Joint Committee Issue Paper

NSF Standard(s) Impacted: NSF/ANSI 50

Background:

Several manufacturers have approached NSF International requesting to have their polymer fiber filtration media tested and certified. These media, which resemble soft fuzzy spheres 1-4 inches in diameter, are intended to function as a sand replacement media. NSF Laboratories have developed a testing procedure to validate the claims of performance equivalency with sand media, as well as establish product longevity in a chlorinated environment.

These products exist in the market place and are marketed to both residential and commercial pool operators and owners. It benefits pool owners and users to have methodology to distinguish between effective filtration media products and ineffective products.

NSF requests the committee to review this test protocol and ballot it into NSF/ANSI 50.

Recommendation:

12.3 Polymer Fiber Filtration Media

Polymer fiber filter media shall conform to the requirements of Section 3 on NSF/ANSI 50. Polymer fiber filter media shall be evaluated for use in sand filters.

12.3.1 Initial Media Integrity Test

Prior to evaluation for head loss, turbidity reduction, cleanability or longevity, the media shall not lose more than 1% by mass when the media is installed into a representative sand-type filter and conditioned in accordance with the manufacturer's instructions, and the filter is subjected to the following sequence:

1. Plumb both the filtrate and waste ports of the test filter multiport valve or manifold to return to a clean test tank (<2.0 NTU)
2. Plumb the supply port of the test filter multiport valve or manifold to the effluent of a centrifugal pump that is connected to the same clean test tank
3. Adjust the filter valve(s) to filter mode, introduce flow to the filter at the maximum design flow rate over a period of 10 seconds, and maintain the maximum design flow rate for 3 minutes
4. Reduce flow to the filter to zero over a period of 5 seconds
5. Adjust the filter valve(s) to backwash mode, and introduce flow to the filter at the maximum design backwash flow over a period of 10 seconds, and maintain this flow for 3 minutes
6. Reduce flow to the filter to zero over a period of 5 seconds
7. Repeat steps 3-6 nineteen additional times to complete 20 complete filter/backwash cycles
8. Determine the mass of filter media lost via gravimetric analysis of the media itself or by gravimetric analysis of a bag type filter which all backwash and filter mode effluents have passed prior to returning to the test tank.
   a. Before and after the integrity test, dry the media and/or the bag type filter in a convection oven at 140±5°F to a constant mass.
   b. Determine the amount of media lost by the following equation:

$$\%\ Mass\ Loss\ = \left[1 - \frac{w_2}{w_1}\right] \times 100\%$$

Where w_1 is the initial mass of the polymer fiber filter media and w_2 is the final mass of the polymer fiber filter media

12.3.2 Initial Head Loss

When tested in a representative sand-type filter, the head loss through the filter operating at the designed flow rate shall not exceed the filter manufacturer's maximum designed head loss when determined in accordance with Annex B, section B.3.

12.3.3 Initial Turbidity reduction

When tested in a representative sand-type filter, the media shall reduce water turbidity by 70% or more when tested in accordance with Annex B, section B.5.

12.3.4 Initial Cleaning of filter media

The cleaning of filter media in accordance with the manufacturer's instructions shall render the filter media free of visible dirt and debris. 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. Testing shall be conducted in accordance with Annex B, section B.4.

12.3.5 Longevity Test

For polymer fiber filtration media designed to be used for more than one filter/backwash cycle: after performing five complete soiling and cleaning cycles as defined in Annex B, Section B.4, the filter media shall be tested for continued conformance to the head loss, turbidity reduction and cleanability requirements of the test standard.

12.3.6 Filter media behavior

If the cleaning method of the media includes backwashing, then the filter media shall meet the requirements of 5.3.5 and the testing shall be conducted in accordance with Annex B, section B.4.

13.3.7 Filtration and backwash rates

The design filtration rate of sand-type filters shall conform to the limits specified in Section 5.3.9.

12.3.8 Chemical Resistance

For polymer fiber filtration media designed for more than one filter/backwash cycle: Materials of construction shall have a demonstrated resistance to deterioration or degradation in the presence of chlorine levels up to 10 mg/L, and pH levels between 6 and 8. If pre-existing data cannot be provided, media shall not show signs of degradation or deterioration after exposure to the following:

1. 24±1 hours of exposure to water having 10±2 mg/L FAC, pH 6.0±0.5, temperature 102±5°F
2. 48±24 hours of exposure to water having 2±1mg/L FAC, pH 7.0±0.5, temperature 102±5°F
3. 24±1 hours of exposure to water having 10±2 mg/L FAC, pH 8.0±0.5, temperature 102±5°F
4. 48±24 hours of exposure to water having 2±1mg/L FAC, pH 7.0±0.5, temperature 102±5°F
5. Repeat steps 1 through 4, four additional times

12.3.9 Installation and operating instructions

The manufacturer of Polymer fiber filtration media shall provide written instructions for the installation of the media in a filter, including requirements for a different support media, for the volumetric or weight equivalent media amount to sand, for any specific preparation of the media for operation, and for the operation of filter with the media.

12.3.10 Labeling requirements

Polymer fiber filtration media shall contain the following information on the product packaging or documentation shipped with the product:

- manufacturer's name and contact information (address, phone number, website, or prime supplier);
- product identification (product type, and trade name);
- net weight or net volume;
- when applicable, mesh or sieve size;
- lot number or other production identifier such as a date code;
- when appropriate, special handling, storage and use instructions; and
- the specific certification mark of the certifying organization for certified products.

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