

ASME A112.19.8-2007

[Revision of ASME/ANSI A112.19.8M-1987 (R1996)]

Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs

AN AMERICAN NATIONAL STANDARD



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Mechanical Engineers**

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FOREWORD

The initial work on a standard for suction fittings was undertaken by a Committee of the International Association for Plumbing and Mechanical Officials (IAPMO). Their activity resulted in their Product Standard SPS-1 for suction fittings, which was used as a benchmark for the performance of such devices. At IAPMO's suggestion, the SPS-1 standard was offered to ASME for conversion into a national consensus standard. In order to undertake this challenge, a Task Group of A112 Panel 19 was formed to write this Standard.

The original edition of this Standard was approved by the American National Standards Institute (ANSI) on November 23, 1987.

Since the 1987 publication of this Standard, studies continued on the issues of hair test samples, hair entanglement, and pump analysis. Actual human tests have shown significant differences in the behavior of a full head of hair as compared to the previous specimen of only two ounces (approximately a half head of hair) that was concentrated on a 1 in. dowel, rather than distributed on a head that allows blockage of a larger area of a cover/grate.* Test procedures have been revised accordingly. This revision of the original Standard reflects the results of such studies and subsequent experience.

Work is ongoing on entrapment by swelling of skin on the downstream side of a cover/grate which can create a mechanical lock. Another aspect is the ability of skin to separate from the body and conform to the shape of the cover/grate. This can occur with high differential pressure commonly associated with small, single cover/grate connected to a single point, direct suction.

Research has shown the potential for body entrapment decreases when a seal cannot be formed over a suction outlet cover/grate. The use of large size cover/grates, or if a large size is not used, small suction outlets that do not mount flat and flush with the surrounding surface are helpful in this regard. The hazard of body entrapment is primarily addressed by the proper selection of a large size outlet cover/grate, which is unblockable, or with the proper installation of more than one suction outlet spaced apart or positioned on different planes to prevent simultaneous blockage. Alternatively, body entrapment is inhibited through the use of indirect suction, such as gravity flow systems.

Accident summaries have shown the necessity for designing cover/grates so that they are held firmly in place over the suction outlet sump. When fasteners are used for this purpose, manufacturers are strongly encouraged to use captive screws and threaded inserts, or deep thread depths

with sufficient receiving material. The use of self-tapping fasteners is discouraged where repeated inspection and/or service is likely, such as public and semi-public installations or where access to a hydrostatic valve is necessary. Any loose, degraded, broken, or missing cover/grate requires the immediate closing of the facility until the problem with the cover/grate is fully corrected.

Wherever possible, suction fittings should be tested with the end use product to confirm compliance with this Standard. For example, packaged spa systems should be tested to confirm compliance, including an evaluation of the foot well for body entrapment hazards associated with large adults. In this regard, the 1995 edition of ASME A112.19.7 covering whirlpool bathtub appliances was amended to integrate testing for suction fittings, which are used in such appliances; therefore, reference to whirlpool bathtubs within this Standard have been deleted.

The structural tests included in this Standard are intended to evaluate the integrity of the suction fitting, the suitability of the material(s) for the intended installation environment, and addressing the problem of broken suction cover/grates, which statistics show to be one of the leading causes of body and limb entrapments.

The potential for body entrapment is also addressed by the proper installation of more than one suction outlet. Sample installation procedures are found in the Uniform Swimming Pool, Spa and Hot Tub Code, published by the International Association of Plumbing and Mechanical Officials (IAPMO), 5001 East Philadelphia Street, Ontario, CA 91761. The standards for public and private swimming pools and spas published by the Association of Pool and Spa Professionals (APSP), 2111 Eisenhower Avenue, Alexandria, VA 22314, also provide similar guidance. See also ANSI/NSPI-1 Standard for Public Swimming Pools, ANSI/NSPI-2 Standard for Public Spas, ANSI/NSPI-3 Standard for Permanently Installed Residential Spas, ANSI/NSPI-4 Standard for Aboveground/Onground Residential Swimming Pools, ANSI/NSPI-5 Standard for Residential Inground Swimming Pools, and ANSI/NSPI-6 Standard for Residential Portable Spas. ASME has developed a standard (ASME A112.19.17) for safety vacuum release systems that should be investigated when evaluating the overall suction hazard potential of pools and spas and proper safety measures to be taken, as well as a similar standard by ASTM referenced as ASTM F 2387-04.

Suggestions for improvement of this Standard are welcome. They should be sent to The American Society of Mechanical Engineers; Attn: Secretary, A112 Standards Committee; Three Park Avenue; New York, NY 10016-5990.

ASME A112.19.8-2007 was approved by the American National Standards Institute on February 5, 2007.

* Throughout this Standard, the words "cover/grate" are used with the full meaning "suction fitting."

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Standardization of Plumbing Materials and Equipment

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CORRESPONDENCE WITH THE A112 COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, A112 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the edition, the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation. When appropriate, proposals should be submitted using the A112 Project Initiation Request Form.

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The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject: Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition: Cite the applicable edition of the Standard for which the interpretation is being requested.
Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The A112 Standards Committee schedules meetings as needed, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the A112 Standards Committee. The A112 home page contains information on future meeting dates and locations.

SUCTION FITTINGS FOR USE IN SWIMMING POOLS, WADING POOLS, SPAS, AND HOT TUBS

1 GENERAL

1.1 Scope

1.1.1 General Requirements. This Standard establishes materials, testing, and marking requirements for suction fittings that are designed to be totally submerged for use in swimming pools, wading pools, spas, and hot tubs, as well as other aquatic facilities.

1.1.2 Definition. Suction fittings shall be defined as all components, including the sump and/or body, cover/grate, and hardware.

1.1.3 Compliance. Demonstration of compliance for this Standard is merely an indication that the product meets performance requirements and specifications contained in this Standard.

1.1.4 Revisions. The provisions of this Standard shall not be construed to prevent the use of any alternate material or method of construction provided any such alternate meets the full intent of the standard.

1.1.5 Exclusions

1.1.5.1 Skimmers shall be excluded from evaluation to this Standard.

1.1.5.2 Vacuum connection covers shall be excluded from evaluation to this Standard.

1.1.6 Types of Suction Fittings

1.1.6.1 General. A manufacturer or designer of any suction outlet cover/grate shall indicate under which Type the cover/grate is listed.

1.1.6.2 Field Fabricated Outlets. All nonmanufactured suction outlets constructed in the field with individual components shall be considered as "Field Fabricated Outlets."

1.1.6.3 Venturi Outlets. All venturi activated in-direct suction outlets or venturi activated debris collection systems shall be considered as "Venturi Outlets."

1.1.6.4 Swim Jet Combination Fittings. All swim jet combination fittings that combine suction and discharge into one housing, creating a high velocity, high volume stream of water to swim, jog, or walk against, as well as massage, shall be considered "Swim Jet Combination Fittings."

1.1.6.5 Submerged Suction Outlets. All other suction outlets for use in swimming pools, wading pools, spas, and hot tubs, as well as all other aquatic facilities, shall be considered as "Submerged Suction Outlets."

1.1.7 Single or Multiple Usage

1.1.7.1 Cover/grates that pass the body entrapment portion of this Standard as well as meeting all other requirements in this Standard shall be permanently marked "For Single or Multiple Drain Use," "For Single Drain Use," or "For Multiple Drain Use Only" at the manufacturer's option.

1.1.7.2 Cover/grates that fail the body entrapment portion of this Standard or any other requirements of this Standard may not be certified under this Standard.

1.2 Related Standards

Since the scope of this Standard is directly related to suction fittings, it is important to mention that the fittings themselves represent only one portion of the suction entrapment scenario. Several other standards, including but not limited to, ANSI/NSPI-1, -2, -3, -4, -5, -6, and -8, ANSI/IAF-9, as well as ASME A112.19.17, and ASTM F 2387-04, as outlined in para. 1.4, should be consulted so as to provide coverage for the various other aspects of this potential hazard in swimming pools, wading pools, spas, and hot tubs.

1.3 Units of Measurement

When values are stated in U.S. Customary units and in the International System of Units (SI), the values stated in U.S. Customary units shall be considered as the standard.

1.4 References

The following standards are referenced in this document. Unless otherwise specified, the latest edition shall apply.

- ANSI/IAF-9, Aquatic Recreation Facilities
- ANSI/NSPI-1, Standard for Public Swimming Pools
- ANSI/NSPI-2, Standard for Public Spas
- ANSI/NSPI-3, Standard for Permanently Installed Residential Spas
- ANSI/NSPI-4, Standard for Aboveground/Onground Residential Swimming Pools