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Staying Afloat

Creating new evaluation criteria for floatation and sensory deprivation systems

NSF standards have been written for conducting design assessments, performance and safety testing, and disinfection efficacy testing of many different product types. Often, NSF writes a new protocol or standard to address a product type that lacked certain barometers or measures of quality. That is the case with the 2013 publication of the NSF CCS-12804: Component Certification Specification for Sensory Deprivation and Floatation Systems or Related Equipment.

NSF has a long history of creating and updating the evaluation/certification criteria for a variety of pool, spa and water park equipment under the standard NSF/ANSI 50. NSF has been testing and certifying products for the pool/spa industry since 1960. Criteria in NSF/ANSI 50 now are referred to or required in public health codes, construction codes and other guidelines.

NSF International has become one of the most trusted names in public health by writing national standards and certifying products to help ensure the safety of recreational water products. NSF is widely recognized for its scientific and technical expertise in the environmental and health sciences. NSF International is a Pan American Health Organization/World Health Organization Collaborating Center on Food Safety, Water Quality and Indoor Environment. Due to this history of service to the industry and technical credentials, NSF was asked by public officials and product manufacturers to address the topic of floatation and sensory deprivation systems.

Previously, floatation and sensory deprivation systems either were not addressed at all or only addressed in a simplistic manner, leaving the facility owners and public health at a disadvantage. Public health and building officials didn’t have comprehensive code language to help specify the design or maintenance of facilities, which an increasing number of people throughout North America are using every day. Without appropriate industry and public health standards, codes and guidelines, there could be significant health safety issues.
To address the issues, NSF contacted product manufacturers and public health officials seeking the most conservative and protective approaches to floatation system design and operation. From there, NSF incorporated its experience from working with the pool, spa, hot tub and water park industries. The resulting criteria strike a balance between the two different applications.

The criteria developed thus far will continue to be further optimized to meet the needs of all stakeholders, including public health and safety officials, floatation system users, floatation system facility operators and equipment manufacturers.

Floatation and sensory deprivation systems generally comprise a vessel or tank in which a person floats in a shallow depth of fluid. The system also has associated water circulation, heating and treatment systems, and likely an air circulation system, since most tanks are designed to be an enclosed, relaxing, quiet and dark environment. The fluid is typically about 12-18 inches deep and consists of potable water and many pounds of dissolved Epsom salt (primarily magnesium sulfate). Typically the water is heated and the salt dissolves, creating water that is 1.2-1.3 times denser than drinking water. The greater density enables the user to comfortably float without effort.

The current NSF testing protocol CCS-12804 has a vast array of evaluation and testing requirements. Many of the requirements for performance testing were derived from existing criteria in NSF/ANSI 50 and incorporated with other testing requirements. For many decades, NSF/ANSI 50 has been used to evaluate, test and certify many types of products for material safety, corrosion resistance, structural burst safety performance, functional performance and microbiological disinfection efficacy.

The scope of CCS-12804 includes factory-built floatation systems, as well as systems that are assembled on site. CCS-12804 includes the following design criteria and testing requirements:

1. Material safety evaluation and testing criteria for the water contact parts and materials used in the construction of the floatation system
2. Minimum 5-minute water turnover rate and circulation performance testing through the treatment system and back into the tank
3. Safety slip resistance testing of steps or standing portions of the system
4. Mandatory disinfection efficacy testing at NSF by following the manufacturer recommended cleaning process
5. Disinfection performance testing of the water treatment systems using two different microorganisms, requiring a minimum 3-log, or 99.9 percent, kill performance of the cleaning system
6. Use and performance testing of supplemental disinfection and treatment systems, such as ultraviolet light or ozone systems
7. Testing of ozone off gassing
8. Requirements for performance testing of chemical feeding systems
9. Criteria for the assessment of air blower and air induction systems
10. For systems with primary and secondary treatment systems, disinfection testing using only the secondary systems (e.g. ozone, UV, etc.) to ensure overall system performance to achieve a minimum 3-log kill of the closed challenge bacteria
11. Simulated 3,000 hour life testing of the entire treatment system, including the filtration, circulation and disinfection system equipment
12. Disinfection performance testing after the simulated 3,000 hour life testing to ensure the system still achieves the required 3-log kill of the bacteria
13. Operational safety and protection of the users and operators as it relates to the cleaning and disinfection system
14. Performance testing of contaminant removal performance via minimum 70 percent turbidity reduction testing of the filtration equipment
15. Performance testing of filtration system cleanability after the filter media has been soiled
16. Performance testing for the pump systems and sizing in relation to the filtration system
17. Requirements for the performance of the fittings, piping, valves, skimmer water intakes and return systems and other aspects of the circulation system
18. Performance testing of step, handle and hand-hold strength and loading
19. Performance testing criteria for the structure and lining of the vessel of the floatation system to assess impact, tear, tensile strength and other factors
20. System data plate markings and operation and user instructions for system installation, cleaning and maintenance, as well as warnings to operators and users

The NSF/ANSI 50 Joint Committee Task Group on Floatation Systems is currently conducting meetings to develop example code language for public health officials to reference and incorporate. The group also is reviewing CCS-12804 (http://info.nsf.org/Certified/Pools/12804.pdf) for possible updates based on input from participants. If you would like to learn more or participate in the task group, contact Mindy Costello at mcostello@nsf.org.

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