STANDARDS UPDATE NOTICE (SUN)
ISSUED: May 12, 2023

STANDARD INFORMATION

Standard: NSF/ANSI 50
Standard ID: Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities [NSF/ANSI/CAN 50:2021]
Previous Standard ID: Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities [NSF/ANSI/CAN 50:2020]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **June 1, 2024**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn.

Overview of Changes:

- New requirements for Floatation or Sensory Deprivation Systems and Related Equipment
- Modified requirements for regenerative media filter testing
- New requirements for sieve analysis methods
- Updates language relating to display resolution
- Additional testing protocol for UV reactors
- Updates regarding validation of UV dose displays

Specific details of new/revised requirements are found in table below.

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are underlined and deletions are shown ~~lined out~~ below. New requirements for which additional evaluation or testing may be necessary (depending on applicability to the listed product) are shaded in light gray
6	Info	**Filters**
6.1		**General** The requirements in this section apply to filters for use in the recreational water industry. These include, but are not limited to: – diatomite-type; – sand-type; – cartridge-type; – high-permeability-type; and – precoat-type (diatomite-type) filters; – membrane-type; and – ultrafiltration-type filters. Precoat media-type filters will be considered regenerative when there is a designed pause in operation where the manufacturer's instructions describe a method for, or a means or mechanism is provided to release the filter aid from the element(s) with a repositioning of this filter aid into a new filter cake to extend the length of the filter run. Precoat filters that operate intermittently at set times during a day without replacing the filter cake shall not be considered regenerative media filters. Any claims of enhanced filter performance such as but not limited to finer filtration or water savings shall require validation of claims during performance testing. The additional testing protocol for validation of these claims shall be agreed upon by the filter manufacture and testing agency before starting any performance testing. The pass/fail criteria shall be based on confirmation of the enhanced performance claims being repeatably met.
6.1.4		**Initial head loss** The head loss through a filter operating at the design flow rate shall not exceed the manufacturer's maximum design head loss when determined in accordance with Section N-2.3. This requirement shall apply to full flow, side stream, or cross flow installation parameters. Precoat media-type filters that regenerate the precoat media filter cake shall be tested in accordance with Section N-2.3 after the media has been conditioned as described in Section 6.1.9.1. Manufacturers of regenerative precoat filters may specify separate head loss claims for media that is at the beginning and end of

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		the regeneration life or may specify one head loss curve that is not exceeded by the observed head loss when the precoat media is new or at the end of the media life.
6.1.8		**Cleaning of filter media** The cleaning of filter media in accordance with the manufacturer's instructions shall render the filter media and elements free of visible dirt and debris. For precoat type filters, this shall be checked by a visual inspection of the internals of the filter after soiling per Annex N-2, Section N-2.4 and cleaning in accordance with the manufacturer's instructions, but prior to reintroduction of any filtration media. Inspection may be carried out via disassembly of the filter housing or another suitable means agreed upon by the filter manufacturer and laboratory. Tubular up-flow regenerative precoat-media type filters shall be inspected for residual precoat media between adjacent elements near the mounting surface of the elements and shall have an average depth not exceeding 5% of the total length of the element, rounded up to the nearest 1/4 in, that extends beyond the mounting surface support plate. For constant flux systems, the head loss through the filter after cleaning the media shall not exceed 150% of the initial head loss through the filter. The head loss through the filter after cleaning shall not exceed the manufacturer's maximum design head loss. For constant pressure systems, the indicated flow after cleaning shall not be less than 81.6% of the initial indicated flow. The flow through the filter after cleaning shall not be less than the manufacturer's minimum design flow rate. Testing shall be conducted in accordance with Section N-2.4.
6.1.9		**Turbidity reduction** A filter shall reduce water turbidity by 70% or more when tested in accordance with Section N-2.5. Regenerative precoat media-type filters that release filter cake and reposition into a new filter cake without replacement of the filter aid shall be tested for conformance with the turbidity reduction requirements of Section N-2.5 with new precoat and again after the media has been conditioned as described in Section 6.1.9.1. Precoat media-type filters that operate intermittently without replacing the filter cake shall condition the filter as outlined in Section N-2.5.4.c before moving to Section N-2.5.4.d of the turbidity reduction testing outlined in Section N-2.5. Following each turbidity measurement after each tank volume, the filter shall be subject to a period of no operational flow (pause) lasting a minimum of 10 ± 1/2 min.

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6.1.9.1		***New clause added;*** **Regenerative media conditioning** Start with a new application of precoat media and start to recirculate clean water (< 2 NTU) through the filter. Initiate injection into the inlet piping of the filter a slurry of ball clay and baby oil, in a relative proportion conforming with Section N-2.4.3.1, to achieve a filter influent turbidity of 10 ± 1.0 NTU, until the pressure drop of the filter increases by 50%, or if the manufacturer recommends a maximum pressure drop, inject the solution of ball clay and baby oil until the pressure drop increases by 50% or the until the maximum pressure drop recommended by the manufacturer is achieved, whichever is less. Stop injection of the ball clay and baby oil and regenerate the precoat media in accordance with the manufacturer's instructions. Repeat this soiling / regeneration process until one of the criteria below has been achieved: — for regenerative filters which determine the end of life of a charge of media based on time, repeat once for each day of the lifespan of a charge indicated by the manufacturer's instructions; or — for regenerative filters which determine the end of life of a charge of media based on the number of regenerations, repeat a number of times equal to the number of regenerations permitted by the manufacturer's instructions; or — for regenerative filters which determine the end of life of a charge of media based on the pressure conditions observed after regeneration, repeat until the pressure conditions observed after regeneration meet the manufacturer's recommended conditions for replacing the media; or — if the lifespan of a charge of media is defined by the manufacturer's instructions using a combination of the criteria detailed above, repeat until the first criteria indicated by the manufacturer's instruction has been achieved. NOTE — As the conditioning procedure outlined in Section 6.1.9.1 may result in a filter condition that quickly increases in differential pressure upon exposure to any additional loading, for purposes of testing for compliance to the precoat filter post-conditioning turbidity reduction requirement, and with the manufacturer's consent. The turbidity reduction test that is performed after conditioning per Section 6.1.9.1 may be started with the filter having a differential pressure higher than that recommended by the manufacturer for initiating a cleaning cycle.

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6.1.10		***New clause added;*** **Ultrafine filtration microorganism removal** A full-stream filter shall provide a minimum LRV of 2.0 when tested in accordance with NSF/ANSI 419 Section 6 and as specified in Annex C, Section C.3. A partial or side-stream filter shall provide a minimum LRV of 2.0 when tested in accordance with NSF/ANSI 419 Section 6 and as specified in Annex C, Section C.3 for the manufacturer's specified number of turnovers. Systems that are comprised of more than one filter shall have each filter evaluated according to its filter type test method, and a system log reduction may be awarded with consideration given to flow rates and log reduction values of the individual components.
6.1.11	Info	**Cryptosporidium parvum oocyst reduction**
6.1.11.1		A filter manufacturer may make a C. parvum log reduction claim up to a maximum of 1.0 log. A filter claimed by the manufacturer to reduce C. parvum shall be tested in accordance with Section N-2.9. The verified C. parvum log reduction determined in accordance with Section N-2.9 shall be noted on the data plate: — regenerative precoat media-type filters that release filter cake and reposition into a new filter cake without replacement of the filter aid shall be tested for conformance with the Cryptosporidium reduction requirements of Section N-2.9 with new precoat and again after the media has been conditioned as described in Section 6.1.9.1.
6.1.12		***New clause added;*** **Test media** The manufacturer shall specify the type of media that is used in the filter for qualification to Sections 6.19 and 6.1.10. If a media is not specified, the default will be as follows: – Sand-type filters: the default media used shall be sand that complies with Section 6.3.4.1; and – Precoat filters: the default media shall be diatomaceous earth.
6.2	Info	**Precoat media-type filters**
6.2.6	Info	**Data plate**
6.2.6.1		A precoat media-type filter shall have a data plate that is permanent, easy to read, and securely attached to the filter housing at a readily accessible location. The data plate shall contain the following information:

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		— manufacturer's name and contact information (address, phone number, website, or prime supplier); — filter model number; — filter serial number; — effective filtration area in square meters or square feet; — if applicable, the statement: "This precoat filter utilizes tube elements and the effective filtration area represents the uncoated area." — required clearance (vertical and horizontal for service and maintenance); — design flow rate in LPM or GPM; — working pressure, if applicable; and — steps of operation. The data plate shall indicate whether a filter is designed for swimming pool applications only or spa / hot tub applications only. A filter designed for both applications shall be exempt from this requirement.
6.3	Info	**Sand-type filters**
6.3.4	Allowance for Additional medias upon request	***New clause added;*** **Filter media** The default sand media used for performance testing shall conform to the following characteristics. Alternate sand replacement medias may be qualified with sand type filters upon request by filter manufacturer.
6.3.4.2		***New clause added;*** Effective size and uniformity coefficient evaluation shall be performed in accordance with ASTM C1369 with sieves conforming to ASTM E11.9 A minimum of five data points shall be measured for sizing. The particle size data shall be plotted as a smooth curve, which shall be used to read the sieve opening sizes at which 60% and 10% of particles can pass. The uniformity coefficient and effective size measured shall be ± 10% of the claimed uniformity coefficient and effective size or shall be within the claimed range of uniformity coefficient and effective size, whichever is larger.
6.3.4.3		***New clause added;*** Media sampling for sieve analysis shall be conducted in accordance to AWWA B100-16, Section 5.2.
6.5		***New section added;*** **Membrane filters** The requirements in this subsection apply only to membrane filters and their integral components designed for the filtration of swimming pool or spa / hot tub water. See standard for details.

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9	---	**Valves**
9.1		This section contains requirements for valves, automated valves, and manufactured manifolds used on filters in public and residential swimming pools and spas / hot tubs. The requirements apply to the housing, valve, handle, or valve mechanism and other components that are integral parts of the valve or multiport valve. An automated valve with integrated automated controller functions shall also comply to Section 19.
13	Info	**Filtration media**
13.2	Info	**Sand and alternate sand-type filter media**
13.2.2	Info	**Sand filter media**
13.2.2.3		***New clause added;*** Media sampling for sieve analysis shall be conducted in accordance to AWWA B100-16 Section 5.2.
14	Info	**Ozone generation process equipment**
14.19		**Disinfection efficacy** Ozone generation process equipment designed for supplemental disinfection shall demonstrate a 3 log (99.9%) or greater inactivation of influent bacteria when tested according to Section N-8.1. Ozone generation process equipment designed for secondary disinfection shall demonstrate a 3 log (99.9%) or greater reduction of C. parvum when tested and evaluated according to Section 14.20. Ozone generation process equipment designed for supplemental disinfection shall carry the following information in the installation and use instructions and be noted in the official certification listings: "This unit has demonstrated an ability to provide 3-log inactivation of Pseudomonas aeruginosa and Enterococcus faecium. This product is designed for supplementary disinfection and is intended for use with appropriate residual levels of EPA registered disinfecting chemicals. Specific residual levels of EPA registered disinfecting chemicals may be required by the regulatory agency having authority." Ozone generation process equipment designed for secondary disinfection shall carry the following information in the installation and use instructions and be noted in the official certification listings:

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		"This unit has been tested to confirm a minimum inactivation equivalent of 3 log (99.9%) C. parvum in accordance with NSF/ANSI/CAN 50, Section N-8.4. This product has met the requirements of NSF/ANSI/CAN 50, Section N-8.1: Disinfection Efficacy, for the ≥ minimum of a 3-log (99.9%) reduction of Enterococcus faecium [ATCC #6569] and Pseudomonas aeruginosa [ATCC #27313].26. This product is intended for secondary disinfection and is intended for use with appropriate residual levels of EPA registered disinfecting chemicals. Specific residual levels of EPA registered disinfecting chemicals may be required by the regulatory agency having authority."
14.20		**Cryptosporidium reduction** Manufacturers of an ozone generation system with a claim of C. parvum reduction shall demonstrate a minimum of 3 log (99.9%) or greater reduction of C. parvum in a single pass when tested in accordance with Section N-8.4. ~~The ozone generation system shall reduce the number of live C. parvum oocysts from an influent challenge of at least 5000 (5 × 103) infectious oocysts per liter by at least 99.9% when tested in accordance with Section N-8.3.~~ The C. parvum oocysts shall be from a calf source. The viability shall be greater than 50% determined by excystation.27. The oocysts shall be stored with 1,000 IU/mL penicillin and 1,000 µg/mL streptomycin at 39 °F (4 °C) and shall be used within 8 wk of collection. The live C. parvum oocysts shall not be inactivated by any means including chemical or UV irradiation prior to passing through the ozone generation system. NOTE — It has been reported that the oocyst wall of viable oocysts may deform. Excystation is performed as an indication of the potential of the oocyst wall to deform and is not done to measure the infectivity of the organism. The process equipment shall be provided with an effective means to alert the user when a component of this equipment is not operating.
14.21		**Operation and installation instructions** Drawings and a parts list for easy identification and ordering of replacement parts shall be furnished with each unit and shall include: — model number of the unit; — instructions for proper size selection and installation; — operation and maintenance instructions; — a statement of the manufacturer's warranty; — applicable caution statements (prominently displayed); — ventilation requirements (if applicable); — cross connection protection (if the unit is physically connected to a potable water supply);

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		— a warning, if the potential exists for release of high dosages of substances that may endanger bathers; — output rate (in pounds or kilograms per day or hour); — maximum daily operation time (if not designed for continuous operation; and — a statement identifying if the unit is suitable for supplemental disinfection or for secondary disinfection.
14.23		**Data plate** Data plate(s) shall be permanent; easy to read; and securely attached, cast, or stamped onto the unit at a location readily accessible after normal installation. Data plate(s) shall contain the following: — manufacturer's name and contact information (address, phone number, website, or prime supplier); — model number; — serial number or date of manufacture; — certification mark of the ANSI-Accredited testing and certification organization; — electrical requirements (volts, amps, hertz) for operation; — type of feed-gas; — rated feed-gas flow rate (SCFH or LPM); — rated ozone production (grams per hour [g/h] or pounds per day [lb/d]); — method of cooling and coolant flow rates; — level of disinfection certification (supplemental or secondary); — maximum daily operation time (if not designed for continuous operation); — caution statements (prominently displayed) including a statement that the unit should be used with an EPA registered disinfection chemical to impart a measurable residual concentration in the water; and — a statement identifying if the unit is suitable for supplemental disinfection or for secondary disinfection.
15	Info	**Ultraviolet (UV) light process equipment**
15.5	Info	**Performance indication**
15.5.2		***New clause added;*** A supplemental (for all pools and spas) UV system shall indicate that a sufficient UV dose is being produced for supplemental disinfection whenever the unit is at an intensity reading greater than or equal to the highest intensity reading observed during disinfection efficacy testing required by Section 15.8.2. Whenever the unit is at an intensity reading less than the highest intensity reading observed during disinfection efficacy testing required by Section 15.8.2, the unit shall display a warning that there is insufficient dose for supplemental disinfection.

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15.6	Info	**Operation and installation instructions**
15.6.2		UV systems ~~claiming inactivation of cysts~~ certified for supplemental (for all pools and spas) disinfection, the installation and operational instructions or product manual shall contain the following: — reactor configuration type (U, S, etc.); — number of lamps per reactor; — lamp designation or model number; — sensor designation or model number; — UVT of water (minimum value or a range of UVTs under which validation was performed); — organism used in testing; — correlation between test organism and C. parvum; — effective log inactivation of organism at maximum flow rate or validated flow rates; — effective UV dose delivered at specified intensity and flow rate; and — whether the system has a mechanical cleaning system or requires an external chemical cleaning system installed per Section 15.13.1.
15.6.3		***New clause added;*** UV systems certified for secondary disinfection, the installation and operational instructions or product manual shall contain the following: – reactor configuration type (U, S, etc.); – number of lamps per reactor; – lamp designation or model number; – sensor designation or model number; – UVT of water (minimum value or a range of UVTs under which validation was performed); – organism used in certification testing; – effective log inactivation of organism at maximum flow rate or validated flow rates; – effective UV dose delivered at specified wavelength intensity and flow rate; and – lamp cleaning instructions.
15.7		**Data plate** Data plate shall be permanent; easy to read; and securely attached, cast, or stamped onto the unit at a location readily accessible after normal installation. Data plate(s) shall contain the following: — a statement identifying if the unit is suitable for residential supplemental disinfection, supplemental (for all pools and spas) disinfection, or for secondary disinfection, in a minimum 16 pt font: “This unit has been certified to NSF/ANSI/CAN 50 for [disinfection level]”.

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15.8		***New clause added;*** **Disinfection efficacy** Per Section 15.12, residential and supplemental (for all pools and spas) disinfection efficacy testing shall be performed after the system and lamp have accumulated 3,000 hours of operation.
15.8.1		***New clause added;*** Ultraviolet light process equipment designed for residential supplemental disinfection shall demonstrate a 3 log (99.9%) or greater inactivation of influent bacteria when operating at full power and tested according to Section N-8.1 with water having a UVT254 of 94%. Adjustments to UVT shall be made with SuperHume®.
15.8.2		***New clause added;*** Ultraviolet light process equipment designed for supplemental disinfection shall demonstrate a 3 log (99.9%) or greater inactivation of influent bacteria when: – operating at full power and tested according to Section N-8.1 with water having a UVT254 of 94%. Adjustments to UVT shall be made with SuperHume®; and – operating at a reduced power such that intensity observed by the UV intensity sensor matches that observed during the testing in the first part of Section 15.8.2 above and tested according to Section N-8.1 with water having a UVT254 of ≥ 96%. Methods to reduce lamp power for testing may include variable output electronic ballasts, thyristors, pulsewidth modulation control modules, doped quartz sleeves, stainless steel mesh between lamp and quartz, shunt resistors, lamps further aged beyond 3,000 hours, or any other method such that the intensity of light presented to the reactor volume is sufficiently reduced to lower the intensity measured by an un-modified UV intensity sensor to the desired reading.
15.8.4		Ultraviolet light process equipment designed for residential supplemental disinfection shall carry the following information in the installation and use instructions and be noted in the official certification listings: “This unit has demonstrated an ability to provide 3-log inactivation of Pseudomonas aeruginosa and Enterococcus faecium ~~This unit has not demonstrated an ability to provide three log kill or inactivation of <name organisms if applicable>~~. This product is designed for supplementary disinfection and is intended for use with appropriate residual levels of EPA registered disinfecting chemicals. Specific residual levels of EPA registered disinfecting chemicals may be required by the regulatory agency having authority.”

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15.18.2	Additional permitted approach added	**Testing** Products shall be tested to confirm single pass inactivation equivalent to 3 log (99.9%) or greater of C. parvum in accordance with NSF/EPA ETV: Generic Protocol for Development of Test / Quality Assurance Plans for Ultraviolet (UV) Reactors.21 Only full stream testing shall be acceptable, there shall be no partial or side stream treatment testing. The manufacturer of a reactor validated for performance under one of the following protocols shall submit details of the testing for evaluation and validation: — U.S. EPA UV DGM; — U.S. EPA Innovative Approaches for Validation of Ultraviolet Disinfection Reactors for Drinking Water Systems; — DVGW, W-294 Parts 1-3; or — ÖNORM, 5873 1 and 2.1 Validation of a range of reactors with pre-existing test data shall include testing of at least one unit at one set point to evaluate for potential changes in design, suppliers and corroborate previous data.
19	Info	**Automated controllers**
19.1		**New requirement for automated controllers that have been incorporated into a valve** Automated controllers are used to monitor water conditions such as pH, ORP, free chlorine or other parameters specified by the manufacturer and to control equipment such as chemical feeders and pumps. Equipment covered by this section includes the controller and the chemical probes, and flow cells. Water contact components and materials of automated controllers shall be evaluated to the health effects criteria of Section 4. Mechanical chemical feeders are covered in Section 11, and flow-through chemical feeders are covered in Section 12. An automated controller that has been incorporated into a valve shall also comply with the requirements of Section 9.
24	Info	**Flow metering device**
24.11	Does not affect currently listed products	**Display resolution** For linear display scales, the meter display shall be a minimum of 2.00 in (50.8 mm) in linear length. For circular displays, the meter display shall be a minimum of 6.30 in (160 mm) in circumference. There shall be a minimum of ten measurement points displayed on the scale. The minimum distance between the measurement points shall be ~~0.20 in (5.08 mm)~~ 0.10 in (2.54 mm). The scale reading line thickness shall be a minimum of 0.020 in (0.05 cm) thick.

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		For digital displays, the minimum digit height shall be 0.20 in (5.08 mm). The display shall indicate to within 1 GPM or a value equal to at least 10% of the lowest scale reading.
24.14		**Installation and operation manual** A manual shall be provided with each flow metering device and shall include: — instructions for use. Instructions shall include guidance on how to read the device;
26	Info	***Interactive waterplay venue surfacing systems***
26.1	Info	**Clarification of scope** The purpose of this section is to specify the evaluation and testing criteria of surfacing systems other than concrete or asphalt, when used in recreational water facilities. These evaluation and testing requirements will enable the appropriate assessment of a safety surfacing system for interactive waterplay venues. These evaluation and testing requirements pertain only to the surface on grade / ground level.
28		***New section added;*** **Floatation or sensory deprivation systems and related equipment** This section establishes minimum requirements for floatation or sensory deprivation systems and related equipment. These requirements apply to manufactured self-contained and non-self-contained, portable and nonportable systems. Components of a floatation or sensory deprivation system that are supplied by the manufacturer shall comply with the applicable requirements of this standard. See standard for details. Background: Flotation or Sensory Deprivation Systems and Related Equipment were previously included in the spa/hot tub definition but have been broken out into their own section. Any listings for flotation or sensory deprivation systems and related equipment must be re-evaluated to all requirements in the new section.
N-2	Info	**Test methods for the evaluation of filters**
N-2.4	Info	**Filter media cleanability test**
N-2.4.2		**Apparatus** — pressure-recording device (required accuracy is ± 0.5 of the smallest division used in the manufacturer's claimed pressure loss); — turbidimeter (required accuracy from 0 to 10 NTU is ± 0.5 NTU; required accuracy above 10 NTU is ± 5% of the reading or ± 1 NTU, whichever is greater);

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		— temperature-indicating device (required accuracy is ± 2 ˚F [± 1 ˚C]); — flow meter (required accuracy is ± 1 GPM (± 4 LPM) or ± 2% of reading, whichever is greater); — water tank and pump system capable of delivering water at the design flow rate and proper temperature through the filter; and — pressure measurement taps sized to the filter's inlet and outlet. For testing of the cleanability of an alternate sand-type media, the media shall be installed in a 24-in (624-mm) diameter sand-type filter that has previously passed the cleanability test with sand. Regenerative precoat media filters shall be supplied with a means to remove the assembled filter elements and support structure or other agreed upon means to allow for inspection of filter aid retention between the elements and mounting plate.
N-2.4.4		**Method** a) Install and condition the filter in accordance with the manufacturer's instructions. b) Operate the filter at the design flow rate. c) Challenge the unit with the appropriate challenge slurry. Continue to operate diatomite-type, cartridge-type, and membrane-type filters at the design flow rate until the pressure differential across the filter is equal to the manufacturer's recommended pressure differential for cleaning, or until the manufacturer's recommended condition for cleaning is achieved. Continue to operate sand filters until the pressure differential across the filter is equal to the manufacturer's recommended pressure differential for cleaning or 15 psi (103 kPa), whichever is greater. d) Upon reaching the desired pressure differential during the testing of sand filters, slowly reduce the flow to zero, shut down the system, and slowly drain the filter. Sudden reductions in flow can invalidate this test, as the water surge (including reversal of flow) can re-settle the sand bed. Examine the surface of the filter media bed for conformance to Section 6.3. e) Clean the unit per the manufacturer's instructions. Examine the filter media, elements, or cartridges for soil, organics, and filter aid. f) Operate the unit in accordance with the test method in Section N-2.3.4 and determine the head loss at the design flow rate.
N-2.4.5		**Acceptance criteria** The filter media or nonregenerative precoat elements shall be visibly free of soil, organics, and filter aid. Regenerative media precoat elements shall be visibly free of soil and organics with any residual precoat media between adjacent elements near the mounting surface of the elements not exceeding an average 5% depth of the total length of the element, rounded up to the nearest 1/4 in,

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		that extends beyond the mounting surface support plate. For membrane filter systems, the flow at the specified operating pressure shall be at least 81.6% of the flow of the clean membrane flow rate, and not less than the minimum designed flow rate as determined by the manufacturer. The head loss through the filter after cleaning or replacing the filter aid shall not exceed 150% of the initial head loss through the filter as determined in accordance with Section N-2.3.
N-2.9		**Test method for Cryptosporidium parvum oocyst reduction** Systems that are comprised of more than one filter shall have each filter evaluated according to its filter type test method, and a system log reduction may be awarded with consideration given to flow rates and log reduction values of the individual components.
N-2.9.3	Info	**Sand type filters**
N-2.9.3.7		***New clause added;*** **Membrane filtration** Membrane systems shall meet the requirements of NSF/ANSI 419.