



# Fittings U.S. Strives to Become 'Land of the Lead Free'

Last December, politicians and industry experts anticipated new legislation that would make the “Land of the Free” also the “Land of the Lead Free” pending a single but very important signature.

Of course we now know that, in January of this year, President Obama signed the “Reduction of Lead in Drinking Water Act” (or Senate Bill S.3874) which set a new, federal standard for the level of permissible lead in plumbing fixtures that carry water for human consumption. With a stroke of the presidential pen, the Land of the Lead Free begins in just three short years.

By 2014, the allowable lead content in products providing water for human consumption will change from up to eight percent to an average content of less than 0.25 percent.

The new bill will align allowable lead levels in all 50 states with the earlier adopted, permissible lead levels in California and Vermont. These laws do not prohibit the use of components containing more than 0.25 percent lead, but rather define a calculation to determine the lead content of the average wetted surface in the product. It is this average wetted surface that must contain less than 0.25 percent lead.

“At first glance, the legislation appears sufficiently simple and straight forward. Unless, that is, you’re in the business of installing, specifying, distributing or manufacturing new, compliant products and technology. There’s more to it than meets the eye,” said Bruce Fathers, director of marketing for Powers.

## In the beginning

The crucible moment happened with California’s precedent-setting introduction of Assembly Bill 1953 (AB 1953). In 2007, the bill was passed into law and became California Health and Safety Code Section 116875. Vermont had its own lead free legislation in process, and quickly adopted the California language. Maryland also passed lead free legislation mirroring California’s. California enacted additional controls, not yet adopted by other jurisdictions; specific to manufacturers is the need to certify products as compliant to the law with an ANSI-accredited third party.

The new federal law builds from these state level efforts to control lead in plumbing that conveys water for human consumption. At the manufacturing level, it’s now a ramp-up process to phase-in the lead free products while phasing-out the existing ones.

As manufacturers across the nation transition to lead free plumbing materials, a wide range of issues interact between product development, manufacturing process, distribution

and even metal recycling. Here’s a quick look at some of what’s involved.

The first step in complying with the new legislation is to understand the scope of the law. The California law was built around removing lead from water consumed through drinking or cooking. Yet, there are many uses of plumbing products and technology outside the scope of the California law such as irrigation, fire protection, heating systems and industrial uses.

Manufacturers must review their product offering and generally separate it into one of four groups:

- Compliant as is, regardless of intended use,
- Product only used in lead free required applications and must be reconstituted,
- Product to be used in either lead free or existing applications, and
- Products not to be used to convey water for human consumption.

## Materials and manufacturing

Selecting lead free materials is not as simple a process as it would seem. There are many options available to manufacturers, and each option has its own set of limitations. When complying with the lead free laws, there are many variables to address that cover multiple manufacturing processes, while being mindful of material suitability and product cost.

The primary options available for materials are lead free brass and bronze, stainless steels, and plastics. Each lead free technology has costs beyond the basic raw material to consider.

“Manufacturers have a responsibility to deliver lead free compliant products that meet the customers’ expectations for performance and serviceability. With the various material options that are available to meet the requirements of the lead free statutes, development of a material strategy is critical to maintain performance and deliver value to the end user,” said Jeff Scilingo, director of R&D engineering for Watts Water Technologies.

Casting lead free alloys is not as simple as it was with leaded formulations. New techniques and tooling have been developed and refined to process the new materials. When forging the lead free alloys, tighter temperature controls are required to maintain material performance.

Generally, removing lead from a material increases the difficulty and cost of machining. Carbide tooling, special coolants and potentially larger machining centers may be required. With some lead free materials the heat generated in

machining operations needs to be monitored. In many cases, the speed of the operations is decreased to produce high quality parts.

There has been significant work in the last five years by raw material providers to develop lead free alloys. Alternate materials have been commercialized, adding elements such silicon and bismuth to address the machining issues created by the removal of lead. Proprietary heat treatments of lead free materials have been developed to improve performance. These material issues generally cause lead free products to be more expensive to produce.

Ongoing development continues to produce new material options. "An organization must continuously monitor the materials market and apply a sound material strategy. We seek to align engineering performance 'must haves' with available manufacturing processes to insure that new lead free products maintain expected levels of performance and serviceability when compared to traditional materials," explained Joe Burke, principal engineer at Watts Water.

For products that have significant market volume in both lead free and existing applications, there is a desire to maintain two products to deliver the best value. For manufacturers this creates a need to separate leaded and lead free metals, parts, assemblies and even recycling.

Lead free brass looks the same as standard brass. So, systems are needed to prevent mixing of compliant and non-compliant parts in assembly areas.

Once the product is assembled, markings are helpful to identify the product after leaving the plant and all the way to installation. Even metal recycling will have its challenges. Lead free alloys containing bismuth or silicon cannot be recycled with the existing material.

### Answering customer questions

In addition to the manufacturing and logistical challenges, manufacturers must also address lead free needs with their customers. This includes answering questions like these:

- What products are affected by the law?
- How do you identify lead free compliant products vs. non-compliant products?
- How and when must inventory be transitioned?
- How does the change affect costs?
- How do changes in the law impact distributors, installers and end-users?

Fathers suggests that businesses must first understand the issue. They need to understand that the impact of new legislation is unfolding rapidly . . . and how it will affect them.

"Second, they need to make a transition plan," added Fathers. "For engineers and contractors, this may include planning for new specifications and understanding local enforcement. For distributors this may include transitioning their inventory and providing educational resources to their customers. Finally, once a plan is developed, they must effectively put it into action."

### How to get started?

For those impacted by the new national lead free legislation, making the transition to lead free products can appear overwhelming at first. "Partnering with a manufacturer who understands the impact of the law and has experience with the challenges of a change of this size is important," concluded Bill Tracey, western regional director of sales for Watts Water.

Ultimately the goal is to offer products that provide safer, cleaner water for families, communities and the future. **RJ**

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**FAST FACT:**  
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