

PVC PIPE *news*



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The PVC pipe industry has been a long-standing leader in offering an engineered material that is certified by an independent agency as safe for the transport of drinking water.

This effort dates back to 1951, when the thermoplastic pipe industry began working with the National Sanitation Foundation (NSF) in the development of a listing and testing service provided by an independent laboratory. This certifier would ascertain whether or not various plastic pipe products were properly

manufactured and met applicable standards. If the product did, the independent laboratory would provide certification to that effect. In 1959, NSF began to test and certify plastic pipe for potable water service.

STANDARDS

From the late 1950s to the early 1970s, a variety of organizations wrote standards for PVC pipe. The federal government was involved. The US Department of Commerce (Commercial Standards and Public Standards) and the US Department of Housing and Urban Development published PVC pipe standards. ASTM



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Subcommittee D20.17 on Thermoplastic Pipe and Fittings also wrote PVC pipe standards. ASTM F17 Committee on Plastic Piping Systems grew out of the ASTM D20.17 Subcommittee and became a full committee in its own right in 1973.

STANDARD 61 REFERENCES THE MAXIMUM CONTAMINANT LEVELS (MCL) SET BY THE US EPA. WHEN PRODUCTS ARE TESTED IN ACCORDANCE WITH THE PROTOCOL DETAILED IN THE STANDARD, REGULATE4D SUBSTANCES CANNOT EXCEED TEN PERCENT OF THE US EPA MCL.

Likewise, the writing of drinking water standards has involved different groups from both the public and private sectors. In 1962, Congress established drinking water standards under the Public Health Service. Then in 1965, and thereafter, the plastic piping industry participated in a voluntary program to evaluate its products for health effects with the NSF through NSF Standard 14, "Plastic Piping Components and Related Materials." In 1984, the federal government announced that it wanted to terminate its direct sponsorship of the program and voiced its desire to establish a private sector program run by a non-profit organization. The program was awarded to a consortium of organizations in 1985 that was composed of NSF, the AWWA Research Foundation, the Association of State Drinking Water Administrators, and the Conference of State Health Managers. In 1988, Standard 60, "Drinking Water Treatment Chemicals – Health Effects," and Standard 61, "Drinking Water System Components – Health Effects," were published for direct and indirect additives. These new standards updated and replaced the health effects requirements of NSF Standard 14 and were adopted by the American National Standards Institute (ANSI). The ANSI/NSF Standards are applicable not only to plastic piping components, but to all water distribution and plumbing components that come in contact with drinking water.

It is worth noting that when NSF Standard 61 was originally adopted, NSF already had more than twenty years of experience testing PVC water pipe and fittings. NSF Standard 61 requirements are based on health effects as they relate to the consumer getting drinking water from the tap and address two specific concerns:

- Do any contaminants leach or migrate from the product into the drinking water?
- If so, is the level of migration acceptable from a public health and toxicological viewpoint?

Plastic pipe and fittings are evaluated under Section 4, "Pipes and Related Products," of Standard 61. The manufacturer must provide NSF with information on the size and intended use of the product and information on the material formulation and ingredients used in the product's water contact surfaces. NSF keeps the formulation information provided confidential. NSF reviews the raw materials and ingredients to determine sources of potential contaminants and for developing a specific testing regime. NSF then conducts the tests, analyzes the results, and makes a final toxicological assessment.



The Evolution of the NSF Mark



REGULATIONS

Because it is not practical for public health agencies, water utilities, or consumer groups to evaluate the hundreds of health and environmentally related products and materials, they typically depend on the NSF mark and certification as evidence of the product's safety. The NSF certification process (Figure 1) for plastic pipe and fittings is as follows:

- A company applies to have its products certified and provides information on the sizes, styles, and uses of the products.
- The material formulators and ingredient suppliers provide formulation, processing, and manufacturing information on each material directly to NSF.
- NSF conducts a preliminary toxicology review by examining every ingredient and material.
- NSF schedules an initial audit at the manufacturing plant. Subsequent audits by NSF (up to three a year) are unannounced.
- The NSF representative selects a product sample and ships it to NSF's laboratories for testing.
- NSF's laboratories test the samples by exposing the samples to formulated waters and then analyzing the exposed water for chemical contaminants that were identified in the initial toxicological review.
- The NSF laboratory results are normalized using standard protocols to determine the "at the tap" contaminant concentrations.
- For contaminants regulated by the EPA, the normalized concentrations are compared with Single Product Allowable Concentrations (SPAC) or Total Allowable Concentrations (TAC) which are based on EPA's Maximum Contaminant Levels. The SPAC is generally one tenth of the EPA MCL to account for multiple sources of the same contaminant. This approach is used for pipe products 4-inches in diameter and larger. Smaller diameter products are evaluated in another manner.
- For unregulated contaminants, the SPAC and TAC are developed based on a review of toxicology data as outlined in Annex A of Standard 61.

Potability tests simulate the commissioning of a water line. The specimens are flushed and disinfected, after which the cumulative amount of trace materials are tracked. The contaminants tracked were the ones the identified in the toxicological review of the raw materials used to make the pipe or fitting.

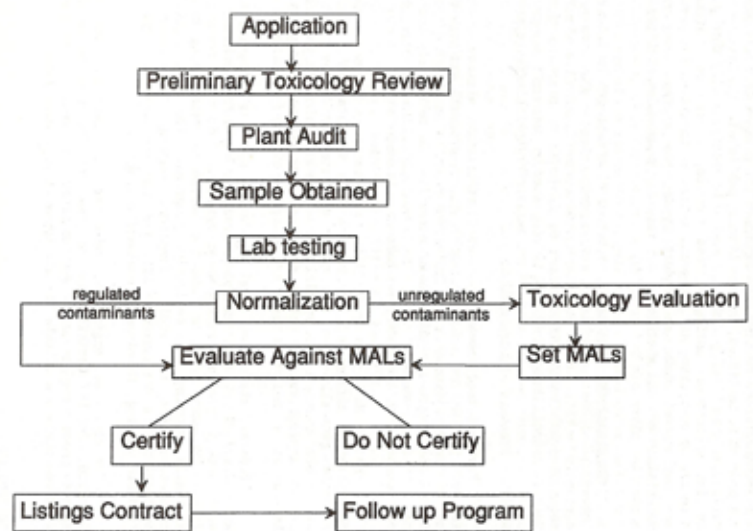


Figure 1, the NSF certification process

CERTIFICATION

Once all the requirements of the standard are satisfied, and once all the technical requirements have been met, and once a contract has been executed, then and only then is a product considered by NSF to be certified. Once certified, the listing of that product is published. The listing appears periodically in listing books, is available electronically through NSF's on-line electronic listings access service, and can be confirmed directly by contacting NSF. NSF's follow-up certification procedures are based on product type, the types of materials used, and whether or not they are compounded or modified at the production plant.

It is important to note that PVC pressure pipe standards mandate drinking water testing no less strict than NSF 61. Other water piping standards do not! However, some states make up for that oversight by requiring NSF 61 certification. To check whether or not your state requires potable water certification, visit the following NSF web link:

http://www.nsf.org/business/water_distribution/pdf/ASDWA_Survey_2006.pdf

If your state does not mandate such certification, you might want to add this requirement to your specifications.