Task Group on NSF 385
Straw Ballot
May 17, 2019

Purpose

This straw ballot will affirm the newly drafted standard NSF 385 – Disinfection Mechanics.

Background

The WWT TG on NSF 385 was charged with drafting a Disinfection Mechanics standard after the 2011 Joint Committee meeting. The JC committee authorized the task group to remove the disinfection sections from NSF/ANSI 46 and create a new standard. The revision 5 ballot that was run in July of 2018 drew negative comments, which the Task Group addressed in 3 meetings following the ballot. This ballot was presented to the Joint Committee for approval but received a negative vote regarding geometric means. The Task Group met on 5-7-19 to review and discuss the topic, and the attached r10 ballot is the result of their efforts.

Please note that only the changes from the previously approved r8 ballot are included here for review.

This ballot will last 10 days.

The grey highlighted portions of the language are proposed additions to the language of the standard.
The ~~strikeout~~ portions of the language are proposed deletions to the language of the standard.

An affirmative (yes) vote on this straw ballot means you agree with the revised language as submitted.

A negative (no) vote on this straw ballot means you disagree with the revised language as submitted. A negative vote must include an explanation of why you disagree with the revised draft.

NSF/ANSI Standard
For Wastewater Technology –

Disinfection Mechanics

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1.4 Influent water characteristics

Test data collected on days when the influent water pH and temperature are out of compliance with this section shall be excluded from the results. Any results from days where $CBOD_5$, TSS, fecal coliform, E. coli, or ammonia influent concentration is less than shown in the table below shall be excluded. Any results from days where UV transmittance is greater than 75% shall be excluded. The certifier shall report results obtained when other influent concentrations exceed the maximum values in the table below for the influent water. Influent water for the biological deactivation testing shall be secondary treated residential wastewater meeting the criteria as shown in Table 1.1

At the manufacturer's discretion, any data collected on days when the influent $CBOD_5$, TSS, fecal coliform, E. coli, or ammonia concentrations exceed the maximum limits set in table 1.4, may be replaced with data collected from additional sample days for the purpose of determining pass or fail. At the manufacturer's discretion, any data collected on days when the influent UV transmittance is less than 50%, may be replaced with data collected from additional sample days for the purpose of determining pass or fail.

Table 1.1 - Influent characteristics

$CBOD_5$	≥ 10 and ≤ 25 mg/L
TSS	≥ 10 and ≤ 30 mg/L
E. coli	10^2 – 10^6 cfu/100 mL
fecal coliform	10^4 to 10^8 organisms/100 mL
pH	6.0 to 9.0
temperature	6 °C to 30 °C (42 °F to 86 °F)
ammonia	≥ 2.0 and ≤ 4.0 mg/L
UV transmittance of influent	50 to 75% per cm

~~NOTE —~~ UV transmittance values in Table 1.1 are for traditional aerobic treatment units. Influent parameters in Table 1.1 shall be measured every time an effluent sample is collected, and corresponding values reported. Ammonia need not be tested for UV technologies and UV transmittance of influent need not be tested for any technology except UV. If the manufacturer is testing for only E. coli or fecal coliform as allowed in Section 1.5, then the influent E. coli or fecal coliform not required in the effluent monitoring need not be collected.

Temperature, pH, Influent fecal coliform, and E. coli shall be based on grab samples collected. Influent water characteristics for all other parameters shall be based on 24-hour composite samples collected. During maximum and, if required, minimum flow testing, the influent samples shall be collected during the

time while dosing is active.

1.5 Effluent criteria

1.5.1 30-day effluent geometric mean

The 30-day geometric mean of all required samples of effluent quality for each 30-day sampling period shall meet one or both of the following criteria, as chosen by the manufacturer:

- fecal coliform ≤ 200 organisms/100 mL; or
- E. coli ≤ 126 organisms/100 mL.

1.5.2 Individual sample maximum values

No more than 10% of all required samples of effluent quality over the entire sampling period shall meet one or both of the following criteria, as chosen by the manufacturer:

- fecal coliform ≤ 800 organisms/100 mL; or
- E. coli ≤ 410 organisms/100 mL

The final report will provide information on the log reduction for fecal coliform or E. coli based on which one is used as the indicator for disinfection.

Failure to meet the above criteria shall be a failure to conform to this Standard. Failure to meet the criteria of NSF/ANSI 350 shall be a failure to conform to that Standard if such was requested. Failure under NSF/ANSI 350 does not preclude conformance under this Standard if the above criteria are met. Additional parameters may be collected and analyzed at the request of the manufacturer.

All samples shall be refrigerated according to *Standard Methods* if not tested within 1 hour of collection.

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6 Chlorine disinfection devices

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6.5.2.2 Life test microbiological sampling

Extreme care shall be taken in designing a sampling program and sample site for chlorine disinfected water. The sample point shall be immediately adjacent to the outlet flow of the chlorine disinfection device contact chamber. Sterile samples bottles and sterile sample collection techniques shall be used during sample collection.

Microbiological organism samples shall be collected and analyzed three times per week over 30 days. Grab samples shall be collected at least 30 minutes after the start of the loading period for gravity chlorine disinfection devices. Samples shall be rotated in order of the loading periods per 6.5.2.1 so that one third of the samples shall be collected in each of the loading periods (6.5.2.1) for gravity chlorine disinfection devices. Samples shall be collected during times of system discharge for pump dependent chlorine disinfection devices. When the pump is activated by floats, sample collection shall be rotated as close to the 3 different dosing periods as possible. When pumped discharge is based on a timer, samples are collected only during each discharge event, rotating between 5%, 50%, and 95% into the timed pump cycle.

At the three tests per week ratio, each loading period shall have a minimum of five samples (the final week contains only two days, but three samples shall be collected during that week).

NOTE — The manufacturer may request additional samples per week complying with the above.

Sample containers shall contain disinfection neutralizer sufficient to halt the disinfecting action. Samples shall be refrigerated if not analyzed within one hour of collection. Analysis shall be performed within 6 hours of sample collection.

When samples are lost or invalidated, they shall be replaced with additional sampling during the following week or additional weeks may be added to the life test until a minimum of 15 samples have been successfully analyzed.

6.5.2.3 Criteria

The geometric mean of microbiological organism concentration from all grab samples collected and analyzed under 6.5.2.2 shall meet the pass/fail criteria in 1.5.1.

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6.5.3.1.2 Fixed feed rate devices

The manufacturer shall specify the maximum and minimum wastewater flow capacity and flow rate, if required, for the chlorine disinfection device. Flow shall be introduced continuously or in evenly spaced doses not exceeding 38 L (10 gal) and the maximum flow rate through the treatment system feeding the test chlorine disinfection device. Fixed feed chlorine disinfection devices shall be tested over 3 dosing periods described in the table below.

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6.5.3.1.5 Criteria

At the conclusion of the test, there shall be no visible signs of damage or structural change that adversely affect proper operation of any components of the chlorine disinfection device. The evaluation shall be performed following completion of the microbiological organism deactivation test, as specified in 6.5.3.

The geometric mean of microbiological organism concentration from all grab samples collected and analyzed under 6.5.3.1.4 shall meet the pass/fail criteria in 1.5.1. This is not a true 30-day geometric mean, as these samples are collected over a much shorter period of time, but the pass/fail criteria still apply. No more than 2 samples collected under 6.5.2 and 6.5.3 combined shall exceed the maximum values in 1.5.2.

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7 Ultraviolet (UV) disinfection devices

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7.6 Performance testing and evaluation

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7.6.1.3 Microbiological organism deactivation test

Extreme care shall be taken in designing a sampling program and sample site for UV disinfected water. Since no residual remains when the sample is removed from the UV light exposure, re-growth of organisms and contamination of samples in a testing environment is possible. The sample point shall be immediately adjacent to the outlet flow of the UV disinfection device. Sterile sample bottles and sterile sample collection techniques shall be used during sample collection.

Microbiological organism values shall be collected twice per week where one grab sample is collected beginning 30 minutes after the start of the hydraulic loading period. Samples shall be rotated in order of the hydraulic loading periods per 7.6.1.2 so that one third of the samples shall be in each of the hydraulic loading periods (7.6.1.2). At the two tests per week ratio, each hydraulic loading period shall have a minimum of 17 samples. When this minimum number of samples is not met, additional sampling may be added or the test may be extended until the requirement is met.

NOTE — The manufacturer may request additional samples per week complying with the above.

Samples shall be refrigerated if not analyzed within one hour of collection. Analysis shall be performed within 6 hours of sample collection.

7.6.2 Criteria

The ~~geometric mean of~~ microbiological organism concentration from all grab samples collected during the ~~first 13 weeks of the life test shall meet the pass/fail criteria in 1.5. The geometric mean of microbiological organism concentration from all grab samples collected in the final 13 weeks of the~~ life test shall meet the pass/fail criteria in 1.5.

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8 Ozone disinfection devices

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8.6 Performance testing and evaluation

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8.6.1.2 Microbiological organism deactivation test

Extreme care shall be taken in designing a sampling program and sample site for ozone disinfected water. Since no residual remains when the sample is removed from the ozone exposure, re-growth of organisms and contamination of samples in a testing environment is possible. The sample point shall be immediately adjacent to the outlet flow of the ozone disinfection device contact chamber. Sterile sample bottles and sterile sample collection techniques shall be used during sample collection.

Two microbiological organism samples shall be collected and analyzed per week over 26 weeks. Grab samples shall be collected at least 30 minutes after the start of the loading period. Samples shall be rotated in order of the loading periods per 8.6.1.1 so that one third of the samples shall be collected in each of the loading periods (8.6.1.1). At the two tests per week ratio, each loading period shall have a minimum of 17 samples. When this minimum number of samples is not met, additional sampling may be added or the test may be extended until the requirement is met.

NOTE — The manufacturer may request additional samples per week complying with the above.

Samples shall be refrigerated if not analyzed within one hour of collection. Analysis shall be performed within 6 hours of sample collection.

8.6.1.3 Criteria

The ~~geometric mean of~~ microbiological organism concentration from all grab samples collected and analyzed under 8.6.1.2 shall meet the pass/fail criteria in 1.5.

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