test, section 54.2 Splashing, 54.3 Seal test and 54.4 Simulated rain.

19.4.2 Accessibility

Water and air circulation system components including pumps, motors, blowers, and filters, shall be accessible for inspection, maintenance, repair and/or replacement.
19.4.3 Spa shell or tub

19.4.3.1 Spa shell or tub: Surface material, strength, and slip resistance

Plastic activity spa shells shall comply with the following meet the requirements of:

- ANSI Z124.1.2, section 5.2 Stain resistance; and
- ANSI Z124.7

- Section 4.3 Surface testing;
- Section 4.4 Subsurface testing;
- Section 5.1 Colorfastness testing;
- Section 5.2 Wear and cleanability;
- Section 5.3 Cigarette test;
- Section 5.4 Chemical resistance;
- Section 6.1.2 Hydrostatic load requirements;
- Section 6.2 Empty unity loading test;
- Section 6.3 Point Impact testing (upon rim and seat);
- Section 7.1 Flammability (UL 94 HB or HBF rating) or Section 5.6 Ignition of ANSI/IAMPO Z124.1.2;
- Section 8.1 Water resistance; and
- Section 8.2 Thermal Shock.

1. Spa shell materials not covered under the scope of ANSI Z124.7 shall meet the applicable performance requirements specified in ANSI Z124.7.

2. Surfaces within the spa intended primarily for footing (steps) shall be slip-resistant, as defined by the requirements of ASTM F462, Standard Consumer Safety Specification for Slip-Resistant Bathing Facilities.

19.4.3.2 Step surfaces

19.4.3.2.1 Spas steps shall be marked with color contrasting edge markings.

19.4.3.2.2 Steps and stepping surfaces within the activity spa intended primarily for ingress/egress footing shall be slip-resisting, as defined by the requirements of the following:
19.4.3.3 Spa Water depth

19.4.3.3.1 Spas shall be marked with color contrasting depth markings.

19.4.3.3.2 General use Spa water depth at any seat or bench intended for use as a step when entering or exiting the spa shall not exceed 24 in (62 cm).

19.4.3.3.3 General use Spas with multi-level seating to address tall users shall not exceed 28 in (71 cm) water depth for any seat or sitting bench, as measured from the waterline.

19.4.3.3.4 Special use spas such as those designed for exercise such as swimming, therapy or other special purpose may exceed a depth of 48 in (122 cm).

19.4.3.4 Spa floor slope

General use Spa floors shall have a slope not exceeding one inch per foot (maximum pitch 1:12).

- Special use spa floors shall have a slope conforming to the requirements of the regulatory authority having jurisdiction.

19.4.4 Steps, handholds and handrails

For general use applications:

19.4.4.1 If the spa is designed with steps for entering, step treads shall have a minimum unobstructed horizontal depth of 10 in (25.4 cm) and a minimum unobstructed surface area of 240 in² (1550 cm²).

19.4.4.2 Riser heights shall be consistent and no less than 7 in (17.78 cm) and no greater than 12 in (30.48 cm). If the bottom tread serves as a bench, the bottom riser may be a maximum of 14 in (35.56 cm) above the spa floor.

19.4.4.3 If the spa rim is designed by the manufacturer for use as a step, a handrail shall be recommended by the manufacturer for installation by the installer provided. The handrail shall not be readily removable.

19.4.4.4 When used or recommended by the manufacturer, handrails shall be made of corrosion resistant materials such as polymeric materials or metal such as SS304 or better.

19.4.4.5 When used or recommended by the manufacturer, handholds shall be made of corrosion resistant materials such as polymeric materials or metal such as SS304 or better. The handhold shall not be positioned higher than 9 in (23 cm) above the operating water level.
19.4.5 Barriers and layers of protection

Safety barriers and layers of protection may help reduce certain risk when installed on a spa system. Some examples of layers of protection include use of barriers to entry such as fences, pool and spa covers and alerts to entry such as alarm devices.

19.4.5.1 The manufacturer may recommend or supply a barrier of protection that complies with one of the following:
- Fences, certified to ASTM F1908, F2286;
- Door walls with alarms, certified to ANSI/UL 2017;
- Gates with alarms, certified to ANSI/UL 2017; or
- Safety covers, certified to ASTM F1346.

19.4.5.2 Safety covers

If recommended or supplied by a spa manufacturer, Spas may include a lockable safety cover shall be provided it has been tested and certified to comply with the requirements of ASTM F1346 “Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs”. However, there is no substitute for constant and vigilant adult supervision.

NOTE – Always consult and comply with the local regulatory authority having jurisdiction regarding spa safety, barriers, and the layers of drowning protection required for private and public use spas. However, there is no substitute for constant and vigilant adult supervision.

19.4.6 Lighting

If a spa has submerged lighting, such lighting shall meet the relevant requirements of ANSI/UL 1563 “Standard for Electric Hot Tubs, Spas and Associated Equipment”.

19.5 Circulation system

19.5.1 General

Spas shall have a circulation, filtration, and treatment system consisting of equipment such as pumps, piping, fittings, valves, return inlets, suction outlets, filters, skimmers, and other necessary components that provide circulation of water throughout the spa. The circulation system shall be capable of:

- Private use spas shall produce a circulation turnover rate of the total water volume of the spa through the filtration system within 30 minutes when operated at the maximum flow rate of the filter in a clean media condition.
- Private use spas may produce a circulation turnover rate of the total water volume of the spa through the filtration system at least once every 24 hour period when the spa is not in use such as in stand-by mode to reduce energy consumption and comply with energy efficiency requirements.
Public use spas shall produce a circulation turnover rate of the total water volume of the spa through the filtration system within 30 minutes or more quickly as determined by the local regulatory authority having jurisdiction. Always consult local regulations for water circulation rate.

Public use spas shall not have a stand-by mode to reduce circulation and filtration rate below the minimum required by public health authority having jurisdiction.

19.5.1.1 The circulation system shall be capable of producing a 30 min or less volumetric turnover of the spa system when operated at the maximum flow rate of the pump and filter in a clean media condition. Always consult local regulations for required water circulation rate.

19.5.1.2 The piping from the skimmers and suction fittings shall be hydraulically balanced such that when piping is split between two fittings, the lengths of the piping shall be equal to aid in balanced flow.

19.5.1.3 The manufacturer of the spa shall either supply or recommend the specific equipment for installation. The specification shall reference one or more manufacturer(s) and include model or size of the equipment as it applies to the circulation, filtration, and treatment system.

The following items shall be supplied with the unit or recommended by the manufacturer for installation with the unit:

- filter(s), complying to this Standard;
- pump(s), complying to this Standard;
- primary disinfection system complying to this standard such as:
  - mechanical chemical feeder,
  - flow through chemical feeder,
  - in-line electrolytic or brine batch type chemical generator
- circulation piping (pressure and suction);
- circulation fitting(s), manifold(s), etc.;
- valve(s);
- skimmers;
- water return inlet(s); and
- water suction outlet(s) or suction fitting(s).

The following items may be specified by the manufacturer for installation with the unit:

- secondary treatment systems complying to this Standard such as:
  - Ozone treatment systems;
  - UV treatment systems;
  - Copper/Silver ion systems

19.5.1.2 Circulation system Design and performance requirements

The spa shall be tested with the manufacturer’s recommended or provided piping, fittings, filter, pump, and other components as a circulation system for compliance with the following:

Circulation performance
1. The entire system shall be designed with 2 or more water return fittings to aid in circulation of the water within the spa or equipment.

2. The entire system shall circulate water through the filter at a rate equal to or greater than the flow rate required to turn-over the volume of the spa within 30 min or less.

3. The entire system shall meet or exceed the 70% turbidity reduction requirement when tested using Sil-co-sil 106 (a #140 silica), after 5 volumetric turnovers in accordance with 5, and Annex B.

4. The entire system shall also meet or exceed 70% reduction of challenge particulates 20 micron and larger when tested using Arizona A3 medium test dust, after 5 volumetric turnovers in accordance with 5, and Annex B.

19.5.2 Pumps

NOTE – Spa or swim spas utilizing a non-self contained skid-pack with a pump(s) shall comply with the requirements of this section.

19.5.2.1 All pumps and filtration systems components shall meet the requirements of: be designed and sized to supply sufficient flow rate to operate the filter and meet the required 30 min turn-over rate. The water circulation pumps with a rating of 5 HP (3.7 kW) or less shall meet the spa requirements of this Standard and ANSI/UL 1081.

— NSF/ANSI 50— Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities; and


19.5.2.2 Labeling, mounting, access, and support

Pump horsepower rating and labeling shall not exceed the brake horsepower of the motor. Pumps shall be mounted per pump manufacturer’s specifications. Pumps shall be accessible for inspection, service, and maintenance. Pumps shall be supported to prevent damage to the pump and piping due to settling or other movements.

19.5.3 SVRS, suction outlets, exercise resistance systems, vacuum fittings and water return fittings

19.5.3.1 Suction outlet fittings, and SVRS

Spas that utilize a SVRS shall comply with AMSE A112.19.17 or ASTM F2387.

19.5.3.2 Suction outlet fitting used in water circulation

Spas that utilize submerged suction outlets shall comply with ANSI/APSP -16. Each suction fitting shall be installed in accordance with its certified ratings as it relates to:

- installation orientation (floor or wall);
- installation configuration (single or dual); and
- maximum flow rating for the specific opening to which the fitting is affixed.
All suction outlets shall be certified to the latest requirements of ANSI/ASME A112.19.8 by an independent 3rd party.

Suction fittings for use in spas shall have a flow rate which equals or exceeds the maximum flow rating of the specific opening when tested as described in:
1. ASME A112.19.8, and
2. ANSI/APSP-7, and

There shall be at least one unblockable drain in the spa as defined in ASME A112.19.8 and by the U.S. Consumer Product Safety Commission (CPSC), or

There shall be two or more suction outlets as specified in ANSI/APSP-7:
1. Section 4.6 for minimum flow rating for each cover/grate, and
2. Section 4.7 for dual cover/grate separation, or

There shall be a single outlet and an SVRS:
1. Safety vacuum release system that has been certified by an independent 3rd party to either ASME/ANSI Standard A112.19.17 or ASTM F2387.

19.5.3.3 Suction outlet fittings used for use in exercise spa, therapy spa or resistance systems

Spas that utilize submerged suction outlets for use in exercise or resistance systems shall be tested to the requirements of ANSI/APSP-16.

19.5.3.3.1 The fitting (as installed in the spa/tub unit) shall be tested to the applicable requirements of the ANSI/APSP-16 including finger and limb entrapment, horizontal and vertical load, corrosion resistance, fastener testing, pull load, vacuum impact (if system can generate vacuum), UV light exposure, fitting design and materials, point load to excess, shear load etc.

19.5.3.3.2 Suction fittings for use in spa equipment shall be tested in the exercise spa to verify that the suction fitting and pumping system (propeller, paddlewheel, centrifugal pump, etc.) do not exceed the acceptable hair entrapment and body block hold down forces when tested in accordance with ANSI/APSP-16. Where the system has power controls or adjustability, the system shall be tested under worst case condition of maximum flow rate and greatest power of the exercise resistance system.

19.5.3.4 Specialty vacuum fittings

Each spa that is provided with a specialty vacuum fitting (used to temporarily install a hose for vacuuming the spa floor) shall have the fitting tested and certified to the requirements of:

1. IAPMO SPS 4, Special use suction fittings, and
2. NSF/ANSI Standard 50, Section 3 material formulation requirements.

If spa vacuum cleaning fitting (used to temporarily install a hose for vacuuming the spa floor) is utilized it shall be installed outside the spa shell in a location inaccessible to spa users. If provided within the spa, the spa vacuum cleaning fitting shall be installed with a lockable specialty vacuum closure fitting which complies with the requirements of 3 and IAPMO SPS 4.
19.5.3.5.1 Fittings that return water to the spa shall comply with this Standard for corrosion resistance and material safety.

19.5.3.5.2 The entire system shall be designed with 2 or more water return fittings to aid in circulation of the water within the spa system.

19.5.4 Filters

NOTE – Spa or swim spas utilizing a non-self contained skid-pack with a filter(s) shall comply with the requirements of this section

19.5.4.1 All filters, pumps and filtration system components shall be designed and sized to supply sufficient flow rate to operate the filter and meet the required turnover rate. The filter shall meet the requirements of this Standard and ANSI/UL 1081;

--- NSF/ANSI 50 – Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities

--- ANSI/UL 1081 – Standard for Swimming Pool Pumps, Filters and Chlorinators

19.5.4.2 Separate filter data plate and operational instructions are not required if the filter information is provided in the spa or equipment manual.

19.5.5 Surface skimmers/weirs and overflows or perimeter grating

All surface skimmers shall meet the requirements of:

--- NSF/ANSI 50 – Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities; and

--- Skimmers shall be externally vented to atmosphere whether integral to the spa or not: (example, a vent hole in the skimmer cover or lid, or other means).

Skimmers integral to the spa shall meet the requirements, but a separate skimmer data plate and operational instructions are not required.

The spa shall be designed to draw water from the top via one or more of the following: perimeter overflow grating, gutter system, or skimmers to aid in rapid removal of floating debris and contaminants.

19.5.5.1 Recessed surface skimmers

19.5.5.1.1 All recessed surface skimmers shall meet the requirements of 3 and 8:

19.5.5.1.2 The entire system shall be designed with 2 or more skimmers.

19.5.5.1.3 Skimmers shall be externally vented to atmosphere whether integral to the spa or not: (example, a vent hole in the skimmer cover or lid, a vented entry to the skimmer weir, or other means).

19.5.5.1.4 Systems shall be marked either on the skimmer face or shell structure with their ideal operating water level and acceptable range.
19.5.5.1.5 For skimmers integral to the spa, a separate skimmer data plate and operational instructions are not required.

19.5.5.2 Non-recessed surface skimmers

19.5.5.2.1 All non-recessed (has no skimmer lid/cover on deck) surface skimmers shall meet the requirements of 3.:

- NSF/ANSI 50 – Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities, Section 3 materials formulation and corrosion resistance, and

19.5.5.2.2 Skimmer and housing, when installed in the spa, shall have at least 2 of the following design safety features:

- external vacuum break on the skimmer throat entry.
- housings, whose inlet may be closed during part of the operation cycle, shall not sustain damage or permanent deformation when exposed to a negative pressure of 25 in Hg (85kPa).
- skimmers shall be installed with a vacuum vent line externally vented to atmosphere on the suction piping from the skimmer housing whether integral to the spa or not.

19.5.5.2.3 Skimmer strainer basket shall be easily removable for cleaning.

19.5.5.2.4 The entire system shall be designed with 2 or more skimmers

19.5.5.2.5 Skimmer strainer basket volume shall comply with this Standard.

19.5.5.2.6 Open area dimensions shall comply with this Standard.

19.5.5.2.7 Skimmer trimmer valves shall comply with this Standard, when used.

19.5.5.2.8 Skimmer weir, a non-recessed skimmer shall have a weir that operates freely with continuous action and adjusts automatically to variation in water levels over the manufacturer prescribed operating water level at the maximum flow rate of the spa.

19.5.5.2.9 The skimmer system shall be evaluated for entrainment of air through the skimmer system. The skimmer system shall be capable of 50% of flow to the filter without air entrainment when the system is operated at the spa manufacturer’s recommended operating water level.

19.5.5.2.10 Systems shall be marked either on the skimmer face or shell structure with the operating water level or acceptable range of water level.

19.5.5.3 Perimeter overflow grating or gutter system

19.5.5.3.1 All recessed perimeter overflow grating or gutter system shall meet the requirements of this Standard:

- NSF/ANSI 50 – Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities
19.5.5.3.2 Systems shall be marked either on the gutter, overflow system or shell structure with their ideal operating water level and acceptable range.

19.6 Air Blower and air induction systems

The requirements of this section apply to integral systems that induce or allow air to enter the spa either by means of a power pump or passive design:

19.6.1 Air blower systems shall prevent water backflow toward the device via one or more of the following mechanisms:

- Backflow prevention valve;
- Hartford loop i.e. piping loop to prevent water backflow; or
- Installation height of the blower is above the water line.

19.6.2 Air intake sources shall not introduce water, dirt or contaminants from outside the spa unit, into the spa;

19.6.3 Integral air passages shall be able to withstand 150% the manufacturer’s maximum rated working pressure for a minimum of 5 min.

19.6.4 Air blower tubing shall meet or exceed the tubing performance requirements of this Standard or IAPMO PS 33.

19.7 Temperature control systems, heaters and controls

19.7.1 Temperature control

Each spa shall have a temperature-regulating control that is in conformance with ANSI/UL 1563 “Standard for Electric Hot Tubs, Spas, and Associated Equipment”, including requirements for:

- maximum set point corresponding to a water temperature of 40 °C (104 °F) in the tub; and
- tolerance at the maximum temperature setting of not more than ± 3 °C (± 5 °F).

19.7.2 Temperature limits

Each spa shall have a temperature-limiting control that is in conformance with ANSI/UL 1563 including requirements for:

- limiting the water at the inlet to the tub to a maximum temperature of 50 °C (122 °F); and
- tolerance at the maximum temperature setting of not more than ± 3 °C (± 5 °F).

19.7.3 Temperature display

Each spa shall have a display in one degree increments (°F or °C) reflecting the spa water temperature. This display shall be located on the top surface or side of the spa and shall be readily visible to persons prior to entry. The display shall conform to ANSI/UL1563, Section 35.4.2 display tolerances of ± 1 °C (± 2 °F).

19.7.4 Heater
The heater shall be stable and stationary after plumbing and electrical connections are completed. The minimum clearances to combustible materials, as specified by the heater manufacturer, shall be maintained. All heaters and system components shall meet the requirements of this Standard and ANSI/UL 1261.

--- NSF/ANSI 50 — Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities; and

--- Electric Water Heaters for Pools and Tubs.

19.8 Sanitation and treatment systems

19.8.1 Water sanitation via chlorine and bromine

Water sanitation in the spa shall be accomplished using chemicals registered by the United States Environmental Protection Agency (USEPA) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as recommended in the manufacturer's manual. The applicable requirements of this Standard shall apply to equipment recommended or supplied by the spa manufacturer for use in chlorine/bromine sanitation. Systems shall be of the following types and shall meet the applicable requirements of this standard:

19.8.1.1 Spa disinfection systems shall be sized to meet varying regulatory requirements. The spa manufacturer shall specify or require at least one size/type system of Level-1, Level-2, or Level-3 disinfection system be installed. The spa manufacturer shall recommend or supply disinfection systems capable of meeting one or more of these levels:

- Level 1—provide a minimum of 3 lbs of chlorine per day per 1,000 gal of spa water volume.
- Level 2—provide a minimum of 1.5 lbs of chlorine per day per 1,000 gal of spa water volume.
- Level 3—provide a minimum of 0.5 lbs of chlorine per day per 1,000 gal of spa water volume.

19.8.1.2 Spa systems for public use shall not require direct or hand feeding of disinfection/oxidation chemicals except in extreme cases such as super-chlorination or water balancing. Systems shall be of one or more of the following types and shall meet the applicable requirements of Mechanical chemical feeding systems (see 9), Flow through chemical feeding systems (see 10), Electrolytic in-line or batch chlorine/bromine generators (see 14), Electrolytic batch or off-line chlorine/bromine generators (see 15) or Automatic chemical controller (see 17).

19.8.1.3 Water sanitation equipment integral to the spa shall meet the requirements, but a separate data plate and operational instructions are not required if the information is contained within the spa.

Systems for use in public applications shall not require direct or hand feeding of chemicals except in extreme cases such as super-chlorination or water balancing.

19.8.1.4 Spa or swim spas utilizing a non-self contained skid-pack with a chemical treatment system(s) shall comply with the requirements of this section.
19.8.2 Supplemental water sanitation and treatment

NOTE – Spa or swim spas utilizing a non-self contained skid-pack with supplemental treatment equipment shall comply with the requirements of this section

19.8.2.1 The applicable requirements of this Standard shall apply to any equipment supplied by the spa manufacturer for use in treatment of spa water, including ozone (see 12), UV light systems (see 13), and Copper and silver ion generators (see 16).

- Ozone systems, including Sections 11 and 12;
- UV light systems, including Sections 11 and 13; and
- Copper and silver ion generators, including Sections 11 and 16.

19.8.2.2 Supplemental water treatment equipment integral to the spa shall meet the requirements, but a separate data plate and operational instructions are not required.

NOTE – Always consult and comply with the local regulatory authority having jurisdiction regarding supplemental sanitation and treatment equipment requirements and system sizing.

19.9 Data plate

Each spa shall have a data plate that is permanent and easy to read. The data plate shall have, at a minimum, the following information:

- manufacturer’s name and contact information (address, phone number, website or prime supplier);
- model and serial number;
- maximum number of users (bathers);
- maximum recommended temperature;
- recommended spa water quality parameters, including pH, temperature, sanitizer level (such as 3-5 mg/L (ppm) Free Available Chlorine, or 4-6 mg/L (ppm) Total Bromine and a statement to consult local regulatory authority having jurisdiction;
- reference to using EPA registered chemical disinfectants;
- date of manufacture;
- dry weight, water capacity, and filled/occupied weight and
- specific certification mark of the certifying organization for certified products.

19.10 Owner’s manual
A comprehensive manual or manual package shall be provided with each spa covering important areas such as spa operation, maintenance, water quality monitoring, and safety. For spas utilizing components certified under this Standard, separate component manuals shall be included in the manual package. If the spa component is integral to the spa, equivalent information shall be provided in the spa manual.

19.10.1 General spa safety

This section shall include, at a minimum, the following information:

- electrical hazards;
- drowning hazards;
- Appropriate injury and health hazards; and
- Barriers (see 19.4.5)

When a spa system is installed, safety, barriers, and layers of protection may help reduce risk. Examples of layers of protection include use of barriers to entry such as fences, pool and spa covers and alerts to entry such as alarm devices. The manufacturer may recommend or supply a barrier or layer of protection provided it has been tested and certified to one of the following standards:

- Personal immersion alarms certified to ASTM F2208;
- Fences, certified to ASTM F 1908, ASTM F 2286;
- Door walls or gates with alarms, certified to UL 2017, and
- Safety covers, certified to ASTM F 1346, the spa manufacturer may recommend or supply a lockable safety cover provided it has been tested and certified to the requirements of ASTM F1346.

NOTE – Always consult and comply with the local regulatory authority having jurisdiction regarding spa safety, barriers, and the layers of drowning protection required for public use spas. There is no substitute for constant and vigilant adult supervision.

19.10.2 Spa specifications

This section shall include, at a minimum, the following information:

- maximum number of users (bathers);
- footprint dimensions;
- spa height;
- effective filtration area;
- heater output;
- water capacity;
- dry weight;
- filled weight, assuming average occupant weight of 175 lbs;
- dead weight, assuming average occupant weight of 175 lbs;
- electrical requirements; and
- general description of how the spa operates.
19.10.3 Installation instructions

Installation instructions shall include, at a minimum:

- site preparation;
- ventilation instructions, if installed indoors;
- spa leveling procedure; and
- electrical requirements and precautions.

19.10.4 Operating instructions

Operating instructions shall include, at a minimum:

- start-up and refill procedures and frequency;
- jet control operations;
- temperature adjustment operations; and
- lighting control, if appropriate.

19.10.5 Spa care and maintenance instructions

Maintenance instructions shall include, at a minimum:

- draining instructions;
- filter system maintenance, including filter cartridge removal, cleaning, and installation;
- care instructions for spa shell, exterior, and cover;
- instructions for winterizing and prevention of freezing; and
- vacation care instructions.

19.10.6 Water quality and maintenance instructions

Water quality instructions shall include, at a minimum:

- methods for testing the spa water (test kit methods should be based on Standard Methods for the Examination of Water and Wastewater, APHA, 20th Edition (or latest edition), 1998);
- methods for adding chemicals to the water;
- methods for maintaining the proper water chemistry;
- recommended water quality parameters shown in the informative Annex O;
- basic chemical safety guidelines;
- recommended test frequency;
- statement specifying use of EPA registered chemicals for spa sanitation; and
- statement reading “Maintaining your sanitizer at the recommended levels at all times will decrease the occurrence of unsafe bacteria in your spa water” (or equivalent).
19.10.7 Service information

Service information shall include, at a minimum:

- troubleshooting guide;
- warranty;
- contact information for manufacturer;
- list of serviceable components/parts; and
- statement that consumer should not attempt to repair non-serviceable components.