

What is No-Lead Brass ...and how does it affect me?

A.Y. McDonald Mfg. Co. No-Lead Brass products meet the requirements of UNS Copper Alloy C89836 per ASTM B584-05 and Copper Alloy CDA No. C89833.

UNS Copper Alloy C89836 Mechanical properties and Chemical composition have been certified by an independent testing agency and are listed in ASTM Volume 2.01 for "Copper and Copper Alloys" in specification B584-05 Copper Alloy Sand Casting for General Applications (compositions and mechanical properties).

A.Y. McDonald's No-Lead Brass contains a high percentage of copper and **3 main alloying elements - Zinc, Tin and Bismuth.**

- ◆ **Zinc** is a potent alloying element in copper, imparting strength and hardness.
- ◆ **Tin** is a potent solid-solution strengthener in copper, even more so than zinc. Unlike zinc, tin also improves corrosion resistance.
- ◆ **Bismuth** acts very much like lead in many respects. Bismuth is lead's neighbor on the periodic chart of elements making its behavior during casting and solidification similar. Bismuth is nearly insoluble in copper and causes machining chips to break up into small easily removed particles. Unlike lead, Bismuth is not known to be toxic in humans.

A.Y. McDonald No-Lead Brass products meet the requirements of ANSI/AWWA C800-05.

Both C89833 and C89836 have been recognized as an acceptable material for California Prop 65.

A.Y. McDonald's No-Lead Brass alloy shall contain not more than one fifth of one percent (0.20% or less) total lead content by weight.

Lead composition range:

85-5-5-5 (C83600)	4.00-6.00%
AY No-Lead Brass	0.00-0.20%

*** Yield Strength, min.:**

85-5-5-5 (C83600)	14 ksi
AY No-Lead Brass	14 ksi

** Yield strength shall be determined as the stress producing an elongation under load of 0.5 %, that is, .01" in a gage length of 2.00".*

Lead leaching from many Waterworks No-Lead Brass components is virtually zero per the NSF 61 section 8 testing and normalization protocol. A.Y. McDonald has received ANSI accredited certifications for Brass Fittings, Meter Couplings, Plug Curb and Plug Corp, Ball Curb and Ball Corp and Check Valves in 2" and smaller sizes. Product certification sheets are available by request.

Machined surface measurements show surface finish and quality on the Bismuth-Selenium and Bismuth No-Lead brass alloys are equal or better than those produced with traditional leaded brasses.

Independent testing agency Corrosion Behavior studies of Bismuth-Selenium and Bismuth red brass alloys have shown them to be equal to that of 85-5-5-5 (C83600). These No-Lead alloys have a significant history of use in Meters, Backflows and underground Waterworks brass products without reported corrosion issues.

Modified Red Brass with Bismuth and Selenium Research information has been published by AFS (American Foundrymen's Society, Inc.). The research was developed by testing agencies and guided by a consortium including AFS, the Copper Development Association along with Ingot manufacturers, metalcasters and copper-alloy casting users.

This research information includes chemical composition variations, Alloy characterization, Foundry trials, Environmental Considerations, Leach data, Machinability and corrosion resistance. A.Y. McDonald has repeated a number of these trials and tests as we have prepared for No-Lead brass production.

“The lead-free alloys were developed to have foundry characteristics (melting and casting) as well as properties (physical and mechanical) similar to existing leaded alloys. In other words, there should be no differences in the foundry practices currently being used for leaded alloys. In addition, the design of the existing components need not be modified to satisfy property considerations.”

--Modern Casting, October 2003

A.Y. McDonald has been involved in research of No-Lead brass options for well over 10 years. We have been manufacturing No-Lead brass products in excess of 5 years.



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No-Lead Brass Legislation ...and what it means to you

Recent California Legislation has set forth a new set of guidelines regarding the use of lead free brass in public water systems. Existing law prohibits the introduction into commerce of any pipe, pipe or plumbing fitting, or fixture that is not lead free, except for a pipe that is used in manufacturing or industrial processing. Per Assembly Bill #1953, the new legislation will, commencing on January 1, 2010, revise this prohibition to apply to any pipe or plumbing fitting, or fixture intended to convey or dispense water for human consumption. What this means is that

The exact wording of the bill states “No person shall use any pipe, pipe or plumbing or fixture, solder, or flux that is not lead free in the installation or repair of any public water system or any plumbing in a facility providing water for human consumption, except when necessary for for the repair of leaded joints of cast iron pipes.”

The bill defines “lead free” as follows - “lead free” means not more than 0.2 percent lead when used with respect to solder and flux and not more than a weighted average of 0.25 percent when used with respect to the wetted surfaces of pipes and pipe fittings, plumbing fittings, and fixtures.”

What this means to you is that any of the defined products which do not meet the definition of “lead free” according to this legislation cannot be installed beginning January 1, 2010.



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No-Lead Brass Technical Specifications

NO-LEAD BRASS FITTINGS AND VALVES

1. GENERAL

All brass fittings and valves for service lines shall be provided under this contract.

2. PRODUCT

- a. All fittings and valves shall be manufactured in accordance with AWWA Standard C-800, latest revision, and as further specified in these technical specifications.
- a.i Exception: Any brass part of the fitting or valve in contact with potable water shall be made of a “No-Lead Brass”, defined for this specification as UNS Copper Alloy C89520 in accordance with the chemical and mechanical requirements of ASTM B584, or copper alloy CDA No. C89833. This “No-Lead Brass” alloy shall contain not more than one fifth of one percent (0.20% or less) total lead content by weight.
- a.ii Any brass part of the fitting or valve not in contact with potable water shall be made of 85-5-5 brass as defined for this specification as UNS Copper Alloy C83600 per ASTM B62, ASTM B584 and AWWA C-800.
- b. All brass fittings and valves shall be certified by an ANSI accredited test lab per ANSI/NSF Standard 61, Drinking Water Components – Health Effects, Section 8. Proof of certification is required.
- c. Brass fittings and valves shall comply with the Safe Drinking Water Act, and the U.S Environmental Protection Agency.
- d. All brass fittings and valves shall have the manufacturers name or trademark integrally stamped or cast on it. Another marking identifying the “no-lead” brass alloy, e.g., ‘NL’, shall be cast or stamped on the fitting or valve.

3. QUALITY CONTROL AND TESTING

If requested, an affidavit certifying compliance with these standards and specifications shall be signed and submitted by the manufacturing firm’s Quality Assurance or Engineering Manager.

4. MANUFACTURER

The brass fittings and valves shall be produced by a North American manufacturer.



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No-Lead Brass

ANSI/NSF Drinking Water System Components—Health Effects

ANSI/NSF 61 Compliance versus Certification

■ ANSI/NSF 61 Certification requires products to be evaluated and tested by an ANSI accredited lab or testing agency. Testing includes organics (rubber seals, plastic components, and/or lubricants), regulated metals, and other inorganics (asbestos, chlorine, nitrates, etc...). In addition to the initial evaluation, testing, and certification process, these agencies audit manufacturers on regular intervals to review records and retest stock products to the NSF requirements.

A compliance claim is not recognized by NSF. It is simply a way for a company to confuse people into believing that they have NSF recognition. These claims may be narrow in scope and can be easily misconstrued.

Products that are ANSI/NSF 61 Certified by a 3rd party certifier leave no question as to whether or not they fully meet the requirements of ANSI/NSF 61. The certification mark will appear on the packaging of the product.



Listed below are the six ANSI accredited agencies currently able to provide the ANSI/NSF 61 certification. Any company's list of products certified to ANSI/NSF 61 can be reviewed through the specific agency certifying their products. See the website links below.

NSF 61 ANSI Accredited Labs

NSF International	http://www.nsf.org/Certified/PwsComponents/
Underwriters Laboratories Inc	http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm
Truesdail Laboratories Inc.*	http://www.truesdail.com/index.html
CSA International	http://directories.csa-international.org/
IAPMO	http://pld.iapmo.org/
WQA	http://www.wqa.org/

* - A.Y. McDonald ANSI/NSF 61 certified products are listed with Truesdail Laboratories Inc.

ANSI / NSF 61 Definition

■ ANSI/NSF 61 is a standard that was created to establish minimum health effect requirements for chemical contaminants and impurities that are introduced into drinking water from products, components, and materials that are used in drinking water systems.



No-Lead Brass

ANSI/NSF Drinking Water System Components—Health Effects

- The following are some of the contaminants* that are tested for per ANSI/NSF 61:

Organics/Pesticides

- Rubber Seals
- Plastic Components
- Lubricants

Regulated Metals

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Selenium
- Thallium

Other Inorganics

- Items like asbestos, chlorine, nitrates, etc.

* See ANSI/NSF 61 for a complete listing of identified contaminants.

ANSI/NSF 61-4 Pipes and Related Products

- Section 4 of ANSI/NSF 61 applies to pipes and pipe related products.

ANSI/NSF 61-8 Mechanical Devices

- Section 8 of ANSI/NSF 61 applies to devices, components, and materials that are used in water treatment/transmission/distribution systems, and are in contact with water used for human consumption and/or treatment chemicals.
- **In general, Waterworks Brass products are covered by section 8 of ANSI/NSF 61.** A.Y. McDonald's waterworks line falls under the in-line device classification of ANSI/NSF 61-8. The following products are classified as inline devices: backflow preventers, building valves, check valves, compression fittings, corporation stops, curb stops, expansion tanks, meter couplings, meter stops, pressure regulators, pressure tanks, service saddles, strainers, valves and fittings, and water meters. The following inline devices are specifically excluded from ANSI/NSF 61 requirements: boiler feed valves, drilling and tapping machines, temperature and pressure relief valves, valves with hose thread outlets, and water meter test benches.

ANSI/NSF 61-9 Mechanical Plumbing Devices

- Section 9 of ANSI/NSF 61 applies to mechanical plumbing devices, components, and materials that are typically installed within the last liter of water distribution systems used for human consumption. These products are also called endpoint devices. Typical devices are faucets, hoses, and small shut off valves. The following endpoint devices are specifically excluded from ANSI/NSF 61 requirements: bath and shower valves, shower heads, Roman tub valves, drains, pre-rinse assemblies, and all endpoint devices not specifically intended to dispense water for human consumption (utility, laundry, laboratory, bidet, and shampoo fittings; faucets with hose thread spout ends or quick disconnect ends; self closing, metering, or electronically activated faucets; and non-lavatory hand wash stations).



No-Lead Brass In the News

Lead on tap | Salon News

http://archive.salon.com/news/feature/2006/11/27/lead/index_np.html

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By Michael Scherer

Lead on tap

An alarming return of lead in drinking water is being ignored by the EPA and municipal officials.

By Rebecca Renner

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To this day, officials involved in the D.C. crisis contend that no one was significantly harmed by D.C.'s lead problem. But Salon has recently learned that one of the most compelling pieces of evidence for the "no harm" conclusion has been falsely represented. During the crisis, the city's Water and Sewer Authority and Health Department sent inspectors to the homes of children with elevated blood lead to look for the source. At a 2004 congressional hearing investigating the causes of the exposure, D.C. water authority general manager Jerry Johnson testified that in every case the assessments showed that water was not the source of the child's lead exposure.

But a recent examination of the assessment reports reveals that water is the sole source of the blood poisoning in some homes and that assessors found high levels of lead in tap water in many other homes. The reports were obtained through Freedom of Information Act requests by Virginia Tech environmental engineer Marc Edwards, a leading authority on water corrosion, who first called attention to D.C.'s lead problem. Since then, Edwards has been conducting his own investigation of the crisis and has established a clear connection between lead-contaminated water and elevated blood lead levels in some D.C. children. "The assertion that no one was harmed in D.C. contradicts decades of scientific research on dangers of lead in drinking water," he says.

Numerous studies confirm that very low levels of lead in kids' blood are linked to short attention spans and reading problems. In adults, low levels are linked to high blood pressure and an increased risk of death from heart disease and stroke.



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High lead levels found in drinking water at Queen's Park

Thursday, May 31, 2007 - 07:56 AM
By: John Stall, with a report from Canadian Press

Toronto - Politicians and staff have been advised not to drink the tap water at Queen's Park because of lead contamination.

Twenty-two water sites at the legislature were checked and seven of them had high lead readings.

This came just as MPPs were voting on new clean water legislation - a week after Ontario's chief water inspector ordered 36 cities and towns to test the water in older homes.

High levels of lead had already been found in several Ontario communities, including in London, Hamilton, Owen Sound and Samia.

The water legislation was partly the result of E. coli contamination in Walkerton, Ont. that killed seven people and left thousands sick.

Environment Minister Laurel Broten said the test results are a poignant reminder of the need for clean, safe drinking water.

Meanwhile, NDP Leader Howard Hampton has called for an aggressive testing program of tap water in every community throughout Ontario.

"If you have unacceptably high levels of lead in the drinking water here, what that suggests to me is that we need some very aggressive testing of water at the tap, in communities (across) Ontario," Hampton said.

He also said the Liberal government has been trying to play down the issue of lead in drinking water - claiming there is no problem.

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Breaking

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Mom worries about lead in water

Pregnant women and children under six most at risk from contamination

By Natalie Pona
The Hamilton Spectator
(May 24, 2007)

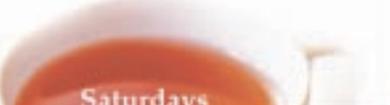
Wendy Leigh-Bell never drinks from the tap.

The 50-year-old Hamilton mom said she's suspicious that contaminants may lurk in her family's drinking water.

That's despite having the old pipes leading to her home on Kent Street changed in 2000 in light of tests showing her water had three times the acceptable level of lead.

With two kids, she still worries lead may leach into the water from some other source in the system, said Leigh-Bell. She only gives her family bottled or filtered water.

"I feel that we've done as much as we can ... we don't drink water straight out of the tap," she said.

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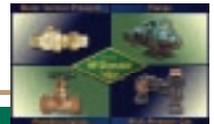
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