

Standards and Certification for POU and POE Treatment Devices

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EPA Implementation Guide

- ✦ If an ANSI Standard is available, only those products independently certified to the Standard may be used for the purpose of compliance.
- ✦ References all six NSF/ANSI Standards that exist today for POU/POE treatment devices.

Six Drinking Water Treatment Standards

- ★ Standard 42; Aesthetic Claims.
 - ★ Adsorption and absorption media.
 - ★ Mechanical filtration.
- ★ Standard 53; Health Claims.
 - ★ Adsorption and absorption media.
 - ★ Mechanical filtration.
- ★ Standard 44; Water Softeners.
- ★ Standard 55; Ultraviolet Microbiological.
- ★ Standard 58; Reverse Osmosis.
- ★ Standard 62; Distillation.

Origin of Standards

- ✦ Industry desire for level playing field.
 - ✦ Test methods
 - ✦ Claims
- ✦ EPA and State Agencies seeking independent, credible demonstration of performance and reliability
 - ✦ Direct impact on regulated water.
- ✦ Consumer need for assistance to help in making informed product purchasing decisions.

History: Water Treatment Unit Standards

- 1973** NSF Standard **42** Adopted; Aesthetic Claims.
- 1980** NSF Standard **53** Adopted; Health Claims.
- 1981** NSF Standard **58** Adopted; Reverse Osmosis.
- 1987** NSF Standard **44** Adopted; Softeners.
- 1989** NSF Standard **62** Adopted; Distillation.
- 1990** All Became American National Standards.
- 1991** ANSI/NSF Standard **55** Adopted; Ultraviolet

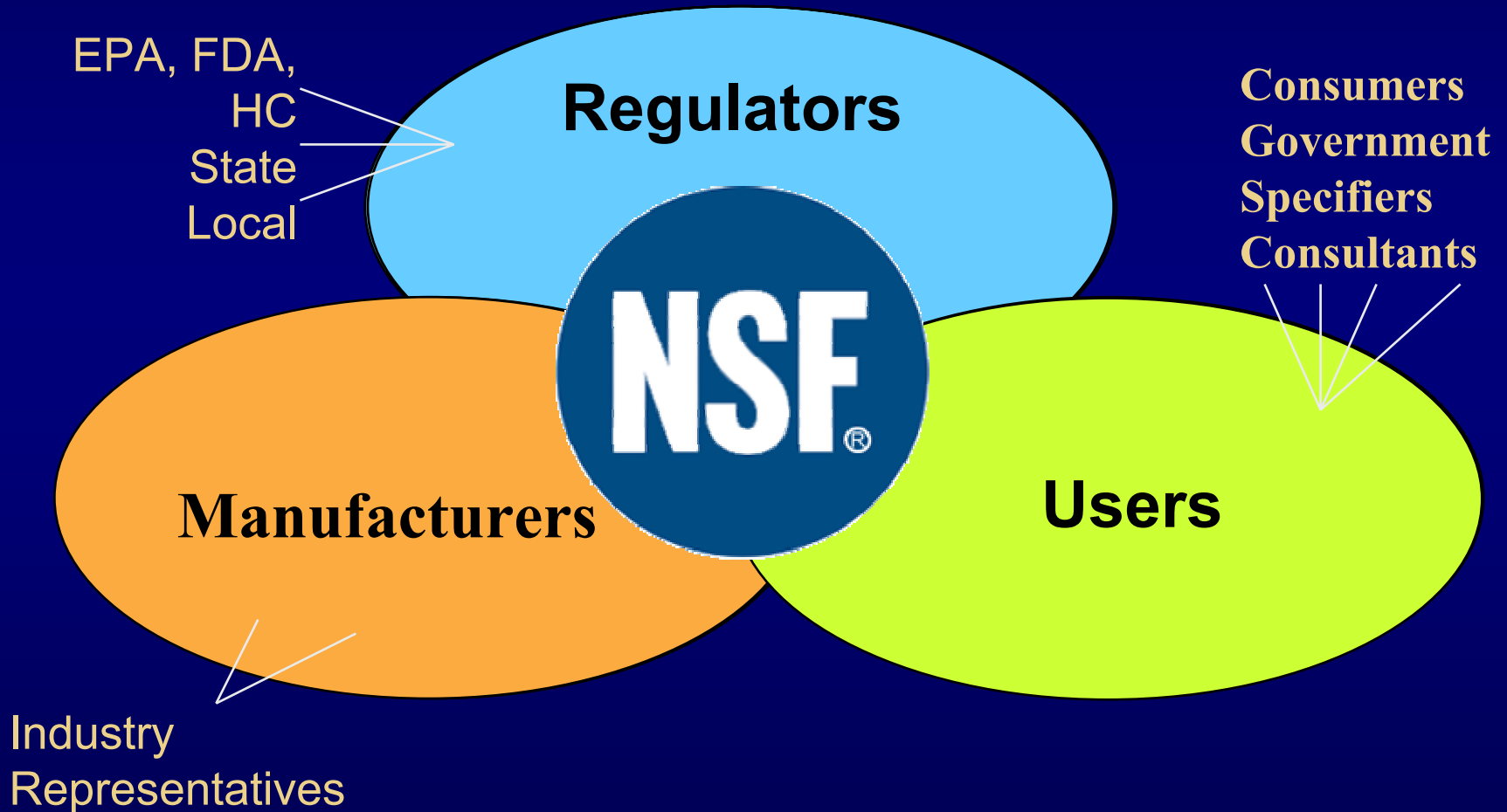
Who is ANSI?

American National Standards Institute

★ Accreditation of:

- ★ Product Certifiers
- ★ Quality Management System Registrars
- ★ Standards Developers
 - ★ Once approved by ANSI, an NSF Standard becomes an American National Standard, e.g. NSF/ANSI Standard 42

NSF Consensus Standards



Water Treatment Standards

- ✦ Systems designed for reduction of specific substances that may be present in drinking water supplies (public or private)
- ✦ Supplies considered to be microbiologically safe and of known quality

Rationale for Drinking Water Treatment Unit Standards

- ✦ Focus is always on Consumer Protection and Public Health.
- ✦ Minimum requirements, but conservative.

Drinking Water Treatment Unit

- ✱ Point-of-use: treatment at a single tap or multiple taps, and not for the majority of the facility.
- ✱ Point-of-entry: treat all or part of the facility at the point of inlet to the entire facility.
- ✱ Mostly residential and small commercial (restaurant, office, child care).

Style of Systems

- ✦ Counter-Top Manual Fill.
- ✦ Counter-Top Connected to Sink Faucet.
- ✦ Faucet Mount.
- ✦ Personal Water Bottle.
- ✦ Plumbed-In.
- ✦ Plumbed-In to Separate Tap.
- ✦ Point-of-Entry.
- ✦ Pour Through.

Content of Drinking Water Treatment Unit Standards

- ✦ Mandatory requirements for all:
 - ✦ Material Suitability.
 - ✦ Structural Integrity.
 - ✦ Product Literature.
- ✦ Options, as selected by Manufacturer:
 - ✦ Demonstration of Performance for Individual Contaminant Reduction Claims.

Material Evaluation

- ✦ In depth review of all materials in contact with drinking water.
- ✦ Intent: No contaminants being added to the water by the treatment device.
- ✦ Two-part Evaluation
 - ✦ Formulation review.
 - ✦ Extraction testing.

Material Formulation Information

All Ingredients.

- ✱ Source of supply.
- ✱ Chemical description.
- ✱ Use levels of ingredients.
- ✱ Reference to U.S. CFR Title 21 and/or other supporting documentation.

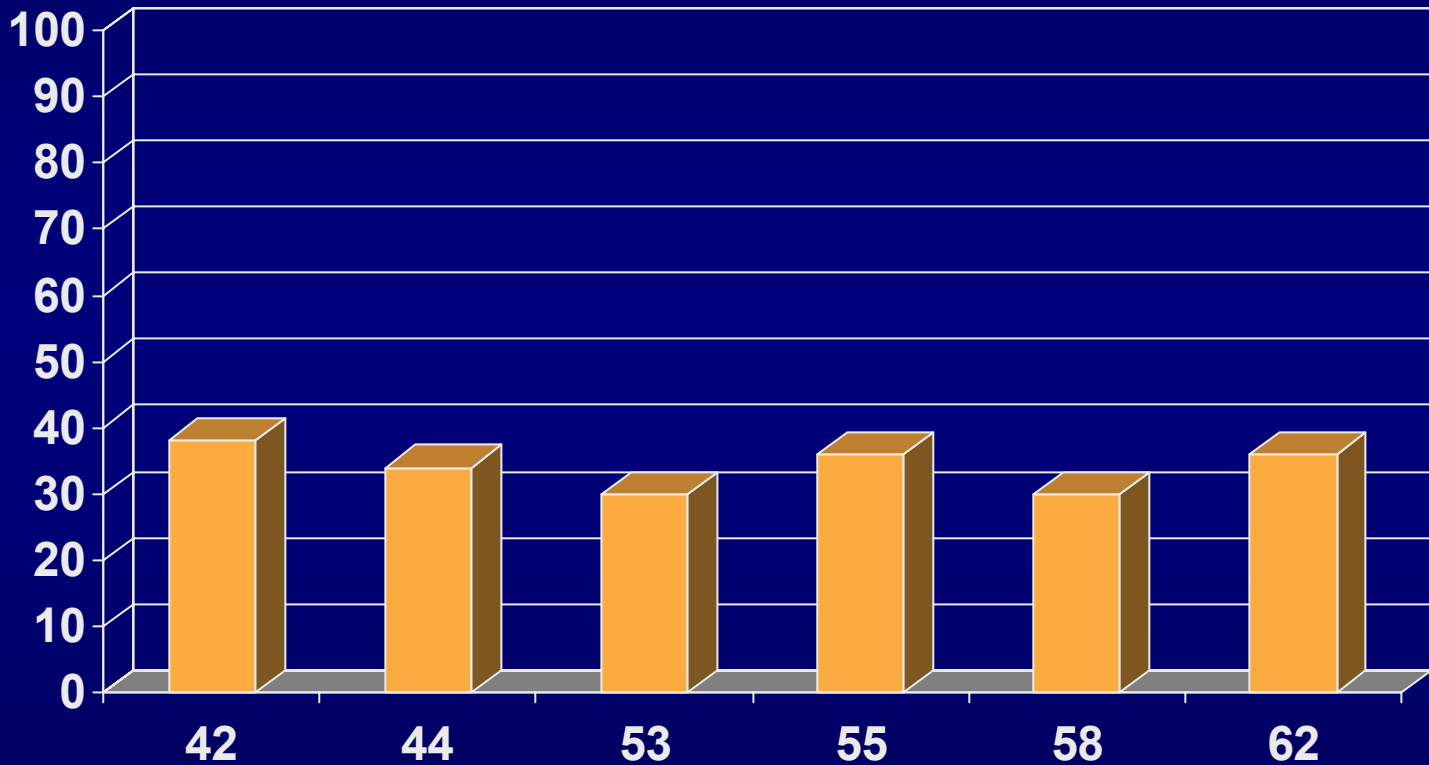
Material Extraction Testing

- ✦ Systems with adsorptive or absorptive media extracted with and without media.
- ✦ Complete systems are used for testing.
- ✦ Product flushed and conditioned as per manufacturers use instructions.
- ✦ 72 hour exposure; samples every 24 hrs.
- ✦ Low TDS/chlorinated tap water.

Material Extraction Testing

- ✦ Full chemical analysis of water.
- ✦ Results compared to maximum allowable levels.
 - ✦ Maximum Drinking Water Level (MDWL)
 - ✦ Advisory Concentration
- ✦ Manufacturer can vary conditioning and/or materials to reduce contaminant levels.

Material Extraction Failure Rates



Structural Testing

- ✦ Intent: product will not structurally fail when subjected to use conditions.
- ✦ Testing represents extreme conditions (spikes) and life of use (repeat cycling).
- ✦ Determined based upon product type.
- ✦ Three general tests.
 - ✦ Burst pressure test.
 - ✦ Hydrostatic pressure test.
 - ✦ Cyclic test.

Product Literature and Labeling

- ✱ Installation, operation and maintenance instructions.
- ✱ Data plate.
- ✱ Replacement component labeling.
- ✱ Performance data sheet.

Testing for Performance Claims

- ✦ Manufacturer selects from many options (chemical, microbiological, particulate).
- ✦ Tested with actual contaminated water.
- ✦ Water Flow similar to home use.
- ✦ Two systems tested (duplicate) and both must pass.

Conservative Testing

- ✱ Accelerated testing.
- ✱ Maximum flow rate.
- ✱ High influent challenge levels.
- ✱ Tested beyond claimed capacity.
- ✱ One capacity per model.

Capacity Testing

- ✱ Aesthetic claims; tested to 100% claimed capacity.
- ✱ Health claims.
 - ✱ 200% if no performance indication device (accounts for poor user estimation of water use and delayed cartridge replacement); or
 - ✱ 120% if has performance indication device.
 - ✱ Either way, product must pass at higher capacity, but only make claim of 100%.

Performance Indication Devices

- ★ Requirement of EPA Product Selection Criteria:

- ★ Warning Device.
- ★ Automatic Shut-Off.

- ★ NSF/ANSI Standards Address Performance Testing:

- ★ Must actuate between +10% and -20% capacity

Performance Claims: Options

- ✦ Organic compounds: 60+.
- ✦ Inorganic compounds: 22.
- ✦ Asbestos, particulate, turbidity.
- ✦ Bacteriostasis, disinfection (bacteria, virus), cysts.
- ✦ Taste and odor.

Influent Challenge

- ✦ Established using “occurrence” data, if available.
 - ✦ U.S. Geological Survey.
 - ✦ U.S. EPA.
 - ✦ Challenge set at 95% occurrence.
- ✦ Alternatively, 3 times the regulated level (whichever is higher).

Maximum Effluent Criteria

- ✪ Regulated level for safe consumption.
 - ✪ U.S. EPA, Health Canada and World Health Organization (WHO).
 - ✪ Maximum level throughout test (can fail if one sample exceeds).
 - ✪ Averaging of samples allowed for aesthetic, but not for health claims.

Certification Overview

- ★ Complete disclosure of product information from manufacturer
- ★ Product testing
- ★ Plant Audit
- ★ Certification
- ★ Annual Unannounced Audits
- ★ Periodic retesting to ensure continued compliance

ANSI Accreditation of Certifiers

- ★ Recognized Accreditation body in the U.S. for product certification organizations.
- ★ Accreditation is product category specific.
- ★ International Standard of compliance:
 - ★ ISO Guide 65.
 - ★ Personnel, process, laboratories, auditors all evaluated.

State Regulations and Plumbing Codes

★ States Regulating POU/POE include:

- ★ California
- ★ Iowa
- ★ Wisconsin
- ★ Massachusetts

★ Plumbing Codes include:

- ★ Uniform Plumbing Code (UPC)
- ★ International Plumbing Code (IPC)
- ★ Southern Building Code Congress International (SBCCI)
- ★ Quebec Construction Code

NSF Certifications by Standard

Standard	Companies	Products
42	146	2514
53	82	790
58	67	561
44	12	316
55	6	32
62	3	31