Standards for Residential Water Treatment Products

Whether you are new to the industry, a seasoned water treatment specialist or somewhere in between, understanding the standards that apply to residential water treatment products can be a daunting task.

By Mark Unger

There are many different standards that apply to residential water treatment products, but for the most part, residential water treatment products can be separated into three categories: systems (units), components and chemicals. Each category can be broken into subcategories that depend on product type and anticipated end use.

Drinking Water Treatment Units for Residential Water Treatment

Drinking water treatment unit (DWTU) standards cover different types of products and treatment technologies but are similarly structured. All complete systems must be evaluated for materials safety, structural integrity (if subject to line pressure), product performance and product literature, labeling and packaging. In most cases, manufacturers may choose to test and certify as many performance reduction claims that fit their product, but at least one reduction claim must be successfully completed to achieve a complete system certification.

Water Filters

NSF/ANSI 42 covers residential water filters making aesthetic (non-health-related or taste and odor) contaminant reduction claims. The most common certified reduction claims under NSF/ANSI 42 include chlorine, chloramines, iron, manganese, hydrogen sulfide, pH adjustment, particulate reduction and bacteriostasis.

NSF/ANSI 53 covers residential water filters making health-related contaminant reduction claims. The most common certified reduction claims under NSF/ANSI 53 include individual organic contaminants, fluoride, nitrate/nitrite, metals, VOC reduction and mechanical filtration.

The WQA S-200 standard also covers residential water filters making aesthetic and health-related claims. This standard references NSF/ANSI 42 and 53 for all performance, structural integrity and materials safety testing but also allows materials safety compliance by providing proof that all wetted materials are compliant to the U.S. Federal Code of Regulations, Title 21.

Reverse Osmosis Systems

The NSF/ANSI 58 standard covers residential reverse osmosis (RO) systems. At a minimum, all RO systems must undergo a total dissolved solids (TDS) reduction test that includes daily production rate, percent recovery and efficiency testing. The most common elective reduction claims chosen for RO systems to be certified under NSF/ANSI 58 include fluoride, nitrate/nitrite, perchlorate, metals and mechanical filtration.

The WQA S-300 standard also covers residential RO systems. This standard references NSF/ANSI 58 for all performance, structural integrity and materials safety testing but also allows materials safety compliance by providing proof that all wetted materials are compliant to the U.S. Federal Code of Regulations, Title 21.

Water Softeners

The NSF/ANSI 44 standard covers residential cation exchange water softeners. NSF/ANSI 44 requires all water softeners to be evaluated for pressure drop, rated softening capacity, water consumed during regeneration, salt efficiency, rinse effectiveness (chlorides remaining after regeneration), accuracy of the brine system and softening performance. Systems that satisfy the requirements of the standard for rated softening capacity and contain 100% sulfonated polystyrene di-vinyl benzene cation exchange media may also make barium and radium surrogate reduction claims based on studies that show barium and radium are effectively reduced when hardness is reduced to below 1 grain per gallon.

The WQA S-100 standard also covers residential cation exchange water softeners. It references NSF/ANSI 44 for all performance, structural integrity and materials safety testing but also allows materials safety compliance by providing proof that all wetted materials are compliant to the U.S. Federal Code of Regulations, Title 21.

UV Microbiological Systems

NSF/ANSI Standard 55 covers ultraviolet (UV) systems for residential water treatment. UV systems can be separated into two classes. Class A systems are designed to inactivate or remove microorganisms from contaminated water. Class B systems are designed for additional treatment of a disinfected public drinking water supply or other drinking water supply that has been tested and deemed acceptable for human consumption by the appropriate governing body. Class B systems are designed to reduce normally occurring nonpathogenic nuisance microorganisms only.

Distillation Systems

The NSF/ANSI 62 standard covers residential distillation units. Common certified reduction claims for distillation units include TDS (with production rate verification), fluoride, nitrate, metals and microbiological reduction.

The WQA S-400 standard also covers residential distillation systems. This standard references NSF/ANSI 62 for all performance, structural integrity and materials safety testing but also allows materials safety compliance by providing proof that all wetted materials are compliant to the U.S. Federal Code of Regulations, Title 21.

Become better acquainted with the standards that apply to residential products

Shower Filters

NSF/ANSI 177 covers residential shower filtration systems making aesthetic contaminant reduction claims. The main reduction claim in NSF/ANSI 177 is free available chlorine, but the standard also requires structural integrity and a materials review to ensure compliance is achieved.

Residential Water Treatment Products Covered by Multiple Standards

Some DWTU products fall under more than one standard and, if the manufacturer of the system decides, can be certified to more than one standard.

In these cases, structural integrity and material safety are only conducted once based on the standard that provides the worst-case test parameters. Product literature, packaging and labels must meet the requirements of all standards to which a product is certified.

DWTU Components for Residential Water Treatment

Components of point-of-use (POU) DWTU products can be certified according to the standards mentioned above. Component testing and certification always requires materials safety testing and may require structural integrity if the component is pressure bearing. Some components, such as filter cartridges and RO membranes, which can be used for obtaining certification for performance claims, may have performance testing conducted during the certification process. In most cases, this data would be only used by the manufacturer or used as a listing note as part of the component's certification because the component manufacturer has little control of the conditions in which the component is used in the field.

Point-of-entry (POE) components used for residential water treatment are covered by NSF/ANSI 61 for materials safety compliance. The NSF/ANSI DWTU standards reference NSF/ANSI 61 for all materials extraction testing conducted on POE products.

Drinking Water Chemicals

Drinking water chemicals are evaluated according to NSF/ANSI 60. Chemicals are tested and certified based on a maximum use level in drinking water. Testing ensures that these chemicals are safe for use in drinking water and do not add harmful contaminants.

Still confused about the standards that apply to residential water treatment products, components and chemicals? ANSI-accredited product certification bodies, such as the WQA, UL and NSF handle certifications to these standards every day. Please contact one if you are interested in product or component certification for residential water treatment. *wqp*

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