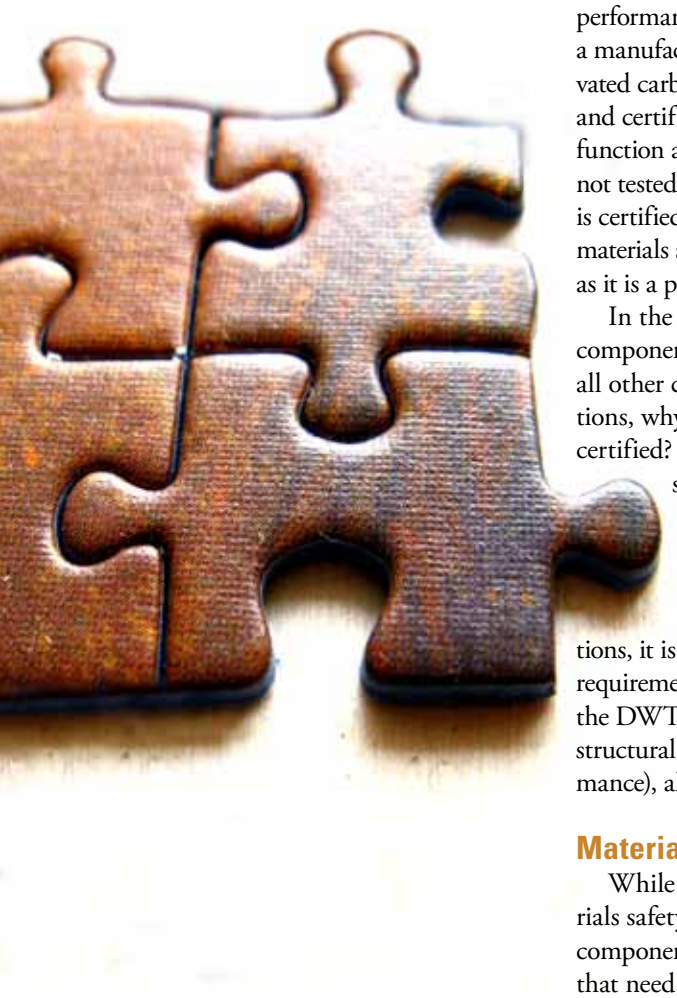
# Piecing Together Certification

By Brian Donda

Individual component certifications can be useful when certifying systems



Certification may seem complicated, but once it is broken down into digestible pieces, it becomes simple. There are many drinking water treatment unit (DWTU) standards, each focusing on a specific technology. NSF/ANSI Standard 42, the focus of this discussion, provides protocols and requirements for water filter certification.

A confusing aspect of certification is the reasoning behind certifying a system composed of already certified components. It is often assumed that combining certified components implies certification for the system. In reality, multiple component certifications do not equal a complete system certification.

Standards allow components to maintain individual certifications for materials safety and/or structural integrity only, but they cannot be certified for performance claims. For example, when a manufacturer chooses to certify an activated carbon filter cartridge, it is tested and certified for materials safety only. Its function and performance capabilities are not tested. Consequently, when a housing is certified as a component, it is tested for materials safety and structural integrity, as it is a pressure-bearing component.

In the example above, two system components underwent certification. If all other components also have certifications, why is the system as a whole not certified? Why would a manufacturer spend the time and money to obtain component certifications if they are not transferable to customers?

In order to answer these questions, it is best to break the certification requirements into the four sections of the DWTU standards (materials safety, structural integrity, literature and performance), along with facility inspection.

## Materials Safety

While it is possible to obtain materials safety certification using individual component certifications, there are steps that need to be taken first. Because the components were tested separately, the results from each extraction test must be combined to ensure that the totals will not elicit any contaminants extracting at concentrations above allowable limits.

For example, if a manufacturer uses four certified components in a system, and each extracts 5 ppb of lead, then individually they all meet the 15-ppb requirement. When combined, however, the lead concentration would be 20 ppb, exceeding the allowable limit.

Furthermore, it is important to ensure that the surface-area-to-volume ratios of the components are worst-case when compared with the ratio of the components in the system. If no contaminants are above allowable levels and the surface-area-to-volume ratios of the tested unit are worst-case, then the original test data may be used to verify a system's materials safety. The manufacturer would not need to perform additional extraction tests, saving thousands of dollars.

## Structural Integrity

It also is possible to obtain structural integrity certification using certified components' test data—but it is not possible to simply transfer that data to the system. It is important to ensure that the cycles and pressures at which components were tested are equivalent to or more stringent than the pressure the system must undergo. Usually, when a component is tested for structural integrity, the data are worst-case and are transferable for system certification.

## Literature

All certification requires literature compliance, but requirements vary for components and systems. Because components are certified for materials safety and/or structural integrity only, requirements are minimal. Depending on the product type, just a label may be needed. However, systems are required to have many pieces of literature, including installation/operation manual, performance data sheet, data label and for filters, replacement component literature.

System literature is more diverse and includes specifications on end product performance. Regardless, there are literature requirements for both types of certification, and it must be reviewed and approved by the certification agency.

## Performance

Component certifications cannot be used to obtain system certification for performance. Although cartridge manufacturers often conduct performance testing, it is not certifiable. There are several reasons for this. First, changes to flow rate and bypass may occur when a cartridge is placed in a system. A system's flow rate affects how a cartridge reduces contaminants. Therefore, any flow rate changes that could reduce performance would nullify the certification. Second, when a cartridge is placed in a system, there is concern about seals and whether or not contaminants can bypass the filter.

The time and money manufacturers spend on checking performance for components are not lost, however. Certification agencies can perform tests for seal and flow verification. If they determine that specifications are within allowable ranges, the data may be used for certification without full testing for each contaminant.

## Facility Inspection

Facility inspection is the most important part of certification. It is impractical for any manufacturer to test every single product with a third-party listing agency. Therefore, a facility inspection is required to ensure that each product is manufactured in the same manner.

If a component is certified, its manufacturer will be audited. However, confirming that each component was manufactured consistently does not ensure that the system is being manufactured consistently. By using an accredited certification agency for system certification, production processes are reviewed, resulting in valid certification.

While on the surface there seems to be a good argument for assuming system certification can be granted if all components are certified, there are other steps to consider. Combining certified components provides a system manufacturer with some assurance that it will meet requirements. Combining certified components does not authorize advertisement of a certified system. This discussion focused on just one technology, but the basic concepts are the same for all treatment technologies. *wqp*

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