

Is time running out? In the certification world, TIC has a completely different meaning. What exactly is a tentatively identified compound (TIC), and what does this mean for you?

By Tina Fischer

In the past, the detection of TICs extracted from drinking water treatment components and units was relatively uncommon. Advancements in technology and accuracy of instrumentation, however, have increased the sensitivity for detecting more compounds in test samples. Additionally, the recent rush to take manufacturing abroad has also led to a significant increase in the amount of TICs being detected.

in these scans; however, the scans also provide results for compounds that are not on the NSF/ANSI lists, and these are referred to as tentatively identified or unknown compounds.

In order to identify the compounds, their results are compared against results for hundreds of thousands of known compounds contained in databases. If the unidentified compound matches a known compound with high certainty,

In order to establish safe levels, toxicologists perform exhaustive research regarding a TIC's chemical structure and its similarity to chemicals that have been evaluated for human exposure. Numerous articles and studies are accessed and compared, and then logical, qualitative assessments are made regarding the historical studies. From there, the toxicologist will make a recommendation regarding what concentration of the TIC would be safe for human consumption. If the TIC concentration from the product is below the safe level set by the toxicologist, the product will meet the requirements of the standard. If the concentration of the TIC is above the safe level, the product will require modification and retesting.

Certainly questions may be raised regarding the accuracy of the toxicologist and what allows any given toxicologist to make these kinds of evaluations and decisions. Each year, a peer review panel meets to discuss the work of fellow toxicologists to ensure accuracy and continued dedication to public health. In essence, the toxicologist's work is reviewed to provide assurance that the work being completed is accurate.

TIC, TIC, TIC

TIC is the dreaded outcome from extraction testing. Of course, while no one likes to hear that their product extracts any TICs, at least now you know that just because there is a TIC, it does not automatically mean you have failed the testing. It simply means that a qualified toxicologist will become involved and take the needed step of protecting public health. With the expertise of toxicologists in the industry, TICs can be considered just another step toward certification as opposed to a stumbling block. *wqp*

Author's Note: The procedures noted in this article may not represent the precise process each certification agency uses when TICs are detected. These procedures accurately reflect the procedures used by the Water Quality Association (WQA). Currently, Thomas Palkon, director of product certification for the WQA, is chairing a committee to work with all certification agencies and public health officials to come up with a single procedure for all certification agencies to use regarding TIC extractants.

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tic, tic, tic . . .

If you have gone through NSF/ANSI standard certification, you undoubtedly have heard the acronym TIC.

Extraction Testing

When a product is undergoing the rigorous testing to meet the NSF/ANSI standards, extraction testing is required. The extraction testing protocol varies in length as well as type of water used to conduct the test based on a couple different factors.

The type of product that is being certified as well as the standard to which the product, component or chemical is being certified will dictate the precise protocol to be followed for extraction testing; however, the general concept that all extraction tests follow, regardless of product or standard type, remains the same. An extraction test quite simply can be described as the soaking of a product in water and analyzing the extraction water to ensure that the product itself does not introduce any harmful contaminants into the water.

When the chemical analysis is conducted, precision instruments such as a gas chromatograph and mass spectrometer are used to perform analysis of compounds in the test samples. While an initial toxicology review dictates analysis of some specific compounds based on the product composition, much of the chemical analysis is conducted by performing a general scan of regulated chemicals. For example, a volatile organic compound (VOC) scan is employed to target hundreds of thousands of organic compounds.

The NSF/ANSI standards include lists of acceptable levels for many of the chemicals that are evaluated with-

then the compound is tentatively identified as that known compound. If a match cannot be determined through this search, then the unidentified compound is classified as an unknown.

Once you understand where these TICs may evolve from, it is very easy to understand the reason you may see them on your extraction test reports. TICs can be detected from the materials the product is made out of—from artifacts that remain after shipment to the lotion used on a line worker's hands when putting together a product—or even from the cleaning supplies used when the factories clean their equipment. The extraction water analysis is typically being reported to parts per billion and even parts per trillion. While these levels seem insignificant, it is imperative to understand that carcinogenic compounds have the ability to cause harmful effects even at levels this low.

When You Have TICs

So what happens when TICs have been extracted from your unit? The first step is for the analytical laboratory to ensure that the TICs reported are accurate. Because TICs are tentatively identified, the analytical chemists must verify that the compounds are matched to a known compound with a high level of certainty. Once certainty has been determined, the TICs must undergo evaluation by a qualified toxicologist to determine if a safe level can be established for the TIC.

While some TICs are listed in the NSF/ANSI standards for comparison, many of the TICs are not listed and require scrutiny to verify how much of the compound is safe for human consumption.

What the detection of TICs in drinking water means for you

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