

*As a consumer and a father of young children, I find myself amazed at the products that enter our market that could be potentially unsafe for use in our homes. In early February, we received a call from a bulk food store we often purchase from. The person on the phone said their records indicated that we purchased granola bars that are part of the recent recall for a Salmonella outbreak.*

By Mark Unger

## Is that Safe?



POE materials safety testing

While it was nice to receive this warning, our granola bars were consumed well before we received that call. Based on the fact that everyone in my household is doing well it appears as though our bars were safe, but it still makes you wonder. From lead paint on toys to Biphenyl-A in baby products to *Salmonella* in the food we consume, it is easy to question the safety of the products we purchase. Whether you are a manufacturer, dealer or OEM of water treatment products, providing safe products to your customers should be your top concern.

### Safety Test

Material safety testing is an excellent way to ensure the products you provide are safe for contact with drinking water. The safety of point-of-use (POU) drinking water treatment units are covered by the NSF/ANSI Drinking Water Treatment Unit Standards (42, 44, 53, 55, 58 and 62), water treatment chemicals are covered in NSF/ANSI Standard 60 and water treatment components—essentially anything that comes in contact with drinking water—are covered in NSF/ANSI Standard 61. The NSF/ANSI 61 standard covers many different types of products, but our focus for this discussion will be point-of-entry (POE) drinking water treatment units such as water softeners, whole-house filters and their components.

To begin the material safety process, a wetted parts list for POE systems and components is created by the manufacturer and submitted to the product certification body (WQA, NSF, CSA and UL). The wetted parts list is a breakdown of the system that shows each component that comes in contact with drinking water when the product is used. The wetted parts list contains useful information such as the material(s) each part is made from, where each component is made and the wetted surface area of each component. The wetted parts list and other material formulation information is reviewed by a toxicologist to determine the scope of testing required based on the material formulation of each of the

wetted components.

The scope of testing typically entails metals and organic testing of the water collected from the POE system during testing. Testing for leachable metals is conducted using two different pH exposure waters (pH 5 and pH 10) to ensure no metals leach from the product or component. Testing for organic contaminants is conducted using pH 8 exposure water; therefore, a material safety test for one POE product or component is really a three-part test process using each pH exposure water. The number of systems required to conduct testing, however, can be greater than three if the system has a holding volume of less than 2 liters (L) or if the system contains adsorptive (e.g., activated carbon) or absorptive media (e.g., ferric oxide). NSF/ANSI Standard 61 requires at least 2 L of exposure water for material safety testing and also requires that products containing adsorptive or absorptive media be tested with and without this media. Once a project is initiated, the product certification body will determine the number of systems needed for testing.

### Testing Procedures

The material safety test for POE systems and components consists of a conditioning period followed by an exposure period when samples are collected and analyzed to determine the concentrations of extractable contaminants. The first part of conditioning involves installing and flushing the units with exposure water according to the manufacturer's instructions at an inlet pressure of 50 psi. The manufacturer or supplier may then choose the conditioning period for their product, which can be as short as one day and as long as 14 days.

A 14-day conditioning period is most common and requires at least 10 water changes (or fewer if specified by the manufacturer) with a minimum of 24 hours of conditioning in between water changes. A test system, for example, would be installed and flushed, filled with exposure water, held for 24 hours, then drained and refilled the next day. This procedure is repeated every

day for two weeks, but could remain untouched for 72 hours over the weekend (depending on the test laboratory's working schedule).

After the 14<sup>th</sup> day of conditioning, the exposure period begins. At this point, the pH 8 exposure water used for organics extraction must be chlorine-free for the exposure period. NSF/ANSI Standard 61 allows a manufacturer the choice of two optional exposure days on days 15 and 16 before the final water sample is collected on day 17. Systems with adsorptive or absorptive media, however, must partake in all three exposure days. Water samples are collected after each of the three exposure days and combined for analysis.

All water evaluated for POE materials safety is compared to the maximum contaminant levels (MCLs) and maximum allowable concentrations (MACs). In order for a product to meet the requirements of NSF/ANSI Standard 61, the results section for a POE system or component in each type of exposure water must meet the requirements of the standard.

The materials extraction test for POE systems and components may seem tedious and over the top, but it helps to ensure that these products do not compromise public health and safety. The certification of these products combines materials extraction test data with annual audits of manufacturing facilities to ensure the products that are manufactured are the same that have been tested. Material and supplier changes to previously tested products typically require additional testing to ensure these products remain safe for contact with drinking water. If you realize the importance of providing your customers with safe products, then you should certify your POE systems and components to NSF/ANSI Standard 61, Section 8. *wqp*

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