

# PVC PIPE ASSOCIATION TECHNICAL BRIEF

## PVC WATER AND SEWER PIPE: LEAD-FREE

Lead-poisoning from old service-line piping is a critical water-industry concern. This raises the question: can lead leach from PVC pipe?

### PVC PIPE INGREDIENTS AND MANUFACTURING – NO LEAD

The ingredients used in North American PVC pipe do not contain any lead whatsoever:

1. PVC resin – the primary ingredient in PVC pipe – for water pipe, it accounts for more than 90% of the material by weight
2. Modulus enhancer – CaCO<sub>3</sub> – calcium carbonate increases the material's modulus of elasticity – about 5%± by weight
3. Micro-ingredients – in total, these ingredients constitute less than 2% of the pipe material's weight:
  - (a) UV inhibitor – titanium dioxide (TiO<sub>2</sub>)
  - (b) Lubricants – to facilitate the manufacturing process
  - (c) Stabilizers – to ensure that the pipe material does not degrade during manufacturing

In addition, the manufacturing equipment and processes used to produce PVC pipe do not contain any sources of lead.

### WATER-QUALITY TESTING PROGRAMS

The North American PVC pipe industry has always considered it essential to ensure that PVC pipes were safe for drinking water. In the early 1960s, the industry began working with the National Sanitation Foundation (NSF) to develop testing programs. The result is more than fifty years of water-quality testing of PVC pipe. Testing programs and standards have evolved over the years:

- 1965: NSF Standard 14 “Plastics Piping System Components and Related Materials” – as the title indicates, this standard covered only plastics.
- 1987: NSF Standard 61 “Drinking Water System Components - Health Effects” – this standard expanded Standard 14's plastic-pipe water-quality testing program to include all materials in contact with drinking water.

It is important to note that NSF Standards 14 and 61 have identical requirements for water-quality testing of plastic pipes.

### PVC PIPE AND FITTINGS UNDERGO RIGOROUS WATER-QUALITY TESTING

In January 2011 a letter written by NSF explained the testing program for PVC pipe and fittings. The program includes:

1. Analysis of pipe materials for potential contaminants
2. Testing of pipe products
3. Toxicology evaluation
4. Unannounced audits of manufacturing facilities
  - a. Verification that there has been no change to materials or processes
  - b. Collection of samples for annual re-testing

This rigorous evaluation and testing regimen ensures that PVC pipe and fittings have been and will continue to be safe for drinking-water applications. Note that the first bullet in the second-last paragraph says: “Lead: PVC pipe and fittings certified by NSF do not contain lead.” [Click here](#) for letter.

### NO SURPRISE – LEAD NOT FOUND IN WATER IN PVC PIPE

The findings from 50+ years of testing should come as no surprise – since there is no lead in PVC pipe's raw materials and manufacturing processes, lead contamination is not present in the PVC pipe or in the extractant water tested.

References: “Health Effects Monitoring of PVC Pipe and Fittings,” J. Brown; Standard 14 “Plastics Piping System Components and Related Materials,” NSF International; Standard 61 “Drinking Water System Components - Health Effects,” NSF International