

Healthy Homes and Lead Safety

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www.HealthyHomesandLeadSafety.org

Where Lead Hides

Helpful Websites

Healthy Homes and Lead Safety: www.HealthyHomesandLeadSafety.org

Environmental Working Group: www.ewg.org, click on *Skin Deep: Cosmetic Safety Database*

The Ecology Center: www.healthytoys.org

Lead Advisory Service Australia: <http://www.lead.org.au/lasn/lasn006.html>

General Warning

If you ever see a label on any product that states *Proposition 65 Warning: Use of this product will expose you to lead, a chemical known to the State of California to cause birth defects or other reproductive harm* or *Not intended for food use*, heed the warning!

SURFACE COATINGS

Paint

There is a federal regulation (16 C.F.R. 1303) that bans specific uses of lead in paint or other similar surface coatings of greater than 90 ppm. The US Consumer Product Safety Commission enforces this regulation.

- **What is covered and should not contain lead:**

- Products sold directly to consumers or which consumers use in homes, schools, hospitals, parks, playgrounds, and other areas
- Toys or other articles intended for use by children (ages 12 and younger)
- Furniture coated with paint such as beds, bookcases, chairs, chests, tables, dressers, and console televisions

- **What isn't covered and may contain lead:**

- Appliances such as ranges, refrigerators, and washers, fixtures such as built-in cabinets, window, and doors, and household products such as window shades and venetian blinds.
- Paints for boats and cars

- **Exempt from regulation but require warning label:**

- Coatings used to refinish industrial or agricultural equipment
- Building and equipment maintenance coatings
- Products marketed solely for use on billboards, road signs, and similar products
- Touch-up coatings for agricultural equipment, lawn and garden equipment, and appliances
- Catalyzed coatings marketed solely for use on radio-controlled model powered airplanes.

- **Exempt but no warning label required:**

- Mirrors with lead-containing backing paint
- Artists paints
- Metal furniture (other than children's furniture) that has a factory-applied coating that contains lead.

<http://www.cpsc.gov/PageFiles/119088/regsumleadpaint.pdf>

Consumer Product Safety Improvement Act (CPSIA)

On February 27, 1978, a ban was placed on the sale of consumer products, as defined above, that contained lead >600 parts per million (ppm). On August 14, 2008, the Consumer Product Safety Improvement Act (CPSIA) was signed into law. This law lowers the allowable limit for the lead content of consumer products and, more specifically, children's products (products designed for children 12 years old or younger). Under the law, the limit for lead in paint and similar surface-coating materials (e.g. shellac, varnish, glazes) on all consumer products is 90 ppm.

Children's products cannot have any parts that contain more than 100 ppm lead. As of December 31, 2011, importers and manufacturers of children's products that are subject to the lead content standard will be required to issue certificates affirming that their products have been tested by a CPSC-approved third-party laboratory.

The CPSIA applies to the resale of items at antique stores, consignment shops, flea markets, and thrift stores, as well as to new products. While sellers/resellers are not required to test all products, they cannot knowingly sell products that do not meet the requirements of the law. According to the Consumer Product Safety Commission (CPSC), ignorance of the law is not an excuse.

Paint sources

- **Homes, daycare center, school, camp, relative or friend's home**

Lead increases the durability of paint and resists mold so it was most often used on home exteriors, window and door trim, in bathrooms, and kitchens. For houses built before 1978, and especially those built before 1950, chances are good that lead paint was used. Lead paint becomes hazardous only if it is cracking or chipping, if it is disturbed (a painted wall is torn down or cut), if it is on a high-friction area that produces lead dust (like the insides of windows and doors), or a high impact area (like stairs or floors). Because of friction when windows are opened and closed, window troughs and sills are a common place for lead dust to accumulate.

Helpful hints: Wipe window sills and troughs often with a damp disposable rag. Simple, inexpensive procedures exist to cover over lead surfaces. Avoid placing food items or allowing pets to rest there. Find and fix the source of failing paint. Never dry scrape, dry sand, or use a heat gun over 1100° F on lead paint. This creates lead dust or lead fumes. Clean with wet mops and a HEPA filtration system vacuum cleaner. Change contaminated clothing and wash separately from children's clothing.

- **Antique painted furniture (including cribs), buttons, hair ornaments**

- **Home-made Cold Frames for plants**

Websites recommend reusing old window frames to create these mini garden greenhouses. If lead-based paint chips off and falls into soil, leafy vegetables and root vegetables may absorb lead. I've seen many of examples of this locally.



- **Old painted toys**

When old toys are considered *collector's items*, they are no longer considered *children's items* and are therefore not regulated as such.

- **Lead paint on kitchen utensils**

- **Imported painted toys**

Check recalled items at www.cpsc.gov; however, if a toy is not recalled, it doesn't guarantee it is lead-safe.

- **Automobiles primers and topcoats**

- **Marine primers and topcoats**

Old red lead paint was used on metal surfaces to inhibit rust and contained lead.

- **Road-marking paint**

- **Playground equipment**

Not only may children be in direct contact with lead paint, but as equipment weathers and paint chips off, children may come into contact with the contaminated soil.

www.southwestfairhousing.typepad.com/lead/



- **Industrial paints**

Lead was banned from residential paints in 1978 by the US federal government, but it is still allowed in industrial, marine, and bridge paint. Fortunately, some business owners no longer choose to use lead paint.

- **Paint used on steel bridges**

Since lead-based paint inhibits rust and corrosion on iron and steel, it has been used on bridges and other steel structures. It is estimated that more than 90,000 bridges, many in need of repair in the United States, are coated with lead paint. Lead dust and fumes are released into the air whenever lead paint is disturbed during maintenance, reconstruction, and demolition of bridges and other steel structures.

- **Face Paints/Theater Face Paints**

In 2009, the Campaign for Safe Cosmetics had an independent lab analyze 10 different face paint products. All contained lead. The quantities ranged from .054-0.65 ppm lead. Lead is banned from cosmetics in Canada and Europe but not in the US. While there is limited evidence that lead can be absorbed through the skin, there is still a chance for ingestion. The limit for lead in candy consumed by children is 0.1 ppm.

http://safecosmetics.org/downloads/PrettyScary_Oct2709.pdf

- **Artist's Paints and Supplies**

Lead is found in very few art materials, namely in certain ceramic glazes, flake white oil color, and lead chromate colors in both oil and water colors. Flake white is an oil color which some artists feel is essential to prepare an oil canvas. It gives the art work the permanence needed and there is no substitute. Because of this, flake white was exempted from the ban on lead in paint under the U. S. Consumer Product Safety Act. However, it still must be labeled with health, cautionary and safe-use information. Lead chromate colors are found in traditional artists color ranges and contain low levels of soluble lead. Many pastels contain asbestos, contaminated talc, lead and cadmium pigments. <http://www.leadsafe.org>

Pigments containing lead or arsenic have long been recognized as being dangerous. This group includes flake white or Cremnitz white (made of lead carbonate), Naples yellow (when made of lead antimoniate pigment), the chrome yellows (made of lead chromate), chrome green (made of mixtures containing lead chromate), cobalt violet (when it contains cobalt arsenate) and greens such as Schweinfurt green, emerald green, Paul Veronese green or Paris green (when made of arsenic compounds such as copper acetoarsenite). Since 1975 many reports have called attention to the possible dangerous effects of pigments containing cadmium, chromium, manganese, and mercury. These colors include the cadmium reds, cadmium yellows, cadmium orange, viridian and chrome oxide opaque, manganese blue, manganese violet, burnt and raw umber, and vermilion (mercuric sulfide). Pigments can enter the painter's body if they get into the artist's mouth, if they penetrate the skin through cuts and scratches, or if the painter inhales them. If artists frequently absorb pigments by any of these methods, they may develop various levels of health problems. <http://www.noteaccess.com/MATERIALS/ToxicityPigmt.htm>

Old Holland Classic Oils are packed in soft lead tubes with a thin layer of pewter, as opposed to an aluminum tube which oxidizes within 15 years. "Lead tubes last a lifetime," the company boasts.

Helpful hint: The CP (Certified Product), AP (Approved Product), and HL Health Label (Non-Toxic) Seals identify art materials that are safe and that are certified in a toxicological evaluation by a medical expert to contain no materials in sufficient quantities to be toxic or injurious to humans, including children, or to cause acute or chronic health problems.



MEETS PERFORMANCE STANDARD *
CONFORMS TO ASTM D-4236



CONFORMS TO ASTM D-4236



Avoid inhalation: When using the pigments in the form of dry powders, handle them with care so as to avoid raising a great deal of pigment dust. Keep yourself and work areas free of dust from pastels. Keep scraped paint particles out food, off skin, and out of lungs. If you use spray cans or air compressor sprayers, the finely divided pigment in the sprays can remain in the air, be inhaled, and can drift onto food or dishes close by. If

you burn paint, the fumes can be dangerous. Wear a NIOSH approved respirator if there will a lot of dust, spray, or fumes generated. Use damp cloths and mops for cleaning. Wash dirty cloths separate from children's clothes.

Avoid ingestion: Keep cigarettes, food, and drinks far from work areas. Never place paint brushes in your mouth or painted paint brush handles (in 1992 Grumbacher recalled paint brushes because their handles were coated with lead-based paint.) Wash all supplies away from food preparation areas. Scrub hands thoroughly.

Avoid absorption: Keep paint and pigments away from skin. Undesirable pigments can be absorbed through breaks in the skin, and some can cause allergic responses or dermatitis (inflammation of the skin.) If you have cuts or blisters on your hands and must handle colors keep the cuts bandaged or wear disposable gloves.

<http://www.noteaccess.com/MATERIALS/ToxicityPigmt.htm>

Paint driers

Black oil is a fast drying medium made from linseed oil and lead oxide, historically significant for icon painting and other historical painting techniques. Gel-painting medium combines drying oil with mastic varnish.

Varnish and Shellac

The federal definition of lead-based paint is actually: Any existing paint, **varnish, shellac or other coating** that is in excess of 1.0 mg/cm² as measured by an XRF detector or greater than 0.5% by weight (5,000 ppm) from laboratory analysis. (Some states have definitions that are stricter for example, the definition in South Carolina is > 0.7 mg/cm².) For new products, lead content can not exceed 90 ppm!

Inks

- **Printing inks** can contain lead. Printing inks are used for screen printing onto fabrics and printing on plastic or other non-paper materials (i.e. not used on paper books). Since much printing involves the use of the *four-color process* with which lead is not compatible, lead is not used. Leaded inks are mostly reserved for projects where the ability to withstand weather conditions is a factor, such as outdoor signs and labels. Lead may also be used to create *spot colors* – specific colors unachievable using the four-color process. Screen printing uses UV inks, water-based ink, plastisols, and/or solvent-based inks. Plastisol inks are made with PVC, and PVC may contain lead. <http://www.cpsc.gov/BUSINFO/frnotices/fr09/leadcontent.html>

- **Newspaper inks**, as of 1985 in the US, should no longer contain lead. Over 95 percent of daily newspapers now use non-toxic soy ink. The Newspaper Association of America (NAA) says there is no evidence of measurable leaching of metals (or other hazardous materials) from the ink or newsprint and states on their website that they *developed guidelines for lead, chromium, and cadmium in inks at levels below 250 parts-per-million, an amount well below the Consumer Product Safety Commission's (CPSC) 600 parts-per-million standard for lead in the paint on children's toys*. The CPSC currently states that ordinary printing on paper is subject to compliance with the total lead content requirement which is now 100 parts per million (2013).

- **Older books** were not manufactured using modern printing processes and may contain leaded ink or components. In 1985 it became unlawful to use lead pigments in the inks, dyes, and paints used in children's books. Children's books from before 1985 may contain lead and should not be sold. Adult books from before 1985 may also contain lead, but since they are not considered a children's product they are not regulated as such.

SOIL AND PLANTS

Soil

Soil may contain lead due to:

- Deposits from the air from industrial sources. Burning coal and petroleum releases lead into the air.
- Some previous use that involved lead products
- Some current use, like an auto body shop, hobbies that use lead, etc.

- Lead paint chipping off a building or structure
- Remnants of leaded gasoline (the USA and Mexico stopped using leaded gasoline in 1996. Soil may still contain lead.)
- Pesticide and/or herbicide use
 - Lead arsenate was used 1925-1955 in apple orchards.
- Natural geological sources

The majority of the highest soil lead levels are located within the 1-3 foot drip line around the home.

Concentration decreases with an increase in distance from the building. According to EPA:

Children's play areas should not exceed 400 ppm lead.

Overall yard soil should not exceed 1200 ppm.

Soil with lead levels >5000 ppm should be abated.

Average background levels of lead in soil in non-urban areas are 2-200 ppm. Generally, it has been considered safe to use garden produce grown in soils with total lead levels less than 300 ppm. The risk of lead poisoning through the food chain increases as the soil lead level rises above this concentration. Even at soil levels above 300 ppm, most of the risk is from lead contaminated soil or dust deposits on the plants rather than from uptake of lead by the plant. <http://www.extension.umn.edu/distribution/horticulture/DG2543.html>

If lead is a concern, the best crops to plant are *fruiting* crops such as tomatoes, squash, peppers, okra, cucumbers, peas, beans and corn. These plants take up very little, if any, contaminants in the parts we eat. *Root* crops, such as carrots, beets and potatoes, can take up arsenic and lead from the soil. Most of the contamination can be removed by peeling the skin off root vegetables before eating. Even after peeling, a small amount of the chemicals will remain in the flesh of the root vegetable. *Leafy greens*, such as lettuce, spinach, beet greens and herbs, can absorb lead into the plant. The surface can get contaminated with lead from the dust or soil that settles on leaf surfaces.

- **Helpful hints:** Children and pets are most often exposed where there is bare dirt. Cover bare soil with grass, mulch, or shrubs. Avoid growing edible plants, like herbs, leafy greens or root vegetables, in contaminated soils, especially near roadways or near houses with chipping lead-based paint. Test soil. To reduce plant uptake of lead and arsenic:
 - Grow crops in raised beds
 - Add topsoil and store-bought compost to your garden soil to dilute the amount of contaminants. Know the source of that soil!
 - Adjust the pH of the soil to neutral, 6.5-7.0 (for acidic soils, add lime.)
 - Throw away contaminated peelings, plants, grass clippings, and leaves. Do not make compost from them. Soil or dust that has lead or arsenic may stick to fruits, vegetables, shoes, hands, and clothes.
 - Wash all homegrown or store-bought foods well before you eat them a 1% vinegar solution, soapy water or a commercial vegetable-cleaning product.
 - Scrub and peel root vegetables (like carrots or potatoes) before you cook or eat them.
 - Wash hands as soon as you are done working in the garden or yard. Avoid eating while in the garden.
 - Take off or wipe your shoes before going into your home.
 - Wash dirty clothes separate from other laundry after yard work or gardening.
 - Wash toys and pets often.

Pets

Animals can carry lead dust in their fur which can easily be transferred to anyone handling them. Wash often! And yes, pets can be poisoned by lead too.

WATER AND BEVERAGES

Drinking Water

To test your well water for lead, contact your local health department or find a certified lab at <http://water.epa.gov/scitech/drinkingwater/labcert/statecertification.cfm>. If you receive city water, contact your local water treatment facility and request a recent water quality report. The Safe Drinking Water Information System (SDWIS) contains information about public water systems and their violations of EPA's drinking water regulations, as reported to EPA by the states: <http://www.epa.gov/enviro/facts/sdwis/search.html>

In December 2009, the Environmental Working Group released a report on the quality of our drinking water from our public water utilities: <http://www.ewg.org/tap-water/executive-summary>. Search here by state for findings: <http://www.ewg.org/tap-water/statereports>.

Lead can be found dissolved in drinking water or can be present as particulates – usually small pieces of lead solder or lead rust that becomes detached from pipes. Because release of particles is sporadic, it is harder to capture this source in a water test.

Houses built before 1986 may have lead pipes, galvanized pipes (which contain lead), or copper pipes soldered with lead. All of these are a source of lead contamination in drinking water. In 1986, the US banned lead from use in new drinking-water-supply pipes and from flux and solder used to join these pipes. (The N.C. Building Code Council banned lead solder in 1985.) Lead-safe pipes are not lead-free - by definition they can contain up to 8% lead. Lead-free solder can contain up to 0.2% lead.

Buildings up through the early 1900's commonly used lead interior pipes. Plumbing before 1930 is most likely to contain lead. Between 1920 and 1950, galvanized pipes were used for plumbing. After 1930, copper generally replaced lead. Up until the late 1980s, lead solders were typically used to join copper pipes. The lead-free requirements of the 1986 Safe Drinking Water Act mean lead solder with more than 0.2% lead and plumbing with more than 8% lead were banned in 1987. Buildings did not have to be built with certified *lead-free* fixtures until 1997. New buildings are unlikely to have lead pipes, but they are likely to have copper pipes with solder joints. Buildings built prior to 1986 are likely to have joints made of lead solder. Some brass fittings although they contain less than 8% lead in alloy may still contribute a significant amount of lead to drinking water.

Water that is highly acidic or highly basic is considered corrosive and can dissolve lead from pipes, solder, and fixtures more easily. Hard water, with lots of minerals, can offer some protection as it may cause mineral buildup on the inside of pipes thus reducing the contact of water with the lead. Corrosion can be vigorous in new piping until a protective layer is built up. After about 5 years, the reaction usually slows down. If water supplied to a facility is corrosive, lead can remain a problem regardless of the age of the plumbing. If the water system changes one of its chemical processes, lead can suddenly leach out of a distribution system that formerly had a protective barrier. One such example is changing the disinfectant from hypochlorite (or "chlorine") to chloramines.

- **Lead pipes**

Lead pipes are dull gray in color and may be easily scratched by an object such as a key or knife. Lead pipes are a major source of lead contamination in drinking water.

- **Brass pipes, faucets, valves, fittings, well pumps**

Brass pipes, faucets, valves and fittings are a golden yellow color, similar to copper in appearance, or are plated with chrome. Brass is composed of two metals, commonly copper and zinc. Brass fittings commonly used in drinking water outlets, such as faucets and water coolers, in general contain up to 8 percent lead. This is considered "lead-free" under the Safe Drinking Water Act. Contamination may still take place. The amount of lead that will leach from brass products with less than 8% lead is dependent upon the corrosiveness of the water

and the processes employed in manufacturing the products. Some older brass fixtures may contain higher percentages of lead solder in their interior construction. It is important to verify that these fittings are lead-free.

- **Bulk water storage tanks with lead soldered seams or brass fittings**
- **Chrome-plated faucets**

Chrome-plated faucets are generally made of brass which contains 3 to 8 percent lead.

- **Lead solder (often used for copper pipe joints, copper and brass faucets joints, old copper kettles, electric kettles.)**

Copper pipes are red-brown; corroded portions may show green deposits. Copper pipe joints have been typically soldered together with lead. Experts regard the corrosion of lead solder as the major cause of lead contamination of drinking water today. Lead solder was banned in 1986.

- **Galvanized pipes**

Galvanized metal pipes are gray or silver-gray and are usually fitted together with threaded joints. In some instances, compounds containing lead have been used to seal the threads joining the pipes. Debris from this material which has fallen inside the pipes may be a source of contamination.

Galvanization is a process that applies a zinc coating to steel or iron. There are trace amounts of lead in all zinc because zinc and lead are often together when mined. Higher grade zinc will have less lead contamination but lower grades may have up to 1.4% lead. There is no completely lead-free zinc. Pipes used for water must be NSF rated which means they will have a lower lead content.

I received conflicting answers about whether older galvanized products had more lead than newer. A gentleman who worked in the steel industry told me that galvanizers used to add lead as a flowing agent to the zinc vats because lead had a low melting point and allowed the zinc to flow better which helped with the coating process but that lead is no longer added. He used trashcans as an example – they used to have a large flower pattern in the metal called “spangle” and, since the 1990’s, they now have a small flower pattern which is a result of having less lead. Matt Gill, American Galvanizing Association, 1-800-468-7732, told me that the grades of galvanized products have not changed much over time. He said that lead was never added, it was just naturally occurring and served as a flow agent. In the two higher grades, the zinc is refined more to remove lead. Bismuth is used as a flowing agent instead of lead. One can’t distinguish the various grades by appearance.

1. Prime western grade = less than or equal to 1.4% lead
2. High grade = less than or equal to 0.03% lead
3. Special High grade = less than or equal to 0.003% lead

The zinc used must not be less than 98% zinc, 2% impurities. The concentration of lead in the bath will be higher than what ends up on the product. Approximately 25-75% of the lead will get transferred. All grades are okay for potable water if they meet NSF 61 Certification.

- **Lead connectors**

Lead piping was often used for service connectors that join buildings to public water supplies.

- **Polyvinyl Chloride (PVC) piping**

Metals are used to stabilize vinyl products like PVC. Lead is one metal that may be used. Around 1995, USA industry stopped using lead in PVC pipes but pipes older than 1995 and those manufactured abroad may contain lead. Be sure PVC pipes meet National Sanitation Foundation (NSF) standards and are free of plasticizers which contain lead. (For copy of the standard, contact NSF, 3475 Plymouth Road, P.O. Box 1468, Ann Arbor, MI 48106.)

Sunlight causes the breakdown of PVC and release of lead. Because most water pipes are not exposed to sunlight, they are not likely to decompose very rapidly and studies at UNCA showed very low levels of contamination. <http://pasture.ecn.purdue.edu/~schildre/health/survey.txt>

- **Other fittings containing lead**

Lead solders or lead in the brass fittings used in some faucets, water fountains, and refrigerated water coolers may be a source of lead. It is important to identify the locations of all such drinking water outlets.

- **Water from lead-soldered water tanks or run-off systems from roofing with lead-based paint** also may pose a risk, especially in areas near mining and smelting sites where dust and emissions could add to the problem.
- **School Drinking fountains**
The drinking fountains in elementary schools across the country were tested and some were found to contain high levels of lead. Federal law mandates the states to correct the situation.

Helpful hints:

- Have your water tested for lead. Find an EPA-certified lab:
<http://water.epa.gov/scitech/drinkingwater/labcert/statecertification.cfm>
- Consider using PEX piping that meets ANSI/NSF Standard 61. The basic building blocks of PEX are cross-linked polyethylene molecular chains that are called polymers. According to UNCA's Environmental Quality Institute's Dr. Rick Maas, PEX is the most inert piping discovered yet, meaning it releases virtually no chemicals. The fittings may be leaded brass, copper, or bronze and may have up to 5% lead but most don't come in contact with the drinking water or have minimal contact. Leaded brass valves, however, may contribute lead to drinking water.
- Allow your water to run until it is as cold as it can get (which may take 5 seconds or >2 minutes) before use for cooking or drinking if the water has gone unused in the last 6 hours (more time if the service line to the water main is lead – a plumber can check.) If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more and sometimes larger pipes than smaller building. Ask your landlord for help in locating the source of lead and for advice on reducing the lead level.
- Use cold water instead of hot water for cooking/drinking (hot water dissolves more lead from pipes.)
- Remove loose lead solder and debris by periodically removing the faucet strainers from all taps and rinsing out well.
- Install a water filter that removes lead and replace filters as directed. (See below.)

Water-pitcher Filters

Old governmental standards required filters to remove soluble lead. In 2007, changes in water filtration standards required reduction of lead particles in addition to soluble lead to a level less than 10 ppb. There are several water-pitcher filters that meet the higher standards (NSF-53) for lead – the ZeroWater Pitcher, ZP-001, by Zero Technologies, Eco by Tupperware, and many Brita products. Check the labels.

Water Filtration Systems

Studies in 1998 discovered that leaded brass was used in some water filtration systems. Consumers bought these systems to remove lead from their drinking water, but the study found that many systems were actually adding lead into drinking water. Litigation led to rapid conversion of the filtration industry to lead-free materials. Today, much of the industry has switched to zero-lead materials downstream of the filter. If you have a filtration system from 1998 or older, have your water tested for lead.
<http://www.ceh.org/component/content/article/499>

Of the 16 filters tested by the Center for Environmental Health, the Omni and Franke filters products listed below were identified as adding the highest levels of lead; the other four raised lead levels slightly.

Omni OT-2. Omni acknowledges it has used lead-containing faucets in other models as well and is in the process of changing to plastic components in all models. For a free replacement faucet for any Omni filter, call 800-937-6664.

Franke UF. Franke has taken this model off the market. For a full refund, call 800-626-5771. A company spokesperson says other Franke models do not have the same problem.

Ametek CCF. The No.1 seller of home water-filter systems. Ametek has agreed to change its entire line of products to stainless-steel or plastic faucets by November 1, 1998. If you already own an Ametek filter, the company will send you a replacement part free of charge; call 800-222-7558.

Amway WTS. Amway says the CEH study is "scientifically flawed" and notes that its filter meets all EPA and NSF standards. While a letter from the company conceded this product may leach small quantities of lead, the amounts remain below EPA action levels. The company is not taking corrective action.

Aqua-Pure CRF. The company is in the process of changing to stainless-steel components in all models. For a free replacement faucet for any Aqua-Pure model, call 800-835-1919.

Water Boss MPD. The line has been discontinued, although some models may still be available in stores. Water Boss admits the product may leach lead, but argues that the filters are still in compliance with EPA standards. If you own this filter and want to order a non-leaded faucet, call the manufacturer, Touch-Flow Corp., at 818-843-8117; the part will cost \$24.99 -K.M.

Helpful hints: Filters can remove lead. Install calcite filters between faucets and any lead service connectors or lead-soldered pipes or install point-of-use filters, like reverse osmosis and distillation units. Make sure these systems are maintained and filters replaced on a regular basis. EPA does NOT recommend activated carbon filters, sand filters, and cartridge or microfilter filters - these do NOT reduce lead levels. When lead is a problem, water softeners should not be connected to pipes leading to drinking water taps.

Moonshine

Automobile radiators, containing lead-soldered parts, are sometimes used to distill alcohol. Problem can result from the leaching of lead from solder used in radiators or the adjoining copper pipe during distillation.

Espresso Machines

Two machines, the Saeco Arome Noir (Aroma Nero) model, and the Brasilia Club model, leached lead above the level deemed acceptable under California's Safe Drinking Water and Toxic Enforcement Act of 1986, best known as Proposition 65. Exposures levels for chemicals listed under this law have a thousand-fold safety factor built in. Brass components often contain a high amount of lead in the alloy. As the hot water and espresso come in contact with the brass, lead is leached out into the beverage.

<http://www.cehca.org/consumer.htm#espresso>

Coffee Maker

About 100,000 Kenmore Coffee Makers were recalled June 2005 because they may leach lead. The coffee makers are manufactured by Chiaphua Industries Ltd. and distributed by Salton Inc. The Kenmore 12-Cup Percolators were sold exclusively at Sears department stores nationwide from July 2001 to April 2004. For more information, call the company at 800-233-9054.

PLASTICS

According to CDC, the use of lead in plastics has not been banned. It softens the plastic and makes it more flexible so that it can go back to its original shape. It may also be used in plastic toys to stabilize molecules from heat. When the plastic is exposed to substances such as sunlight, air, and detergents the chemical bond between the lead and plastics breaks down and forms a dust. <http://www.cdc.gov/nceh/lead/tips/toys.htm>

Vinyl products (Polyvinyl Chloride or PVC)

Lead is used as a stabilizer in PVC. When PVC is exposed to sunlight, it begins to break down and produce lead dust that can be inhaled or passed from fingers to mouth. Chewing on vinyl items can also expose us to lead.

- **Vinyl bibs**
- **Vinyl lunchboxes**
- **Vinyl backpacks**
- **Vinyl pencil cases**
- **Telephone cords**

- **Vinyl-coated electrical wires**
- **X-Mas light wires and artificial trees**
- **Shower curtains**
- **Rain jackets or boots**
- **Vinyl records** I tested one vinyl record in September 2012 and the reading was just over 500 ppm lead.
- **Bounce Houses** (also called jump houses or inflatable jumpers)

The Center for Environmental Health (CEH) tested bounce houses for lead. Those made by several companies contained high levels ranging from 5,000 parts per million (ppm) to 29,000 ppm. Federal limits on lead in children's products are 90 ppm for painted surfaces and 100 ppm for all other parts. CEH and California Attorney General filed a lawsuit against leading makers, distributors and suppliers in August 2010. In a February 2011 settlement, two companies agreed to limit lead in their future bounce houses to no more than 100 parts per million. <http://www.ceh.org/making-news/press-releases/29-eliminating-toxics/512-leading-bounce-house-makers-agree-to-strict-lead-limits>

- **Imported miniblinds:** Millions of non-glossy vinyl miniblinds, that have lead added to stabilize the plastic in the blinds, are imported each year from China, Taiwan, Mexico, and Indonesia. Studies have found that over time the plastic deteriorates from exposure to sunlight and heat to form lead dust on the surface of the blind. The amount of lead dust that formed from the deterioration varied from blind to blind. When purchasing miniblinds, make sure the label states "new formulation," "non-lead formula," "no lead added," or "new! non-lead vinyl formulation." New blinds without lead should sell in the same price range as the old blinds at about \$5 to \$10 each. Older blinds, made before 1997, are especially suspect for lead.



http://cchealth.org/topics/lead_poison/pdf/miniblinds.pdf

- **Garden hoses:** Lead leaching into hose water can come from the vinyl (PVC) material used to make the hose or from brass nozzles on hoses. In sunshine, lead in hose water is a particular concern, as heat can cause hoses to leach even higher levels of lead. Because of an August 2004 settlement, hose companies have agreed to reformulate their products to reduce lead exposures below California's Prop 65 standard by 2007. In addition, any hoses that could cause exposures above the standard should carry a prominent warning label reading, "Do not drink water from this hose. Wash hands after use." <http://www.ceh.org/making-news/press-releases/29-eliminating-toxics/158-pressrelease16>

Helpful hints: When you buy a hose, choose one labeled safe for drinking. With any hose, flush it by letting the water run for a minute or so before you drink. Avoid purchasing vinyl items when possible or make sure box states that no lead additives were used. Wash hands after handling vinyl products.

From Consumer Report, May 2003:

SAFE FOR DRINKING (as labeled)

Gardener's Supply Co. 33-469

Teknor Apex Boat & Camper Self-straightening

Swan Marine/Camper

Better Homes and Gardens Kink-free

NOT SAFE FOR DRINKING (as labeled)

Colorite Plastics Mainstays Light Duty

Colorite WaterWorks Light Duty

Gilmour Flexogen 7169657

Swan Fairlawn Reinforced

Gilmour Flexogen 10-5805GY

Swan Heavy Duty Soft & Supple

<http://www.consumerreports.org/cro/health-fitness/get-the-lead-out-of-the-garden-hose-503/overview/index.htm>

NOT SAFE FOR DRINKING (not labeled)

Teknor Apex Light Duty

Teknor Apex Mainstays Medium Duty

Companion 7169022

Craftsman 7169612

Teknor Apex Heavy Duty

Craftsman 7169212

- **Pocketbooks and Wallets**

Lead in purses and handbags can come from vinyl and other faux leather materials, or from dyes and pigments used to color the products. <http://www.ceh.org> In 2009, HealthyStuff.org tested over 100 women's plastic handbags and detected lead in over 75% of the bags analyzed. 64% of the bags contained lead over 300 ppm - the CPSC's past limit for lead in children's products. Over half of the plastic handbags contain >1,000 ppm lead. <http://www.healthystuff.org/findings.091609.stuff.php>

- **Some children's toys (soft vinyl PVC products)**

Health Canada issued an advisory about soft vinyl plastic toys that could be sucked or chewed on by a very young child for prolonged periods of time on a daily basis, thus exposing the child to surface lead, if any. While some of these products were found to contain lead, the majority of the tested products were found to not have extractable lead that exceeded the international standard of 90 ppm lead. Beware of other vinyl items that children may chew, like keychain floats (used by boaters). <http://www.leadpoisoningnews.com/whatis.html>

- **Vinyl Siding:** According to the Vinyl Siding Institute (VSI), “none of the vinyl siding produced in North America is manufactured with lead, nor does it contain cadmium.” The VSI has instituted a certification process to confirm that manufacturers are meeting the ASTM standard which states, “Certified vinyl siding shall not contain elemental lead or cadmium or compounds of these materials other than traces incidental to raw materials or the manufacturing process.” When I asked how they were verifying that siding was lead free, I was told that they use a LeadCheck or similar swab test. When I suggested a lab analysis or XRF reading I was told that would be “overkill” since they were testing products that they were fairly certain had no lead. Hmmm, I’ll let you judge that one. Vinyl Siding Institute Info line: 1-888-FOR-VSI-1, or www.vinylsiding.org



The only other reference to the use of lead stabilizers in siding was as follows, “The principal metals from which stabilizers are made include tin, barium, zinc, calcium and, decreasingly, lead and cadmium.” No one is able to tell me when or if lead was used and when this practice ended.

<http://www.vinylinfo.org/pressmaterials/factsheets/glad.html#additives>

Helpful hint: To check your own siding, use a LeadCheck swab, available in hardware stores (\$25 for 8 swabs) but know that these tests are not 100% accurate; however, this is the same test used to certify a siding product. Imported siding may have lead. Look for this symbol to buy “certified” siding. For a list of certified products: <http://www.archtest.com/vsi/>

METAL ITEMS

Brass Items

Brass is a metal alloy meaning it is a mixture of more than one metal. Brass is made of copper and zinc. Lead is a natural contaminant in zinc because the two are mined together from the earth. Lead is also added to brass as a lubricant during machining resulting in lead on the surface of brass products. It was determined that a bath of 2:1 5% Acetic Acid (white distilled vinegar) to 3% Hydrogen Peroxide removed surface lead without pitting the brass. Dunk the brass item for 10-15 minutes, swirl, rinse. This process will also turn the brass a gold color. Wear gloves and use tongs. <http://www.realbeer.com/jjpalmer/Welding.txt>

- **Bells**
- **Candlesticks**
- **Car Keys**

Brass is a soft metal so lead is added to give keys more strength. Some keys have a silver-colored nickel coating over top the brass, but this wears away. Sucking on car keys is dangerous. Even handling car keys can leave lead on one's hands. Not all keys are brass – some are aluminum and are lighter weight.

Helpful hints:

- NEVER give keys to children as a toy or place keys in your mouth.
- Place plastic key covers over the tops of keys and handle just the covers.

- Wash hands well after handling keys.

- **Faucets and Fittings**

Sand-cast faucets and other plumbing components have traditionally been made from leaded red or semi-red brasses. The most common plumbing brass, C84400 (also known as 81 Metal or 81-3-7-9) contains nominally 7% lead. The most popular red brass, C83600 (85 Metal, 85-5-5-5), contains nominally 5% lead. Lead is added to plumbing brasses to improve machinability and ensure pressure tightness. Without the machinability enhancement made possible by lead, brass plumbing products could be prohibitively expensive due to very high machining costs.

Research shows that a combination of bismuth and selenium provides the same beneficial effect on machinability as does lead. In addition, pressure tightness and other casting characteristics of bismuth/selenium brasses were found to be virtually identical to those in conventional leaded alloys. Trace amounts of lead may still be present but in concentrations low enough to pass the requirements of NSF Standard 61 for most plumbing devices.

<http://www.performancemeter.com/10/f/sebiloy.html>

- **Musical instruments**

Stay clear of old brass mouthpieces.

Galvanized Metal Items

Galvanizing is the process of coating metal with zinc. Lead is found with zinc, as the two are mined together out of the ground. Higher grades of galvanized items contain less lead than lower grades.

- **Galvanized Fencing**

A galvanized fence was found to be the source of lead dust responsible for elevated blood lead levels in a child in Seattle in 2009.

- **Galvanized Bird Cages**

Birds can get lead poisoning by gnawing on galvanized cages.

- **Galvanized Closet Rods**

Metal hangers rubbing along the top of the rods over a period of time wear away all the paint and may start causing friction on the galvanized pipe. Small particles fall onto clothes, usually on the shoulder area.

- **Galvanized Pipes**

See Drinking Water below.

Pewter Items

Pewter is a metal alloy, which means it is a combination of more than one metal. Depending on its use, pewter may be composed of various amounts of tin, antimony, bismuth, copper, and/or lead. Over the years, these combinations have varied greatly. Through the mid 17th century, there were two grades of pewter: Fine pewter and Lay metal or trifles. Fine pewter was used for flatware - plates, chargers etc. and also for important flagons and for spoons. Its composition was approximately: Tin 96-98%, Copper 1-4%, Lead <1%, Bismuth <0.5%. Lay metal was used for hollowware - measures and similar utensils. This was supposed to contain at least 80% tin alloyed with lead. However analyses of hollowware yielded the following composition: Tin 60-70%, Lead 30-40%, Tin <1%, Bismuth <0.03%.

Today's Pewter alloy is comprised mainly of tin. To meet American Pewter standards, it must contain 92% tin. Older pewters are usually very dark gray with tarnishing (lead tarnishes easily.) Modern pewters don't contain enough metals that tarnish easily and seldom need to be polished.

<http://www.megalink.net/~sjcphp/Pewter.html>

Copper Items

- **Copper sinks**

Look for certified lead-free, mercury-free, arsenic-free sinks. Although copper is an element, it can be contaminated if the mined ore is not “washed” well or during the recycling process. *When recycled, copper can mix with the other metals that it may have been associated with. For instance: If copper wire is melted down, and the wire was originally used where the connections were lead soldered, there will be lead in the recycled copper unless significant and very expensive steps are taken to remove the lead. We are unaware that there are any governmental regulations that test imported sinks for lead and mercury. For your safety, please do your homework.* <http://aboutcoppersinks.org/>

Ask for documentation stating the purity of the copper and the breakdown of elements blended with the copper. The purest copper available for manufacturing is 99.9%. Arsenic should not exceed 40 parts per million. Lead maximum is 0.001%. Mercury maximum is 0.001%. <http://aboutcoppersinks.com/>

Machined Steel

Steel manufacturers add lead to steel when producing steel bars to make them easier to cut and shape. The steel bars are sent to machine shops, where machinists create screws, cogs, flywheels and other parts for machines. The most common use for the steel is in automobile parts. An estimated 3 million tons of leaded steel, mainly a grade known as 12L14, are used by the nation's 700 machine shops each year. Under a car or in an engine, for instance, threaded fittings and all the long rods with machined ends are made of machining steel. Leaded steel is a small percentage of all steels – approximately 3%.

Somewhere in history, lead became a key ingredient in steel that could be easily machined without rapidly wearing out cutting tools. Scientists found that tin, which is less toxic than lead, can have this same beneficial effect. Look for lead-free or green steel. <http://www.postgazette.com/healthscience/19990719steel1.asp>

Stainless Steel

Stainless steel usually does not contain lead. Stainless steel is mostly iron and contains at minimum 10% chromium to inhibit rust; Depending on the type of stainless steel, there can also be substantial amounts of manganese, carbon and/or nickel added.

- *Austenitic* or 300 series, stainless steels comprise over 70% of total stainless steel production. A typical composition of 18% chromium and 10% nickel, commonly known as 18/10 stainless, is often used in flatware. They are not magnetic.
- *Ferritic* or 400 series stainless steels are highly corrosion-resistant, but less durable than austenitic grades. They contain between 10.5% and 27% chromium and very little nickel, if any, but some types can contain lead. They are used for decorative trim, sinks, and automotive applications, particularly exhaust systems. They are magnetic.
- *Duplex* steels are a mixture of these two types and are used in the paper, pulp, shipbuilding and petrochemical industries. http://en.wikipedia.org/wiki/Stainless_steel

Surgical steel is a type of stainless steel. The husband of a jeweler reported that his wife “...has found some earring hooks she'd bought from a craft store to have a warning label on them stating the presence of lead.”

Be careful about lead solder. In 2003 in Canada, stainless steel liquor flasks were identified to have lead solder.

JEWELRY

Inexpensive Jewelry (trinkets, necklaces, bracelets, pins, metallic hair accessories, rings)

Inexpensive children's jewelry can contain high amounts of lead, which poses a risk if sucked or chewed on it. Lead may be in metal components, plastic components, enamel, or paint. Jewelry not intended for children can also contain lead and is not regulated as strictly. Lead tastes sweet and appeals to children. A survey of inexpensive jewelry - a range of items costing less than \$20 - found 70% contained lead! A similar nationwide survey in Canada revealed that 66 of the 95 samples collected had a lead content ranging from 50% to 100%.

Ingesting even low amounts of lead may have harmful health effects on the intellectual and behavioral development of infants and young children.

The US recalled 150 million pieces of toy jewelry from vending machines in early July 2004 because half contained dangerous levels of lead. Action was taken after a four-year-old Oregon boy nearly died from swallowing a 25-cent pendant made with 39% lead. The recall was extended to Canada. In March 2005, a child died from lead poisoning after swallowing a charm off of a Reebok bracelet.

Items are available in a variety of shapes and sizes and may be metal plated or coated with enamel. These items are exceptionally dangerous if the coating wears off, is broken or scratched. Even handling leaded jewelry can be risky if children put their hands in their mouths without washing them.

I have tested Mardi Gras bead that were positive for lead. Keep these away from children and pets.

The Consumer Product Safety Commission limits the amount of allowable lead in children's products (for ages 12 and younger) to 100 ppm in paint or substrate. It is illegal to sell any item that exceeds this standard.

Cultural "Jewelry" worn to protect children

Amulets worn around the neck, wrist or waist in Cambodian, Vietnamese, Hmong and Laotian populations were found to contain lead. The protective charms are typically made of black or white string with several knots, metal beads or both. <http://californiawatch.org/dailyreport/amulets-linked-lead-poisoning-among-southeast-asians-8328>

CHILDREN'S PRODUCTS

A child's product is defined as one intended for use by a child age 12 or under. The CPSC limit for lead in a child's item is 100 ppm. The American Association of Pediatricians recommends that these items contain no more than trace amounts of lead, or 40 ppm lead.

<http://www.aap.org/en-us/advocacy-and-policy/federal-advocacy/Documents/ProtectingChildrenfromLead-TaintedImports.pdf>

Toys

Checkout www.cpsc.gov for the latest product recalls. Most toys recalled for excessive levels of lead were manufactured in China. Toys made of colored plastic or vinyl and painted toys are all suspect. Toys from other countries and painted antique toys may also contain lead. There can be much variation in toy lead levels, even within the same batch and lot. Since lead is heavy, if a toy is made of plastic, often the last ones poured will contain the highest amounts of lead. You can also check www.healthystuff.org for toy safety information.

Powder

In March 2000, testing revealed 10 powders to contain trace amounts of lead (up to three parts per million). The tests did not actually reveal the powders to be harmful to children, and several of these same companies also manufacture lead-free, unmedicated powders. The common denominator in all of the ones with detectable levels of lead is the active ingredient zinc oxide, added to treat rashes and minor skin irritation.

Because zinc oxide itself is frequently contaminated with lead, applying the medicated powders directly to the chafed, sensitive area of diaper rash may be of particular concern. Although lead is not significantly absorbed through the skin, it is a problem when ingested or inhaled. <http://www.ceh.org/making-news/24-lead-in-candy/136-viewfromthebottom-aremedicatedbabypowdersdoingmoreharmthangood>

The goal is for these companies to take the lead out. In the meantime, read labels and avoid powders that contain zinc oxide. The Center for Environmental Health reported the following baby powders that do and do not contain lead:

Powders with NO lead:

Diaparene Cornstarch Baby Powder
Johnson's Baby Powder
Johnson's Baby Powder with Aloe and Vitamin E
Longs Hypoallergenic Baby Powder
Walgreens Baby Powder

Powders WITH LEAD:

Ammens Medicated Powder	2.50 ppm
Caldesene Protecting Powder	2.40 ppm
Desitin Baby Powder	0.96 ppm
Dr. Scholl's Medicated Powder with Zinc Oxide	2.40 ppm
Gold Bond Medicated Baby Powder	3.00 ppm
Gold Bond Medicated Body Powder	0.63 ppm
Johnson's Baby Medicated Powder	0.54 ppm
Longs Medicated Body Powder	0.87 ppm
Mexsana Medicated Body Powder	2.80 ppm
Walgreens Medicated Body Powder	0.75 ppm

Imported Crayons

This is a good place to "buy American." So many Chinese crayons and chinks are contaminated with lead that it is impossible to buy them with any peace-of-mind. Be sure to check the small boxes of crayons given out by fast food restaurants and others; most of them come from China. Look for the CP or AP -- certified product or approved product -- seal, meaning that the product has gone through toxicological evaluation by medical experts and, according to the ACMI Manual of Procedures, contains no materials in sufficient quantities to be toxic or injurious to humans or cause any acute or chronic health problems.

<http://www.cpsc.gov/BUSINFO/6001.html>

Imported Colored Pencils

In Mexico, paint on the surface of colored pencils and the points themselves have been known to contain lead.

PET PRODUCTS

In 2008-2009, HealthyStuff.org tested over 400 pet products, including beds, chew toys, stuffed toys, collars, leashes, and tennis balls. No government standards exist for hazardous chemicals in pet products.

- 45% of pet products tested had detectable levels of one or more hazardous chemical.
- One-quarter of all pet products had detectable levels of lead.
- 7% of all pet products had lead levels greater than 300 ppm -- the old CPSC lead standard for lead in children's products. (The level is now 100 ppm.)
- Nearly half of pet collars had detectable levels of lead with 27% exceeding 300 ppm.
- One half (48%) of tennis balls tested had detectable levels of lead. Tennis balls intended for pets were much more likely to contain lead. Sports tennis balls contained no lead.

<http://www.healthystuff.org/findings.091609.stuff.php>

KITCHENWARE AND GLAZED PRODUCTS

Glass

• **Lead Crystal Glasses, decanters, pitchers, and beads**

Lead crystalware may release lead into the food and beverages it comes in contact with. The quantity which is released depends on the amount of lead in the crystalware, the type of food or beverage, and the length of time they are in contact with each other. Also beware of any exterior decorative pattern around the rim, such as a coating or glaze – these may release lead and cadmium.

Lead crystal is also called *crystal*, *flint glass* or *lead glass* and is a soft, fusible, lustrous, brilliant lead-oxide optical glass with high refraction and low dispersion. An Englishman of the early 1600's added lead oxide to molten glass, thereby increasing its luster, brilliance, and refractive potential. The lead made the glass optically denser (more resistant to light rays passing through it). The rays bent as they passed through the lead glass, creating spectrums of pure color and brilliant reflected light. Acidic juices & wines stored in leaded crystal will become contaminated with lead.

Swarovski crystal beads and components are leaded crystal. To be safe, these products should not be used for children's jewelry, although the company's tests show that lead is not easily released. Items advertised as *lead crystal* have 30% or more lead contained within the crystal. Anything below that amount can just be advertised as *crystal*. <http://www.beadboard.net/lead-swarovski-crystal-beads/>

Helpful hint: Never store liquids in lead crystal glasses or bottles, drink from lead crystal on a daily basis, (especially if you are pregnant!), or feed an infant or child from a lead crystal baby bottle or cup. Wash your hands after handling crystal beads and before you are in contact with small children or are involved in food preparation. Here are steps you can take to reduce your exposure:

- Use crystalware only when serving.
- Store food or beverages in lead-free containers.
- Soak new crystalware in vinegar for 24 hours and rinse it thoroughly before you use it.
- Wash crystalware by hand using a mild detergent; dishwasher detergents can damage the surface of the crystalware, causing more lead (and cadmium, if present) to be released the next time it is used.
- Use lead-free tableware when serving children or pregnant women.
- Eat a balanced diet that includes calcium, iron, protein and zinc; good nutrition will help reduce the amount of lead and cadmium your body absorbs.

If you are concerned about your exposure, ask your doctor about a blood test to measure how much may be in your body. <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/crystal-cristal-eng.php>

Painted Glassware

Almost 100% of all painted glasses I have tested are positive for lead-based paint – even new beer glasses. If logos are near the mouth of the glass, do not use. If the design is intact, the risk of handling these while eating seems small but be careful and get rid of any with chipping or worn paint.

Glazes

FDA regulates the amount of lead this is allowed to leach out of pottery. Food-safe glazes may meet federal standards but not necessarily be free of lead. The best way to test dishes is a laboratory leach test. LeadCheck swabs are helpful but not sensitive enough to determine if lead levels meet California standards.

Lead is used in some hobby and artists ceramic glazes because it allows glazes to mature at lower kiln temperatures, to fire properly in kilns without precise firing temperatures, to prevent cracking, to provide certain colors not otherwise attainable, and to withstand repeated dishwasher use. Thus, lead provides a high quality glaze. "Food safe" glazes containing lead, if fired to cone 06 (1,830 degrees Fahrenheit) or higher, will comply with the FDA safety requirements for lead release from finished articles. To assure that glazes initially labeled

as food safe continue to be so, manufacturers test the lead release of articles finished with these glazes before every formula change, then periodically using the FDA testing method. Glazes that are labeled as food safe should not release lead over the limits established by the FDA standard for food safe.

However, lead-free glazes, including some food-safe glazes, have been developed for use in institutions and by consumers such as children who need a glaze that requires no precautions during its use. According to ACMI's toxicologist, lead-containing hobby glazes should be used only by individuals who are capable of following safe use instructions; if supervision is required (such as in elementary schools, hospitals, nursing homes, and mental institutions), non-toxic, lead-free hobby glazes should be used.

<http://www.leadsafe.org/Parents/Sources/lead&art.html>

- **Bathtubs and Sinks:** Bathtub glaze may contain as much as 88% lead. As late as 1995, some manufacturers were continuing to use lead in the glaze for their cast iron, porcelain, and steel enamel tubs. If the enamel finish is cracked or worn down, lead dust may be produced or lead may leach into bath water. The glaze in sinks can also contain lead which may come in contact with food, toothbrushes, and utensils.

Helpful hints:

- Wash dishes in a separate wash tub or basin.
- Rinse dishes under running water instead of filling the sink with water.
- Shower children instead of bathing
- Avoid bathing in tubs with deteriorated, cracked, etched, or chalky glazing. Although lead is not absorbed through the skin, children may drink bath water - repair any chipped or worn glaze.
- Avoid using harsh abrasive cleansers on glazed surfaces
- When bathing, take shorter baths and avoid refilling tubs that have cooled with additional warm water. More lead can leach into water the longer it is in contact with the glaze
- Do not let children drink bath water
- If children must be bathed in an older tub, place a large plastic bin or container in the tub and fill the container with water instead of the tub
- Replace older tubs/sinks or refinish using acrylic liners or epoxy coatings and lead-safe work practices

<http://www.burlingtonvt.gov/uploadedFiles/BurlingtonVTgov/Departments/CEDO/Housing/Facts%20about%20Lead%20in%20Ceramic%20and%20Porcelain%20Glazes.pdf>

- **Ceramicware**

Since 1980, FDA has had limits on lead and cadmium in ceramicware products. The limits were lowered in 1991 to reduce consumer exposure to lead in food from ceramic dishes that may have lead glazes. Most ceramicware items sold in the United States meet current FDA limits because manufacturers tightly control the way they make dishes to minimize the potential for lead to leach into food.

Although most crafts people in the United States are very aware of lead issues and work hard to make their products lead safe, hand-crafted ceramics may pose a risk because of uneven quality control or the ceramics firing practices used. If you are concerned, talk to crafts people whenever possible about this issue.

Potential risk factors include:

- 1. China handed down from a previous generation.** These heirlooms were made before lead was recognized as a hazard.
- 2. Home-made or handcrafted china**, either from the U.S. or abroad, unless you are sure the maker used a lead-free glaze or high-temperature, commercial firing practices.
- 3. Highly decorated, multi-colored inside surfaces** (the part that touches the food and drink).
- 4. Decorations on top of the glaze instead of beneath it.** Can you feel the decoration when you rub your fingers over it? When you hold the piece at an angle to the light, can you see brush strokes above the transparent glaze surface? Has the decoration begun to wear away?
- 5. Corroded glaze** or a dusty or chalky grey residue on the glaze after the piece has been washed. **THIS TYPE OF CHINA COULD BE QUITE DANGEROUS. STOP USING IT AT ONCE.**

Any combination of factors 1 through 4 deserves particular attention. Factor 5, which could indicate extreme danger, is fortunately quite rare.

Helpful hints: To avoid possible exposure to lead from ceramics and other tableware, do not store food in any dishes that may contain lead or in antiques or collectibles. Be wary of using food or beverages stored in highly decorated or metallic-coated tableware, particularly items made in other countries or by amateurs and hobbyists. Pregnant women should limit their use of lead-glazed mugs or cups for hot beverages, since lead is harmful to fetuses. Don't heat or microwave suspicious china. Many manufacturers of tableware maintain toll-free telephone numbers for consumers to call if they have questions about their product. To obtain a manufacturer's phone number, contact the information operator for toll-free numbers at (800) 555-1212.

<http://www.nsc.org/issues/lead/leadindishes.htm>

[Annieglass](http://www.nsc.org/issues/lead/leadindishes.htm) - (888) 761-0050

[Corning](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 999-3436

[Dansk](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) BY-DANSK

[Dudson Group \(USA\)](http://www.nsc.org/issues/lead/leadindishes.htm) - (919) 877-0200

[Homer Laughlin](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 452-4462

[Lenox](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 635-3669

[Mikasa](http://www.nsc.org/issues/lead/leadindishes.htm) - (866) MIKASA1

[Pfaltzgraff](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 999-2811

[Pickard](http://www.nsc.org/issues/lead/leadindishes.htm) - (847) 395-3800

[Portmeirion](http://www.nsc.org/issues/lead/leadindishes.htm) - (203) 729-8255

[Royal Doulton](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 682-4462

[Spode](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 257-7189

[Vietri](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 277-5933

[Villeroy & Boch](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 223-1762

[Waterford / Wedgwood](http://www.nsc.org/issues/lead/leadindishes.htm) - (800) 955-1550

Here is a 2010 news report on lead in dishes: <http://www.wthr.com/Global/story.asp?S=12465018>

The following brands claim to be lead free:

- **Homer Laughlin China Company (USA):** Says they began to produce lead-free china in the 1980s.
- **Denby (England):** Claims "No lead or cadmium is used during the manufacturing process ..."
- **Hartstone Pottery (USA):** States "all body, glaze and paint raw materials are lead and cadmium free."
- **Sengware (USA):** Says it is 100% lead and cadmium free.
- **Terra Keramik (Switzerland):** Says it contains zero lead and cadmium.
- **Emile Henry (France):** States that "there is no lead or cadmium in our products, all of the glazes meet California [Prop 65](#), and all of the products are 100% food safe."
- **Apilco and Pilluvuyt (France):** Also supposed to be lead and cadmium-free.

<http://silvahayes.hubpages.com/hub/Lead-and-Cadmium-in-our-dinnerware>

• **Imported Ceramics and Dinnerware:** Suspect ceramicware products entering the United States from other countries can be automatically held at Customs until the importer or distributor can prove that the products meet FDA requirements. Sometimes, however, individuals bring ceramicware items into the United States in personal baggage. These items may not be closely examined when they enter the country and may have a lead glaze or decoration that can allow high levels of lead to get into food.

If you ever see a label on a bowl or plate that says "Not intended for food use" or the Proposition 65 Warning, heed the warning. Almost all American and Canadian ceramics makers meet lead safety standards for glazes. In some imported ceramics from Mexico, China, Italy, Spain, India, Korea, Macao, Pakistan, Thailand etc., however, heavy lead leaching has caused severe lead poisoning. Even pottery labeled "Lead Free" has been shown to contain leachable levels of lead.



- **Glazed bean pots from Mexico**
- **Royal Norfolk plates**, made in China, with a Christmas design (holly berries and leaves) with gold trim on the edge have been found to contain lead. Some have removable labels. Some have no labels. FDA requires non-removable labels. These are sold in Dollar Tree stores.

Helpful hint: Before buying imported ceramics to be used for food and drink ask (1) the supplier, (2) the maker, or (3) Food & Drug Administration (FDA) about the product's lead safety (1-800-INFO-FDA). To have your ceramics tested for lead, contact a certified lab. LeadCheck Swabs, sold at Lowes, are inexpensive and helpful.

Ceramics from China should be certified by the China National Certification and Accreditation Administration which means the factory provided FDA with reasonable assurance that ceramicware produced in these facilities and exported to the United States will satisfy FDA action levels for leachable lead and cadmium..



Retail cartons should bare this sticker: Actual Size, Approximately 15mm, Blue on White "H" Sticker/Logo with Unique Factory Code. For a current (5/05) list of certified ceramicware factories in China: <http://vm.cfsan.fda.gov/~comm/ceramic.html>

- **Ceramic Tile:** Some glazes on ceramic tile (floor, wall & ceiling tiles) were found to contain lead. Glazes were generally made with white lead and mixed with finely ground metallic oxides that provided the color. Colors included yellow from lead and antimony! These tiles were produced from many different countries around the world. <http://www.leadpoisoningnews.com/whatis.html>

TOBACCO PRODUCTS

Tobacco, Cigarette Smoke, and Ash

Lead is present in tobacco and gets into the air during the burning of the cigarette. The most common way lead gets into tobacco is through arsenate pesticides. A cigarette contains between 0.017 and 0.98 micrograms of lead. (Timbrell JA, 1995; Williams F, Robertson R, Roworth M., 1999) Approximately 5% of this lead may be inhaled; the remainder occurs in the ash and side-stream smoke (Mussalo-Rauhamaa et al., 1986).

http://www.seriaz.org/downloads/Lead_info.pdf#search='lead%20poisoning%20pipe%20organ'

Lead-210 and polonium-210 are poisonous, radioactive heavy metals shown to be present in tobacco smoke. When uranium, an ore that occurs in small amounts in nature, breaks down, radium is released as radon gas into the atmosphere. Radon gas decays quickly, producing lead-210 and polonium-210 - highly radioactive metals. Radium is also present in phosphate fertilizers often used in tobacco farming. As the radium in soil around tobacco plants releases radon gas, ultimately, the tiny lead and polonium particles float free, attach to bits of dust, and are carried to the surface of tobacco leaves. Because tobacco leaves are covered with thousands of fine hairs, these radioactive chemicals grab hold and stay put - from the field all of the way to the smoker's lungs. Lead-210 and polonium-210 are insoluble in water, so they are not removed during the cleaning and cigarette manufacturing process.

As a smoker breathes in cigarette smoke, lead-210 and polonium-210 "stick" to the cigarette tar that collects at the junctions of air passages within the lungs (bronchioles.) Studies have shown that lead-210 and polonium-210 build up at these locations within smoker's lungs and over time produce radioactive hot spots, increasing the risk for lung cancer. Because the build up of radiation a person receives over many years of smoking can be huge, researchers feel that lead-210 and polonium-210 in cigarette smoke are significant factors for lung cancer in smokers. <http://quitsmoking.about.com/od/chemicalsinSmoke/p/radioactivemetals.htm>

Helpful hints: Make a pledge to only smoke outdoors.

ANTIQUES

Antiques

- Painted furniture
- Painted window frames
- Painted or metal toys

- Die cast cars

The first die cast vehicles began appearing in 1934. The first die cast vehicles contained a lot of lead and were very easily broken. For this reason, manufacturers couldn't incorporate a lot of small details into the vehicles, they just had basic body style with empty interiors. Few of these survived. Eventually more life-like cars were created. The most common die-cast toys are scale models of automobiles, aircraft, construction equipment and trains, although almost anything can be produced by this method.



<http://www.tlcollectables.com/collecting-die-cast-cars>

- Brass or copper musical instruments
- Old metal ice cream scoops
- Lids of old salt shakers
- Old crayons
- Old pewter items
- Coins (We tested a 4th century Roman coin, AD 348, and found 84.5% copper and 11.7% lead)
- Old kettles

Some antique kettles may have been made with lead solder and will contaminate tea or water boiled in them because heat concentrates the effects lead.

www.southwestfairhousing.typepad.com/lead/



COMMON HOUSEHOLD ITEMS

Candles with metal in wicks

Lead can be absorbed by inhalation during the burning of candles with lead core wicks.

Not all candles are made with wicks that have metallic cores. The practice is primarily used with candles that are needed to burn longer such as scented or ceremonial candles. A metal core is used to provide rigidity to the wick which provides an even and slower burn rate, and to reduce the mushrooming at the tip. Since lead and its alloys melt at relatively low temperature, a large fraction of the wick core material is volatilized as the candle is burned.

Most candles containing lead core wicks came from the People's Republic of China. Candles made in Canada, United States, Mexico & Taiwan were also found to have lead core wicks but less often. Metal cores in Chinese candles were made of either pure lead or lead alloy. Metal cores made in the United States or Mexico consisted of zinc or lead-containing alloys. Lead was detected in small quantities in emissions from zinc-based wicks, suggesting that the lead may be a common contaminant in the zinc, wick or wax. The levels of lead were small, but still may represent a health risk over a long period of time.

Helpful hints: Discard candles with lead cores. Before buying candles and to allow you to make an informed purchasing decision, you should ask the retailer if they contain a lead core wick. For candles already in your possession, you can tell if they have a lead core wick by following three easy steps:

- Remove any wax from the tip of the wick.
- Separate the fiber strands from the wick to see if the candle has a metallic core.
- If the candle has a metallic core, rub the core on a piece of white paper. If the mark left on the white paper is grey in color, then the metallic core is probably lead.
- If you discover that your candle has a lead core wick, you should discard the candle using normal household garbage disposal procedures.

Curtain Weights

Chalk used for pool (billiard) cues

The colored chalk was found to contain between 5000-7000 parts per million lead, similar to the level in paint considered dangerous. Twenty different brands of pool cue chalk were evaluated and three brands were found to have elevated levels - Master Green, Pioneer Green and Pioneer tangerine. Children may be harmed by eating the chalk or cue-chalk dust deposited on surfaces within the house.

<http://www.svpl.org/Docs/CueChalkHazard.html>

Fluorescent Light Bulbs

Fluorescent bulbs contain toxic metals such as mercury, cadmium and lead. Unbroken lamps pose no threat to human health and the environment and may be managed as a universal waste. However, when fluorescent bulbs are broken, people may be exposed to toxic levels of mercury vapor and other metals which can be easily inhaled.

<http://www.dnr.state.mo.us/oac/pub1167.pdf#search='lead%20in%20photo%20processing%20chemicals'>

Incandescent light bulbs may contain lead in soldered bases (that silver dot at the bottom of the bulb) and glass at levels that exceed the hazardous waste limit. Other tests occasionally indicated incandescent bulbs also had cadmium levels at hazardous waste levels. <http://www.deq.state.mi.us/documents/deq-ead-tas-eleclamp.pdf#search='light%20bulbs%20contain%20lead'>

Helpful hint: Safely store bulbs and dispose of during hazardous waste recycling days.

Mirrors

Plate glass mirrors have long been made by wet chemistry processes involving polluting chemicals including lead. The lead-based paint protects the back of the mirror from being physically abraded by scratches and provides corrosion protection. The lead oxide pigment protects other layers.

Optical Glass (for lenses)

Because of its sophisticated processing and high lead content, lead crystal optical glass is more pure and radiant than lead crystal. Optical glass is unsurpassed in its ability to gather and transmit light. It is used in telescope lenses and in laser technologies, as well as in optic fiber cables that transmit light hundreds of feet even miles - with no loss of intensity. It is also sometimes used by sculptors. Some optical crystal is lead free.

Wine bottles

Lead seals (tin-coated lead foil capsules) were used on older wine bottles. FDA banned these capsules in 1996 after a study found that 3 to 4 percent of wines examined could become contaminated during pouring from lead residues deposited on the mouth of the bottle by the foil capsule. U.S. winemakers stopped using lead foils before the ban, but older bottles with the foils may still be around.

http://www.legallawhelp.com/safety_and_health/lead_poisoning/lead_dangers.html

Helpful hints: Remove the entire foil before using such wines. Then, before uncorking the bottle, wipe its neck and rim and the top of the cork with a clean wet cloth.

Grocery Bags

In 2010, certain bags sold in Winn-Dixie, Wegman's, and Publix stores had levels of lead that concerned health officials. The ones with the highest lead levels tended to have the most elaborate designs or illustrations that covered the entire surface. Lead was found to be in the paint, not the bag itself. I personally tested about 20 different bags locally and none contained lead.

MUSICAL INSTRUMENTS

Piano Keys

As the piano developed, the weight of the hammers increased in order to produce more volume. To keep the touch weight of the keys the same as it was in the instrument with light hammers, lead weights, usually cylindrical, were inserted into the piano keys. These are placed in the front end of the key when the touch weight is too large and in the rear end of the key, if the touch weight is too small. More lead weights are usually needed in the lower registers where the hammers are larger. To see these lead weights, depress a key in the low bass register and look at the side of the neighboring key, e.g. the wood part that is under the plastic or ivory key top. Usually you will see a number of small round lead weights embedded in the side of the key.

There may be exposure when key leads are changed or piano keys are leveled using these weights. Wear gloves when handling. Shaving key leads produces lead shavings. Wear respiratory protection.

<http://www.pianofinders.com/educational/touchweight-print.htm>

Organ Pipes

Harmonicas

I have found high lead levels in old harmonicas and suspicious results for some newer ones.

Kazoos (Metal)

HOUSING MATERIALS

Roofing and Prefabricated Building Materials

- **Metal Roofs, Metal Building material**

Metal roofs are made of steel coated with “galvalume” to prevent corrosion. Galvalume is 55% aluminum, 43.4% zinc, 1.6% silicon. After that, the roof is coated with a colored resin based fluorocarbon or fluoropolymer finish (paint), like Kynar or Trinar. Many prefabricated metal buildings are made using the same process as that for metal roofs. Lead may be present, depending on the color used and the manufacturer. Akzo Nobel’s paint chemist told me they try not to use lead in their paints but if a customer requests a particular color, lead pigments may be the only option. After discussion, if the customer gives the okay, leaded pigments will be used. Colors most likely to contain lead are bright yellows and oranges. Sometimes you’ll find lead in bright reds. Usually you will not find lead in earth tones like brown, black, grey, green, or barn red. Copper roofing was soldered with lead, probably still is. If you are unsure, find out who supplied the metal panels and ask the building/roof maker about lead content. (Akzo Nobel 614-294-3361)

That said, on the web is a company from England, Sharp’s Leadwork, that states “Established 2003, we are a relatively new company specializing in lead roofing and lead applications. We pride ourselves on using traditional methods to work the lead as well as embracing new technology. Our work comprises of sand-cast lead and milled lead applications.” Here is a photo of one of their workers without gloves.



- **Flashing**

Lead flashing is used around vent pipes and roof drains because it withstands hot temperatures. Lead-coated copper flashing as well as lead flashing is used around masonry.

- **Roofing nails**

Lead is used in the roofing nails that have the rubber washers. The heads of the nails are pure lead. The lead is soft and designed to flatten when hit to create a seal. These are used on metal roofs.

- **Gutters**

Some copper gutters are lead coated.

Sound insulation

Lead is a terrific acoustical barrier because it is limp and does not vibrate (much) and hence effectively blocks the sound as long as it is sealed airtight. There are some now made without lead but be cautious when removing any sound-proofing materials. There are many places you may find sound insulation: boat engine room soundproofing, RV campers, mechanical sound insulation, soundproof generator enclosure, recording studio room soundproofing, music studio room, theater, home applications between floor levels and rooms, acoustic insulation for machinery, trucks, vans, new construction, businesses, theater surround sound insulation, boat carpet underlayment, boat headliner, marine sound damping, pool pump room soundproofing and any place there's excessive sound levels.

- **Mineral Wool (or Rock Wool, Stone Wool)**

Mineral wool insulation (for heat or sound) or filtering material manufactured before 1970 may contain lead particles. "According to industry sources, lead slag is no longer used in the manufacture of mineral wool, although lead can be present as a trace impurity." <http://www.haz-map.com/leadfact.htm>

Caulk, Sealants

Old caulks may contain lead. These were used to prevent water damage on long seams, such as around windows, doors, sinks, tubs and showers. They can also be used to hide gaps in woodwork and fill long, narrow cracks in ceilings and walls.

Lead caulking is used in commercial construction building applications, most commonly in the joining or sealing of cast iron soil pipes. The lead used for this purpose must be liquefied. The process of heating the lead and applying it as a liquid presents an opportunity for exposure to lead-oxide fumes. The primary exposure to fumes occurs while dipping the ladle into the lead pot, carrying the ladle by hand to the solder area, and pouring solder into the pipe joint. Pot dressing is another source of lead fumes. Additional exposures to lead fumes can occur during repair and maintenance operations in which pipe joints are heated to melt the lead caulking and are then pulled apart. http://www.osha.gov/dts/osta/otm/otm_v/otm_v_3.html

Helpful hints: For lead pots, mount a portable local exhaust ventilation system directly on or near the pot to control lead fumes or install a thermostatic control device on the lead pot to prevent overheating to reduce the amount of lead fumes generated. During the repair and removal of cast iron pipes, disconnect the pipe by cutting it above and below the leaded joints to avoid lead exposure.

http://www.osha.gov/dts/osta/otm/otm_v/otm_v_3.html

Lead Putty and Putty Powder



This lead putty is 90% lead, but is soft, like putty. The manufacturer says, *Also useful as a fishing line weight or behind a golf club head. Marvelous stuff!* Yikes. Putty in general is a dough-like compound used to fill in holes (from nails for example) and for surface defects or open spaces. It is made of whiting (finely powdered calcium carbonate) and boiled linseed oil. Other substances may be combined with the oil to make putties suitable for some specific purpose. For example, red-lead putty is a compound made of red and white oxides of lead mixed with boiled linseed oil. This putty is used to seal pipe joints. White-lead putty is a combination of whiting, white lead or lead oxide, and boiled linseed oil. Putty hardens gradually when put in place, as along the edges of window panes to fasten them, in cracks in plaster walls, and in crevices in wood and other substances. The linseed oil absorbs oxygen from the air and, holding fast the calcium carbonate or metallic oxides, causes the mixture to harden. The putty can become very brittle over the long life and crumble and flake.

A powder composed of a mixture of lead and tin oxides, known as putty powder, is extensively used in polishing. Putty is generally being replaced in many applications by caulking materials of butyl and silicone rubbers. The higher cost of these materials is offset by their greater durability.

<http://www.infoplease.com/ce6/sci/A0840595.html>

Helpful hints: Buy non-lead-based putty.

Glass beads used for sandblasting

Abrasive blasting, commonly known as sandblasting—blowing various types of media out of a nozzle usually with compressed air—is a useful (and common) industrial technique for preparing surfaces for a variety of purposes. Small glass beads are one type of loose abrasive used with blasting equipment to prepare the surface. Small glass beads are used in a diverse variety of blasting applications, such as removing residues from automobile parts or calcium deposits from swimming pools. The blasting process is done in the open, within special containment facilities, or within blasting cabinets. Like any glass, the composition of these beads can vary.

Some glass beads have been found to contain toxic metals like lead and arsenic. This is a concern because the beads are typically pulverized during use and generate dust. Lead- or arsenic-containing dust can be inhaled or ingested, thereby exposing those performing the sandblasting, as well as other people in the vicinity. This dust can also easily be disbursed onto land or into air and water, potentially contaminating the surrounding environment and ultimately harming people and wildlife.

Starting January 1, 2011, California law (as found in Health and Safety Code section 25258) prohibits the manufacturing, selling, offering for sale, or offering for promotional purposes glass beads that contain more than 75 parts per million (ppm) of arsenic or 100 parts per million (ppm) of lead by weight if the beads will be used with pressure, suction or wet- or dry-type blasting equipment. These restrictions will sunset on January 1, 2015. For the full text of the bill read [Assembly Bill 1930 \(AB 1930\)](#)

[Health and Safety Code section 25258](#), also requires each container or bag of glass beads sold in California for surface preparation and that will be used with particular types of blasting equipment to be labeled with the following statement:

“Glass bead contents contain less than 75 ppm arsenic and less than 100 ppm lead pursuant to the California Health and Safety Code Section 25258.”

For questions about this law, please contact the Department of Toxic Substances Control at (800) 728-6942.

<http://www.dtsc.ca.gov/PollutionPrevention/ToxicsInProducts/GlassBeads.cfm>

SPORTING GOODS (Also see [Hobbies that involve work with lead or lead paint](#) for more.)

As of December 31, 2011, importers and manufacturers of children’s products that are subject to the lead content standard will be required to issue certificates affirming that their products have been tested by a CPSC-approved third-party laboratory.

The CPSC has also extended until 31 December the deadline to begin enforcing the lead content limits with respect to (1) certain component parts and materials of youth all-terrain vehicles, off-road motorcycles and snowmobiles, and (2) certain parts of youth bicycles, jogger strollers and bicycle trailers. The CPSC had been expected to begin enforcing these requirements on 1 May and 1 July, 2011, respectively.

In addition, the CPSC has delayed again, from 25 January to 27 November, 2011, certain testing and certification requirements for ATVs designed or intended primarily for children 12 years of age or younger. As with a previous postponement, this extension is being granted because there are still no accredited third-party conformity assessment bodies for youth ATVs.

Artificial Turf

The lead contained within an artificial turf's fibers does not pose a health risk to people unless the lead is released from the turf (mainly through deterioration over time into dust) and taken into the body. Researchers have discovered that after two to four years or more of wear and tear, some artificial grass can begin to release lead dust. Over time, artificial turf becomes increasingly weathered and worn, and the turf fibers may become abraded, faded or broken. As the turf fibers break down they create dust, and the lead in the dust becomes potentially more available for uptake. The main pathways of lead exposure from degrading artificial turf include ingestion (swallowing) from hand-to-mouth activity, and inhalation (breathing in) of dust that contains lead. Lead was found in grass made of nylon, polyethylene and mixtures of the two. Research found lead levels in breach of US legal safety limits at 12 out of 29 tested synthetic surfaces.



<http://www.atsdr.cdc.gov/HAC/pha/EasterSealsChildDevCenter/TundraTykesChildDevlpCenterHC02-03-2009.pdf>

<http://ehp03.niehs.nih.gov/article/info%3Adoi%2F10.1289%2Fehp.1002239>

Helpful Hints:

- Avoid contact
- Always wash children's hands after playing outside/on turf and before they eat or drink.
- Do not eat food or use pacifiers that have been dropped on the ground or on the artificial turf.
- Maintain one clean pair of shoes for indoor use, and reserve another set of footwear for outdoor/turf play.

Little League Belts

Independent testing commissioned by the Center for Environmental Health in 2011 found high levels of lead in some children's Little League baseball uniforms belts, including a Rawlings belt sold at Wal-Mart, and belts from Sports Authority and Dick's Sporting Goods.



AUTOMOTIVE PRODUCTS

Cars

- **Car body Paint**
 - Contaminated clothing of body-shop workers
 - Cars with deteriorating paint
 - Soil underneath these cars

- **Wheel Weights**

Lead wheel weights falling off cars and trucks is an unregulated source of lead pollution in the U.S. On average, cars and light trucks have up to 10 wheel weights that range from 1/2 inch to 6 inches in length and from 1/4 ounce to 4 ounces in weight. Recent studies have documented that on average 13% of wheel weights fall off vehicles during driving. One study estimates that 3.3 million pounds of lead per year are deposited on urban roads in the United States. Lead wheel weights are actually very soft and when they fall off a vehicle they are rapidly abraded by traffic into smaller pieces, scattered into the wind as dust, washed into storm sewers and waterways, and picked up by shoes, animal paws, and bicycle tires. Weights made of zinc or steel are being promoted as a safer alternative to lead.

In May 2009, a broad coalition of groups filed a formal petition asking EPA to ban the use of lead wheel weights in the U.S. starting January 1, 2011. Use of lead weights in Europe was banned in July 2005.

<http://www.leadfreewheels.org>

- **Lead-acid Batteries**

In 1990, lead-acid storage batteries, used for motor vehicles, motive power and emergency back-up power, accounted for 80% of total lead consumption in the US.

- **Used motor oil**

Used motor oil can contain toxic substances such as benzene, lead, zinc, cadmium, magnesium, copper, zinc, and other heavy metals which are picked up from the engine which can present a threat to health through skin contact, skin absorption, inhalation, or ingestion. Many of the problems associated with used motor oil are due to exposure to the heavy metals. These health problems are cumulative, so with each exposure to used motor oil the amount of heavy metals added to the body's system increases.

Helpful hints: Wear protective gloves; Store used motor oil away from children and sources of ignition. Place in a labeled container with a tight-fitting lid. Recycle used motor oil! Recycling removes metals. Do not put used motor oil in the trash, on the ground or down storm sewers, spray it on roads, or allow your car to leak oil. Do not burn used motor oil. When, burned, heavy metals quickly adsorb onto surrounding soil particles and contaminate the ground. Also, heavy metals and other contaminants can be released into the air, which may cause serious health and environmental problems. <http://youcan.toxicfreehomes.com/house1/motoroil.htm>

- **Radiators**

Lead exposure is a significant problem of radiator repair work, a small industry that is abundant in Mexico and other developing countries.

- **Gasoline for Closed-wheel racing cars, Piston-engine aircraft, Recreational boats, Construction equipment, and Farm machinery**

Lead was used in gasoline as a lubricant for engines. Lead was banned for use in gasoline for transportation on January 1, 1996. Because the above vehicles are considered "off road vehicles", they do not have to abide by the same gasoline restrictions as cars or "on-road vehicles". Although some use diesel fuel, others still use leaded gas or lead additive. Lead can be combined with organic chemicals to form lead compounds that are very different from metallic lead. The most common organic leads are alkyl-leads. Of these, the Tetraalkyllead compounds (Tetraethyllead [TEL] and Tetramethyllead [TML]) are the most common and have been used and are still in use primarily as a fuel additive to reduce "knock" in combustion engines.

Alkyl leads can enter our bodies when we breathe fumes or exhaust. Unlike metallic lead, alkyl leads can also be absorbed through the skin.

Lead particles can remain airborne for some time following the initial introduction into the atmosphere. Therefore, residents in the vicinity of race tracks and general aviation airports where leaded gasoline is still being used as fuel may have an increased risk of lead exposure. Similarly, spectators at racing events or air shows may also be exposed to alkyl-lead emissions resulting from fueling or to lead compounds emitted as exhaust. Information to quantify the risk of these exposure pathways is not currently available.

Aviation fuel attendants, mechanics, and racing crew staff are also potentially exposed due to inhalation of alkyl-lead compounds during fueling, evaporative emissions from spills, or evaporative emissions from unused gasoline remaining in the engine or fuel tanks. Further, these populations may be at risk because of possible dermal absorption of gasoline containing alkyl-lead compounds. Again information to quantify the risk of these exposure pathways is not currently available. <http://www.p2pays.org/ref/06/05724/>

- **NASCAR Fuel**

NASCAR fuel contained lead until January 2008. Attending races exposed fans to lead fumes. In December 2005, a draft EPA document titled *Air Quality Criteria for Lead* stated that leaded fuel may pose a serious risk to residents living in the vicinity of racetracks, fuel attendants, racing crew and staff, and spectators. For years, the EPA urged NASCAR to quit leaded gas voluntarily. The industry claimed it was trying to find replacements, but also insisted the ones that were available lowered performance and harmed engines. But in January 2006, under pressure from Clean Air Watch, a Washington, DC-based environmental group, NASCAR finally relented. The industry will use a lead-free fuel made by Sunoco called 260 GTX.

<http://www.ehponline.org/members/2006/114-5/focus.html>

ELECTRONICS AND EQUIPMENT

Medical Equipment

- **Radiation shields to protect against X-Rays**

There exist lead aprons, lead glasses/goggles, lead gloves, thyroid collars, gonad shields and other radiological protection devices. Other available equipment include lead curtains, mobile barriers, shelves and racks. Lead-free aprons are available, lighter in weight, and made up of a variation of metals: tin, tungsten, bismuth and antimony which absorb X-Ray photons better than regular lead vinyl.

From this website <http://www.bar-ray.com/>:

These no-lead aprons are environmentally-friendly and verified by the The Johns Hopkins University School of Medicine to provide 0.50 mm radiation protection levels. Available through select dealers only.

- **Electronic ceramic parts of ultrasound machines**
- **Intravenous pumps**
- **Fetal monitors**
- **Surgical equipment**

<http://www.haz-map.com/leadfact.htm>

Scientific Equipment and Personal Electronic Items

- **Electronic circuitry, Circuit boards for computers**

Lead is found in the surface finish/plating of electronic components and circuit boards, in plastic components, and in solder. In April 1993, the Lead Exposure Reduction Act and others were introduced in the U.S. banning lead for use in plumbing and housing but lead in electronic products was exempted! Today, lead-free electronic assemblies are only found in personal-use products, such as TVs, radios, cell phones, cameras, tape players, and computers but only in 5-10% of them! The technology is available but there are also economic and manufacturing issues to address. Some say lead-free items are more expensive and less reliable and that making lead-free high-end electronics, like ATM switches, servers, routers, automotive modules, and military weapons, is more questionable. Another option is to continue to use lead but implement electronics recycling.

On February 13, 2003, lead-free became a law in the European Union (EU), with an implementation date of July 1, 2006. From that date on, no electronic products (except those with exemptions) can be made in or shipped to the EU if they contain lead. Plastic ball grid array (PBGA), chip scale packages (CSP), flip chip, and wafer-level chip scale packages (WLCSP) are popular in consumer, computer and communication products. Most of these packages use solder as an interconnect material and will be affected by the lead-free regulations.

In the EU, there are two lead-free laws on “waste electrical and electronic equipment” (WEEE), and “restriction of the use of certain hazardous substances in electrical and electronic equipment” (RoHS). In brief, WEEE seeks to increase recycling and recovery of waste equipment. RoHS bans lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (HC), polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs).

In some products, lead is exempted by RoHS. For example, lead in solder for servers, storage and storage array systems; lead in solder for network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunications; lead in electronic ceramic parts such as piezoelectric devices; lead in high-melting-temperature-type solders such as tin-lead solder alloys containing more than 85 wt percent Pb. Also monitoring and control and medical equipment are not subject to the ban.

Although Japan has no lead-free laws, since 1998, Japanese manufacturers have been using lead-free soldering and technology in many popular lead-free consumer products such as MiniDisc players, refrigerators, cleaners, personal computers, notebooks, mobile phones, TVs, VCRs, PCBs and motherboards.
http://cgw.pennnet.com/Articles/Article_Display.cfm?Section=Archives&Subsection=Display&ARTICLE_ID=195252

Helpful hint: To recycle your cell phone, PDA's beepers, chargers, etc., call RiverLink, 828-252-8474, X110

- **Cathode Ray Tubes (CRTs) in TVs and Computer Monitors**

A CRT is used in most televisions and computer monitors (Liquid Crystal Displays (LCDs) and plasma displays do not use CRT technology). Lead is used in CRTs to protect users from potentially harmful exposure to x-rays. The lead in CRTs is bound in a glass matrix as lead oxide, and is stable and immobile. The average CRT used in 1995 to 2000, including televisions and monitors, is an 18.63-inch CRT with a lead content from 2.14 - 2.63 lbs. http://www.eiae.org/whatsnew/attachments/Lead_in_CRTs.pdf#search='lead%20in%20cathode%20ray%20tube%20s'

Military Equipment

- **Jet turbine engine blades**
- **Military tracking systems**

JOBS AND PAST TIMES

Occupations that involve work with lead or lead paint

Jobs that expose an adult to lead can also expose vehicles, homes, and others to lead through lead-dust-contaminated clothes, hair or skin.

- **Automotive body or radiator repairers**

Many painting jobs involve the application of a primer, base coat, and a clear coat. Typically, the base coat contains colored pigments and carrier solvents. The material safety data sheets listed these hazardous substances as components of pigments: chromium, nickel, antimony, and lead.

Workers involved in autobody repair can potentially be exposed to a multitude of air contaminants. During structural repair, activities such as sanding, grinding, and welding generate aerosols that are released into the worker's breathing zone. If the surface of the car being repaired contains toxic metals such as lead, cadmium, or chromium, exposure to these metals is possible. Workers who paint cars can be exposed to organic solvents, hardeners that may contain isocyanate resins, and pigments that may contain toxic components. During spray painting in autobody repair shops, workers are exposed to all of the paint components including metals such as lead and chromium.

The International Agency for Research on Cancer (IARC) has reviewed the health effects associated with painting operations. In the IARC publication, the term "painters" included workers who apply paint to surfaces during construction, furniture manufacturing, automobile manufacturing, metal products manufacturing, and autobody refinishing. After reviewing a wide range of publications, they concluded: "There is sufficient evidence for the carcinogenicity of occupational exposure as a painter." In addition, they noted that painters suffer from allergic and non-allergic contact dermatitis, chronic bronchitis, asthma, and adverse central nervous system effects.

<http://www.osha.gov/SLTC/autobody/docs/ectb179-14a/ectb179-14a.html>

<http://www.osha.gov/SLTC/autobody/docs/nioshctm/nioshctm.html>

Helpful hints: Wear a good, tight-fitting respirator to keep from inhaling lead dust. Use a P-100 or R-100 PARTICULATE filter, formerly known as HEPA (not the charcoal type, they are for organic vapors). Shave off the beard to get a good fit and get a fit-tested in your respirator. When you are shopping for a respirator, "N" means not oil proof, "R" means oil resistant, "P" means oil proof. N 95 is not sufficient for the fine dust. P100, or R100 is a better choice. P100 removes 99.97% of dusts, mists & fumes down to .3 microns in size. OSHA allows a half-face mask with P100's to be used for up to 10X the permissible exposure limit for an 8 hour day. An N95 filter is about as much protection as one of those filter masks sold for nuisance dusts. Even at that, a half-face respirator even with a P100 isn't sufficient protection at extremely high lead concentrations or if you burn or weld on metal that is covered with lead-based paint. Burning and welding breaks the lead into atom-sized particles at very high concentrations. Those operations may require a Powered Air-Purifying Respirator (PAPR)

or in some cases even supplied air or SCBA. None of this is worth a darn without a good face-piece seal.
<http://www.ytmag.com/cgi-bin/viewit.cgi?bd=pbwork&th=7975>

- **Battery breaking, recycling or manufacturing**
- **Brass or copper foundry work**
- **Bridge, tunnel, tower and ship work (where lead paint was used)**

Ironworkers, painters, laborers, and other construction workers may be exposed to lead during repair of bridges and steel structures. Workers need protection whenever they disturb or remove lead paint - when torch cutting, grinding, scaling, needle gunning, rivet busting, and cleaning-up. Workers are exposed by breathing in tiny airborne particles or by hand to mouth activities, like smoking or eating.

OSHA has estimated that over 5000 bridge repainting and rehabilitation projects involving lead exposure will occur each year (Federal Register, 1993). In addition, exposures greater than 400 times the current OSHA Permissible Exposure Limit (PEL) for construction have been documented during torch burning and abrasive blasting - activities common to bridge rehabilitation and demolition work.

Owners and contractors must ensure the health and well-being of workers, their families, the community and the environment. Reliance on regulatory enforcement *alone* is wholly inadequate since: 1) enforcement is scarce relative to the large volume of work underway, and; 2) compliance approaches often identify problems *after* harmful exposures have already occurred. Therefore, contracts should include specifications on the use of protective work practices and controls and the selection of a qualified contractor. Costs and enforcement are the responsibility of the owner.



<http://www.cdc.gov/elcosh/docs/d0500/d000562/d000562.html>

- **Building renovation and demolition work**
- **Cable repair**
- **Ceramics and jewelry making**
- **Chemical industry**
- **Closed-wheel auto racing**
- **Drivers who spend much time on heavily-traveled major highways**
- **Electrician**

Case Study: An electrician habitually chewed on the plastic insulation that he stripped off the ends of electrical wires. Samples of the copper wire with white, blue, and yellow plastic insulation were obtained and analyzed for lead content. The clear plastic outer coating (present on all colors of wire) and the copper wire contained no lead; however, **the colored coatings** contained 10,000-39,000 ug of lead per gram of coating. On receipt of these results, he was instructed immediately to discontinue chewing the wire coating.

- **Firing-range instructors and Police Officers**
- **Foundry work**
- **Gas-station attendants**
- **Gasoline additives production**
- **Lead abatement work**
- **Lead mining, smelting and processing**
- **Machine manufacturing**
- **Paint, pigment or shellac manufacture**
- **Plastics industry**
- **Plumbing/pipe fitting**

Putty is cementing material made of whiting (finely powdered calcium carbonate) and boiled linseed oil. Red lead putty is a compound used for caulking pipe joints, made of red lead, white lead, and boiled linseed oil. Red-lead putty is used as luting on pipe fittings.

- **Pottery workers**
- **Printing**

Many components contain hazardous materials:

Etch baths for making printing plates may contain hydrochloric acid, nitric acid, and heavy metals;

Solutions used in platemaking film processing may contain silver, lead, chromium, cadmium, toluene, chloroform, and methylene chloride;

Printing inks may contain a variety of toxic metals, such as chromium, lead, and cadmium, along with hydrocarbon solvents, plasticizers, barium-based pigments, and acrylic copolymers;

Cleanup washes may contain ethyl alcohol, benzene, toluene, xylene, methyl ethyl ketone, perchloroethylene, carbon tetrachloride, and kerosene. <http://www.greenbiz.com/toolbox/printer.cfm?LinkAdvID=4204>

- **Recycling operations**
- **Rubber industry**
- **Scrap metal industry**
- **Shipfitters**

A 2001 study found that shipfitters working aboard ship are overexposed to lead. Recommendations include substituting lead based paint with less toxic materials if feasible, avoiding the use of lead-based putty.

- **Soldering of lead products**
- **Solid waste production**
- **Stained-glass makers**
- **Welding/metal working**

All welding processes produce fumes and gases to a greater or lesser extent. For example, galvanized steels will produce added fumes from the vaporized zinc coating. Fumes from welding galvanized steel can contain zinc, iron and lead. Fume composition typically depends on the composition of materials used, as well as the heat applied by the particular welding process. In any event, good ventilation minimizes the amount of exposure to fumes. Prior to welding on any metal, consult ANSI/ASC Z-49.1, *Safety In Welding, Cutting and Allied Processes*, which contains information on personal protection, the general welding area, ventilation, and fire prevention.

Dentist

Is lead in fillings? Not since the late 19th century as scientists became aware of the harmful effects of lead, and dentists wished to avoid giving people lead poisoning. In the 18th century Pierre Fauchard recommended the use of lead as a filling material because it was soft, malleable, and easily compressible. But it is reported that lead was rarely used in the 19th century because it was so soft that it was quickly worn-down by chewing and had harmful health effects, which were known at that time. The concern was that the lead would be decomposed by the secretions of the mouth and enter the stomach, where it would adversely affect the patient's health.

http://www.ehow.com/about_5210060_history-dental-fillings.html

http://www.fauchard.org/history/articles/jdh/v46n2_july98/dental_fillings_jdh_98_46_2p71.html

In order to save money, production of crowns, bridges and dentures may be outsourced to India, Mexico and China. The dental community is concerned that unsafe metals may be used. Currently, FDA regulations require laboratories that are outsourcing work overseas to disclose that to their dentist, but that disclosure does not have to be passed on to the patient and sometimes labs don't tell dentists, leaving them to unknowingly place foreign products in patient's mouths.

http://www.10tv.com/live/contentbe/EPIC_shim.php?story=sites/10tv/content/pool/200802/1544047925.html

Helpful hints: Dentists: give labs a form that would require them to disclose where their dental work is made. Patients: Ask your dentist where their work is made.

Patients are at risk for exposure to a substantial amount of lead during a dental radiograph procedure if the office stores dental intraoral radiograph film in boxes with lead oxide (a white powder). These protective boxes were used to stop the release of radiation. Advances in dental radiograph technology have made lead-lined radiograph storage boxes unnecessary. Because lead oxide cannot be removed adequately, the film packets stored in lead-lined boxes and the film packets stored in them should be discarded.

Lead foil, dental bite wings, and discarded lead shields contain lead. Dental trap filter wastes contain lead, silver, mercury. Fluoride treatment chemicals may have lead, arsenic, or toxic industrial by-product contaminants.

In the Middle East, isolated cases of lead poisoning from the use of dental powders such as Saoott and Cebagin, which can contain as much as 51% lead, have been reported ([Abdullah 1984](#)).

Hobbies that involve work with lead or lead paint

Hobbies that expose an adult to lead can also expose vehicles, homes, and others to lead through lead-dust-contaminated clothes, hair or skin.

- **Air rifle pellets**
- **Antique furniture restoration**
- **Boat building**
- **Bronze casting**
- **Casting lead fishing sinkers, shot or pewter**
- **Copper enameling**
- **Fishing**



Never put a lead sinker in your mouth or bite down on slip shot - use a pair of pliers instead! Wash your hands thoroughly after handling lead sinkers or cleaning out your tackle box. Consider using a non-lead alternative. Maine, New Hampshire, New York and Vermont have banned the use or sale of lead sinkers in recent years and Massachusetts prohibits their use in certain key wildlife

areas.

Sinkers, including split shots, are now available in less toxic compounds such as tin, bismuth, and tungsten. Ask your local tackle shop/retailer to carry non-lead alternatives.

Several species of water birds are vulnerable to lead poisoning from the accidental ingestion of lead fishing sinkers. Specifically of concern are those that feed in shallow waters, such as bay diving ducks, surface feeding ducks, sea ducks, wading birds (cranes, herons, bitterns, and egrets) and shoreline feeders (geese and brants).

If you manufacture lead fishing sinkers, jigs, or spinnerbaits at home, you may be exposing yourself and your family to lead. Lead, when melted, can produce airborne particles that can move around your house and can cover everything—soil, dust, walls, floors, furniture, clothing, toys, stuffed animals, etc. While the best solution is to not manufacture at home—at a minimum, keep children's toys out of work areas, set up your shop in a building that is detached from your house, shower and change clothing, especially shoes which can carry



lead dust, before

entering a home where children live, work in a well-ventilated area, use a fume hood with a micron filter while working with lead to capture small lead particles, wear a respirator mask with a filter, keep your work area clean, clean the floors and walls with a household soap or detergent and water to reduce the amount of lead dust.

Helpful hints:

Minnesota Pollution Control Agency maintains a list of 36 companies offering lead-free tackle—weights of all shapes and sizes that are made without toxic lead.

<http://www.pca.state.mn.us/index.php/living-green/living-green-citizen/household-hazardous-waste/get-the-lead-out/get-the-lead-out-manufacturers-and-retailers.html>

According to Mark Pokras at Tufts University, “Iron & steel, ceramic, and natural stone sinkers are probably among the safest alternatives. They are available online at <http://stone-ease.com/>, <http://www.pallatrax.co.uk/>. OR, just go to your local hardware store and buy a bunch of hex nuts of various sizes (make sure they are NOT galvanized) -- I've used them as fishing weights for years and they are cheap and functional.”

- **Glass blowing with leaded glass**

- **Indoor and Outdoor shooting and hunting**

Since ammunition is often made of lead, those who frequent shooting ranges may be exposed to lead dust.

There are four ways lead is generated in the shooting range. The first and worst, because of particle size, is the primer that starts the powder ignition. It contains lead styphnate and other heavy metals that insure a proper and reliable ignition. The second, and second worst because of particle size, is the lead burn of the lead bullet tail of jacketed ammunition. The hot propelling gases result in atomization of molecular lead possibly the most dangerous because of great gas volumes if inhaled because of range eddy currents. The third is the lead particles spitting out of revolvers and barrel friction on all firearms. It results in varying size lead particles downrange of the firing line on the floor. The lead will be picked up by shoes and tracked elsewhere, where it may or may not be ingested. The fourth method, and the one that generates up to 95% of the particulate lead, is the lead bullet collision with the so commonly-used “hard” 30° to 45° incline steel traps. Best Management Practices to minimize the impact of lead on humans and the environment include:

- Use totally enclosed jacketed ammunition
- Use lead-free primers
- Install proper ventilation to assure adequate air movement and pressure in the breathing space and HEPA filter the air to be breathed
- Institute Range Operational Rules, only proper ammunition used, wash hands, etc.
- Eliminate lead dust generation at the bullet trap by proper choice of traps.
- Recycle whatever you use

<http://www.blackwaterusa.com/btw2004/articles/1101vargas.pdf#search='lead%20in%20ammunition'>

Here are more helpful hints:

1. A separate ventilation system exclusively for the range is recommended.
2. Only cast/fabricate lead bullets in workshops properly equipped to control lead exposure. These workshops should be staffed by trained craftsmen who know how to protect themselves from lead exposure.
3. Never dry sweep an indoor firing range. Wet-mopping or using a vacuum with a high-efficiency particulate air (HEPA) filter to remove lead particles, rather than dry sweeping, pouring or shoveling bullet debris.
4. Minimize airborne lead dust while cleaning the bullet trap. Where possible, debris trays should be emptied inside closed plastic bags. Debris should be repeatedly misted with water during all shoveling operations. New bullet trap designs which do not require cleaning are best and also save time.
5. Never eat, drink or smoke inside a firing range.
6. Wash hands immediately after shooting, cleaning firearms, picking up spent casing pellets or reloading ammunition. Wash hands, forearms, and face before eating, drinking, smoking or contact with other people.
7. Change clothes and shoes before leaving the firing range facilities.
8. Wash clothes or uniforms used at the firing range separately from your family's clothing.
9. Wear respirators and full protective outer clothing when performing range maintenance. Fit-tested NIOSH approved respirators with HEPA filters should be worn during all cleaning operations. Lead particles will pass through common paper dust masks.
10. Wear gloves and eye protection when using chemicals to clean weapons or firing range surfaces.
11. Have your blood lead level tested. If you work in a firing range, you can participate in your workplace bio-monitoring program to monitor blood lead levels.

<http://www.cdphe.state.co.us/dc/OH/shooting.html>

At outdoor ranges, inhalation of lead dust during the firing of guns is one pathway for lead exposure. Since lead is heavy, wind is unlikely to move lead particles very far unless there are significant structures that block air flow on the firing line. Under such conditions, the hygiene and other practices for indoor shooting ranges should be followed.

Range workers may also be exposed to lead dust while performing routine maintenance operations, such as raking or cleaning out bullet traps. Proper protective equipment or dampening the soil prior to work can help.

Another exposure route for lead is ingestion by direct contact with lead or lead particles. For example, lead particles can collect on the hands of a shooter and can be ingested if a shooter eats or smokes prior to washing his/her hands after shooting.

http://www.epa.gov/region2/waste/leadshot/bmp3_7.pdf

In 2004 a world conference was held to discuss the issue of lead in ammunition. The major conclusion of the conference was while lead in ammunition can pose risks in certain environments, these risks can be managed using simple and practical techniques. It was also recognized that the search for effective alternatives must continue. http://www.wfsa.net/Environment_Index.htm

- **Lead soldering of electronics or jewelry**

Lead-based solder exposes users to lead through inhalation. For this reason, the solder industry, as a whole, is moving towards reducing and eliminating lead and replacing it with other metals.

- **Lead lighting**

- **Model Derby cars**

Many use lead wire and lead putty to add weight to the cars.

- **Pottery with lead glaze and paint**

- **Print making and other fine arts**

- **Remodeling/renovations**

- **Radiator repair and maintenance**

- **Stained glass**

- **Welding**

Helpful hints: Always remove contaminated clothing and shower before entering living or eating areas or places where children may be present. Always keep children out of work areas.

FOODS, SPICES, REMEDIES, VITAMINS, SUPPLEMENTS, BEAUTY PRODUCTS

Products from Asia

- **Chinese Herb Products**

Lead is a contaminant in soil. Chinese herb products have some level of contamination reflecting the lead taken up by plants and animals, but certain products appear to become significantly contaminated mainly during manufacture in China, particularly in Hong Kong. The excessive lead in those products may come from intentional addition of substances that have elevated lead levels, concentration of lead in the original materials by making dried extracts, and contribution of lead from contaminated water and contaminated facilities. Efforts are being made in China to reduce lead contamination, including cleaning up drinking water and eliminating lead in gasoline, as well as improving manufacturing procedures at the herb factories. One can expect the lead contamination of herbal materials to decline in the future. A timetable for reduction of lead levels in Chinese herb products has been proposed that is consistent with available data about current lead levels and reasonable expectations for reductions in the lead content of soil, water, plants and animals.

<http://www.itmonline.org/arts/lead.htm>

- **Ayurvedic Medicines**

Ayurveda is a traditional form of medicine practiced in India and other South Asian countries. Ayurvedic medications can contain herbs, minerals, metals, or animal products and are made in standardized and nonstandardized formulations. Lead, mercury and arsenic have been found in such medicines. Several ayurvedic and other traditional medications do not contain lead; however, lead content has ranged from 0.4 to 261,200 ppm in certain common ayurvedic preparations. Certain branches of ayurvedic medicine consider heavy metals to be therapeutic and encourage their use in the treatment of certain ailments. The practice of *rasa shastra* combines herbs with metals, minerals, and gems. A 2008 study on metals in Ayurvedic medicines found *One-fifth of both US-manufactured and Indian-manufactured Ayurvedic medicines purchased via the Internet*

contain detectable lead, mercury, or arsenic. <http://jama.ama-assn.org/cgi/content/short/300/8/91>, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5326a3.htm>

Because imported Ayurvedic medicines are sold as dietary supplements, they are regulated by the Dietary Supplement Health and Education Act, but unlike drugs, are not tested for safety.

- **Spices and ceremonial/religious powders from India**

In March 2010, researchers at Children's Hospital Boston and the Harvard School of Public Health tested imported spices and food products in 15 Indian specialty stores and found a quarter of the samples contained more than 1 microgram of lead per gram and more than half of the ceremonial and religious powders also contained lead. The study, published in the journal *Pediatrics*, was conducted after the lead poisonings of Indian children were linked to Indian spices. In addition to finding lead in 25 percent of spices sampled, researchers found that, on average, imported spices contain double the amount of lead in U.S. spice brands.

The FDA has different thresholds for allowable levels of lead in food products based on how often a product is likely to be used. Last summer, the [FDA updated its guidance on lead likely to be consumed by small children](#), significantly lowering the recommended maximum level. The FDA does not have specific guidelines for screening lead in imported spices.

<http://www.foodsafetynews.com/2010/03/spice-regulation-facing-renewed-scrutiny/>

<http://children.webmd.com/news/20100315/lead-risk-lurks-in-spice-rack>

- **Surma**, also known as kohl, is a powder and is used cosmetically and medicinally. Surma use has persisted especially in the Northern Indian subcontinent, for both medical and mascara-type cosmetic traditions, and is likely to induce lead poisoning in some children. Surma is available as fine powder or heavy crystals of mineral lead sulfide containing 34-90% lead w/w. The color varies from shining deep black to dull gray brown. In some market samples, adding talc and other ingredients may reduce the lead content to 1%. Eye rubbing and finger licking could be the crucial factors in inducing lead poisoning in surma-using children. Beware of imported mascaras.



Surma and Kohl

- **Sindoor (Sindur)** is a substance sold in Indian food and novelty stores and in some convenience stores. It is an orange or red powder used in traditional Indian ceremonies and symbolic practices. Sometimes it is applied to the face or to the scalp of the head as a marriage sign. Some people use Sindoor to give foods like meat or rice an orange or red color. This product contains very high levels of lead that if ingested could cause lead poisoning. A March 2010 study showed some readily available sindoor powders contained 47%-64% lead. <http://children.webmd.com/news/20100315/lead-risk-lurks-in-spice-rack>

- Asian remedy for menstrual cramps, "**Koo Sar**" pills. Because lead is not listed as an ingredient of Koo Sar

pills, it is thought to be a constituent or contaminant of the red dye used to color the pills. The varying lead concentrations measured in different samples of the pills probably result from varying amounts of lead present during manufacture of the red dye.

- **Hindu folk medicine** - ground seeds and roots as treatment for diabetes (8 mg lead/g)

- **Daw Tway** is used as a digestive aid for young children in Burma and has been found to contained lead levels as high as 970 ppm, 200 times above acceptable limits, and 7,100 ppm arsenic. It comes as a brown pellet or powder and is applied to the tongue. Most of the product has been brought into the US by travelers returning from Southeast Asia or arrived via shipments from family and friends in that region. **Daw Kyin**, or *wonotsay*, a brown powder taken orally, also as a digestive aid has been found to contain arsenic levels as high as 23,000 ppm. It has been identified for sale in several Asian markets in the US.

http://www.in.gov/isdh/files/Arsenic_and_Lead_Poisoning.pdf

- In January 2008, Raja Foods recalled its 3.5 oz. (100 g) packages of **Swad Brand: Abil, Gulal, Kanku, Kum Kum, and Swad Brand: Lagan Samagri Kit, and Pooja Samagri Kit** because the product contains high levels of lead. These products were distributed through Indian grocery stores in Colorado, Georgia, Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, New York, Ohio, Oregon,



Tennessee, Texas, Washington and Wisconsin. These products are used in India for religious purposes and are intended to be placed on the skin or hair. Although the product was not intended to be sold for food use, its labeling may be confusing and may imply it may be used as food. Consumers with questions may contact the company at 1-800-800-7923 x 2860. http://www.fda.gov/oc/po/firmrecalls/raja01_08.html

- **Candies from China, Malaysia, Mexico, Pakistan, India**

For a list of all candies recalled in California 2007-2011:

<http://www.cdph.ca.gov/data/Documents/fdbLiCLiC07.pdf>

- **Kozhambu**

In August 2005, a family discovered their children were poisoned by a lead-contaminated mixture of spices called *kozhambu* (lead content: 310 mg/kg) while traveling in India. Both the parents and their 2-year-old child subsequently suffered lead poisoning. Families traveling abroad should be aware of the potential health risks associated with the purchase and use of spices that have not been tested for purity.

Products of West Africa

- **Calabash Chalk**

Calabash Chalk, found to contain lead and arsenic, is a West African remedy used to treat morning sickness during pregnancy. It is also known as *Calabash Clay, Nzu, Poto, Calabar Stone, Ndom, Mabele, Argile or La Craie*. It may be sold as large pellets or in bulk and can resemble balls of clay or mud. It may be packaged in a clear plastic bag with or without labeling.

Reported by Guilford County Department of Public Health 3/2010, 336-641-4556.



Products from Republic of Georgia

- **Swanuri Marili and Kharchos Suneli (Zafron)**

In August 2005, a family discovered their children were poisoned by lead-contaminated spices that were purchased in foreign countries, brought to the United States, and then used in the preparation of the family's food. Six children (2–17 years old) in a family from the Republic of Georgia were poisoned by swanuri marili (lead content: 100 and 2040 mg/kg in separately sampled products) and kharchos suneli (zafron) lead content: 23 100 mg/kg) purchased from a street vendor in Tbilisi, Georgia.

Products from Dominican Republic

Litargirio (pronounced “lee-tar-heario”) is a yellow/peach-colored powder that may contain up to **80% lead**. It is packaged and sold as a home remedy and is most frequently used as an antiperspirant/deodorant. It is also used for treating fungus on the feet, for burns, and for wound healing.

The product is made in the Dominican Republic and is believed to be bought and sold primarily within the Dominican community. It is sold in small clear packets (e.g. 2-inch by 3-inch packages are most common). Some botanicals may sell packages that do NOT contain a label. Powder that accumulates on hands or on surfaces can be accidentally swallowed or can be inhaled.

Helpful hints: Stop use. Thoroughly wash hands and any other exposed body parts that come into contact with the powder. Wash affected household surfaces with soap and water. Put any unused product in a sealed container or plastic bag. Contact your local sanitation department for instructions on safe disposal.

Children or pregnant/nursing women should be tested by a health care provider for lead poisoning if they have used this product. <http://www.ci.nyc.ny.us/html/doh/pdf/lead/litargirio-fs1.pdf#search='litargirio'>

<http://my.webmd.com/content/article/74/89422?src=Inktomi&condition=Drug%20Alert>

Products from Mexico

- **Candies from Mexico**

Because Mexico (like the US) used lead in gasoline for many years, soil often contains lead even today. If soil is not washed off of chilies well, lead from the soil can get into chili powder and into candies containing chili powder. Also, some Mexican candies wrappers contain lead in the ink.

For a list of safe candies: http://www.leadinmexicancandy.com/safe_candy.html

For a list of candies recalled in California: <http://www.cdph.ca.gov/data/Documents/fdbLiCLiC07.pdf>

The following have been recalled in California in 2007-11 for exceeding the FDA Lead Guidance for Industry: *This guidance provides a recommended maximum lead level of 0.1 ppm in candy likely to be consumed frequently by small children. FDA considers the recommended maximum lead level to be achievable with the use of good manufacturing practices in the production of candy and candy ingredients and to be protective of human health.*

<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/ChemicalContaminantsandPesticides/ucm077904.htm#>

BarriChicle Chewing Gum

Barrilito

Bibi rainbow Chewing Gum

Chaca Chaca

Chacatrozo

Dedos

Dulces Yosi Mega Pack Toys with Gum

Hola Pop!

Huevines Confitados Sabor Chocolate

Indy Mini Dedos Spicy & Sour

Jovy Shaiky Pop

Lucas Limon

Lucas Limon con Chile

Miguelitos

Pinta Labios

Tama Roca Banderilla

Tamanlorin/Tamarind Lollipop

Tamanzela, Chili-covered Lollipop

Tarritos, Liquid Candu Snack

Ticorindo

Candy brands from numerous countries are suspected of being contaminated with lead. Tests by the state's Department of Health Services dating back to 1993 found lead contaminants in 112 candies that exceeded state and federal guidelines. Although 85 are made in Mexico, American brands, including Hershey's chocolate, also tested positive for lead contamination.

For excellent report about lead in Mexican candies, in English and Spanish:

<http://www.ocregister.com/investigations/2004/lead/index.php>

For slide show about lead in Mexican candies, in English and Spanish:

<http://www.ocregister.com/multimedia/leadslideshow/>

- **Some Mexican chili powder** and Mexican candies made with chili powder. Some Mexican candies with leaded ink used on the wrapper. Latin American candy brands, widely sold in ethnic food stores, such as Pulparindo, Piño Loca, Vero Elotes, Duvalin, Pelon Pelo Rico and Pelata Ricorindo.
- Four **seasonings** imported from Mexico, Lucas Limon, Lucas Acidito, Super Lucas and Super Jovy Chili Powder, have been found to have levels of lead that pose a potential danger to children. The company debates the results and says that salt interferes with the lab methods used.
- **Mexico Herbal remedies** like Greta and Alarcon
- **Candies from China, Malaysia, Mexico, Pakistan, India**

For a list of all candies recalled in California 2007-2011:

<http://www.cdph.ca.gov/data/Documents/fdbLiCLiC07.pdf>

- **Achiote Negro**, a chicken rub, used in Mexico was found by the Guilford County (NC) Health Department to contain 19 ppm lead. This was reported to the FDA and the Health Department is awaiting action.
- **Dried Plums**

Dried Plum Products with Elevated Lead Levels September 30, 2009

NOTE: No other products from listed Manufacturers/Distributors are implicated.



Manufacturer/Distributor on Package

Product Name(s) on Package

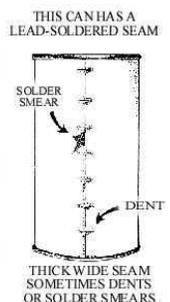
Alamo Packing	The Original Chinese Candy, Dried Plums with Pickle and Lemon, Saladitos Con Pepino Y Limon
Almax International	Its Fruit Chinese Style Dried Prune, Saladito
Bolner's Fiesta Products	Saladitos 6 Count
Casa De Dulce	Salted Plum Suckers
Cheung Fat	Plum wrapped "candy" (Packaging predominately in Asian foreign language – blue and white bag with candy wrapped in red and white)
Dollar Value Distributor	Saladitos, Salted Prunes
Hinojosa Brothers (H.B. Wholesale)	Salados, Salted dried plums
Kam Tai Houg	Hua Ho Ying Tzu (Packaging in Asian foreign language)
Little Gregory	Chinese Candy Packaging also contains individual packets of Limon & La Sabrozita
Mexican Products & Spices	7 Salted Plums, 7 Saladitos
Produce Plus	Saladitos Chinese Candy
Roxy Trading Co.	Preserved Liquoriced Prune (heart shaped box)
Roxy Trading Co.	Preserved Plums/Preserved Salted Prunes, Preserved Plums/Preserved Red Prunes
Sanh Yuan Enterprise	Preserved Fruit Pitted Prunes
Tang Hoi Moon	Chan Pui Mui Preserved Plum
Wan Tom Food Co. LTD	Ka Po Preserved Plum

www.dshs.state.tx.us/foods/

Other Food

- **Food stored, cooked, reheated or served in:**

- Lead-glazed ceramics or porcelain
- Leaded crystal or glass
- Imported cans with lead solder (particularly acidic foods such as pineapples, pickles and tomatoes)
- U.S. food canners voluntarily eliminated lead solder in 1991 and the FDA banned lead-soldered cans in 1995, requiring their removal from shelves by June 1996. Some countries still use lead-soldered cans for food, however, and these food items may still occasionally be imported, albeit illegally, into the United States. (Photo from: <http://www.lead.org.au/fs/fst3.html>)
- Lead-soldered samovar (urn) from Iran
- Painted glass
- Pots 'tinned' with a lead-tin mixture
- Brass with leachable lead levels
- Indian pressure cookers, especially from the rubber gasket and safety



- **Red wine and Balsamic Vinegars**

Environmental Law Foundation research in 2004 showed that all balsamic red wine vinegars contain lead above the *no significant risk* level. The very expensive *traditional* vinegars, which are aged a minimum of 12 years, had extremely high levels. California's proposition 65 now places warning labels on red wine and balsamic vinegars. It is thought that the lead is deposited on the skin of the grapes through air deposition (from burning coal, leaded gas). Grape skins are used to color the vinegars and then the vinegar is further concentrated, which also concentrated the lead. White vinegars did not test high.

- **Food prepared with the use of leaded-gasoline emissions** can deposit lead onto the food
- **Spices and food coloring** may be contaminated with lead from petrol emissions, lead pigments or painted storage containers. Be especially aware at festivals.
- **Food exposed to lead-arsenate pesticides or lead-containing fertilizers**
- **Root vegetables grown in contaminated soil**
- **Vegetable coated with contaminated dirt and not washed**
- **Leafy vegetables exposed to lead dust**

- Lead may be in **ink used to print candy wrappers or food labels**. Lead may leach into food or be consumed during the eating of the product.
- Lead uptake from **beer** in India, lead contamination in various **food colors**, lead content of food samples and **cereal products** have all been investigated and reported.
- **Lozeena**, an orange powder used in Iraq to color rice and meat, contains 7.8-8.9% lead.
- Imported **Hungarian paprika**
- In the Middle East, Spain, Turkey, Greece and Albania, **flour** from traditional stone mills reinforced with lead joints remains a potential source for lead poisoning. Lead fillings are used to secure the housing of the driveshaft to the millstone.

(<http://www.ncbi.nlm.nih.gov/pubmed/10926721>, <http://www.ncbi.nlm.nih.gov/pubmed/16082893>)

- **Juices**

- **Apple and grape juice:** In 2011, Consumer Report tested 88 samples of apple and grape juices. They tested one sample from each of three lots of the majority of the juices, most of which were made from concentrate in ready-to-drink packages (bottles or juice boxes). Some juice samples were made from concentrate that came from multiple countries, while others came solely from the United States or another single country. There's no federal limit for arsenic or lead in juice, so researchers compared results to allowable lead and arsenic levels in bottled water. In their tests, 25 percent of samples exceeded the 5-parts per billion (ppb) total lead limit for bottled water and 10 percent exceeded the 10-ppb limit for total arsenic in drinking water. <http://www.consumerreports.org/content/dam/cro/magazine-articles/January%202012/Consumer%20Reports%20Arsenic%20Test%20Results%20January%202012.pdf>

- **Milk**

- **Breast Milk:** The amount of lead that enters breast milk is a small percentage of what is in the bloodstream – approximately 3% or less. Women with past lead exposures or who smoke cigarettes may have higher amounts of lead in breast milk than those others. The CDC says that the benefits of breast feeding outweigh the risks unless a woman's blood lead level is 40 µg/dL or higher; however, for mom's with high blood lead levels, they and their babies should be tested regularly. The bigger concern is lead from blood passing through the placenta during the pregnancy.
- **Cow's Milk:** A 2002 Austrian study looked at lead in cow's milk and found 10 µg/L - far below the current recommendations of 30 µg/L. <http://pediatrics.aappublications.org/cgi/content/full/110/5/873>
- **Infant Formula:** According to the Austrian study cited above, Pb levels in breast milk are normally lower than in milk-based infant formulas. Another researcher in 1990 reported that heavy metal concentrations were usually in the same order of magnitude. Reconstitution of infant formulas with contaminated tap water appears to be the main reason for the higher Pb concentrations. Another reason cited is contaminated formula cans. <http://www.nrdc.org/breastmilk/lead.asp>
- Lead-lined and lead-soldered cans are no longer used for commercial infant formula produced in the United States, and a recent study confirms that currently marketed milk-based ready-to-feed infant formulas in the United States contain no appreciable amounts of lead. Only one sample of 88 contained any measurable lead (U.S. Food and Drug Administration 2007). To the extent that lead can be found in infant formula, the relative bioavailability of such lead may be less than that of lead in breast milk. <http://www.cdc.gov/nceh/lead/publications/LeadandPregnancy2010.pdf>

Helpful Hint: When reconstituting baby formula, use bottled or filtered tap water known to be lead free. If you are using tap water, test it for lead! Use only cold water and flush the tap for at least 3 minutes before use.

- **Candy:** Brands from numerous countries are suspected of being contaminated with lead. Tests by the state's Department of Health Services dating back to 1993 found lead contaminants in 112 candies that exceeded state and federal guidelines. Although 85 are made in Mexico, American brands, including Hershey's chocolate, also tested positive for lead contamination. http://www.detoxamin.com/health-news/imperil_health.html
- **Chocolate:** The lead present in chocolate products is likely to be the result of sloppy manufacturing

practices and poor raw materials purchasing practices by cocoa-producing companies. A great deal of scientific research points to the use of leaded gasoline, as well as lead and cadmium in pesticides and fertilizers, as likely sources for lead and cadmium in chocolate. The chocolate companies fail to take available steps to remove from their products both the natural and man-made sources of lead, such as those created by the use of alkalizing agents in making chocolate, or from the use of leaded gasoline, lead in pesticides and fertilizers in growing cocoa beans, or from lead in common dust that occurs in manufacturing plants and from transit vehicles. A 2005 study concluded that while cocoa bean shells may be one source of lead, most contamination occurs during shipping or processing of the beans and in manufacturing.

<http://www.ehponline.org/members/2005/8009/8009.pdf>

A 2005 study looked at cocoa beans, their shells, and soils from six Nigerian cocoa farms, and analyses of manufactured cocoa and chocolate products. The average lead concentration of cocoa beans was one of the lowest reported values for a natural food. In contrast, lead concentrations of manufactured cocoa and chocolate products were among the highest reported for all foods. One source of contamination of the finished products is tentatively attributed to atmospheric emissions of leaded gasoline, which is still being used in Nigeria. Because of the high capacity of cocoa bean shells to adsorb lead, contamination from leaded gasoline emissions may occur during the fermentation and sun-drying of unshelled beans at cocoa farms. However, the much higher lead concentrations and larger variability in lead isotopic composition of finished cocoa products indicate that most contamination occurs during shipping and/or processing of the cocoa beans and the manufacture of cocoa and chocolate products. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1281277/>

Helpful hints: Lead intake by 2-year infants from food (versus other sources like dust, water, soil, and air) decreased from 47% to 16% over a 4-year period in which there were marked reductions in the use of lead-soldered cans and lead-containing gas additives in the USA (Bolger et al., 1991). Similar decreases in other countries could occur if similar actions were taken.

Calcium Supplements and Bone meal calcium products

General concerns have been raised that calcium from natural sources could potentially contain lead in excessive amounts, in contrast to synthetic forms (e.g., calcium citrate) or refined calcium carbonate. Calcium supplements containing the highest levels of lead are often those being marketed as “all-natural”. Calcium supplements found to contain high levels of lead include calcium phosphate or bonemeal (made from bones, which are storehouses of lead) and “natural source” calcium carbonate, mined from limestone rock composed of fossilized oyster shells (which also store lead). http://www.detoxamin.com/health-news/gummy_vitamin.html

Helpful hint: Government statistics show that eight percent of all children age two to six years take an over-the-counter calcium supplement. So does one out of every four women. Each six micrograms of lead in a calcium supplement will translate into approximately one additional microgram of lead in a child’s blood-lead level. Families should carefully read labels and select a lead-free calcium supplement. Some sources of lead-free calcium include:

- antacids such as Tums® or Rolaids®;
- supplements manufactured to USP (United States Pharmacopeia) standards; and
- supplements manufactured to NNFA (National Nutritional Food Association) standards.

http://www.seriaz.org/downloads/Lead_info.pdf#search='lead%20poisoning%20pipe%20organ'

Gummy Bear Multi Vitamins

Although the producers debate the results, a lab reported that L'il Critters Gummy Vites was found to contain 2.5 mcg of lead per two gummy bear serving, an excessive amount for a children's vitamin. The opposing arguments can be found on www.consumerlab.com and www.gummybearvitamins.com. Until the dust clears, you'll have to make your own judgment. In May 2009, I was told by a gentleman who called Northwest Natural, the maker of these vitamins, that the company stated that the vitamins do contain some lead but that they met

Traditional/Folk Remedies (Remedios Caseros) or Cosmetics from other countries

Name	Region of origin	Lead level Nivel de Plomo	Medicinal use
Albayalde or albayaidle	Mexico, Central America	93%	Empacho (vomiting, colic), apathy and lethargy
Alarcon, azarcon, coral, luiga, maria luisa, rueda (red orange powder)	Mexico	95%	Empacho (see above)
Alkohol	Middle East	85%	Topical medical preparation; applied to umbilical stump
Al Murrah	Saudi Arabia	?	Colic, stomach aches, diarrhea
Anzroot	Middle East	?	Gastroenteritis
Ba Bow Sen	China	1000 mg/g	Hyperactivity and nightmares in children
Bali goli (round, flat black bean dissolved in "grip water")	Asia/India	?	Stomach ache
Bint al dahab, bint or bent dahab or zahab	Oman, Saudi Arabia, India	98%	Diarrhea, colic, constipation, and general neonatal use
Bokhoor (and noqd)	Saudi Arabia	?	Wood and lead sulfide burned on charcoal to product pleasant fumes, calm infants
Cebagin	Middle East	51%	Teething powder
Chuifong tokuwan	Asia	?	?
Cordyceps	China	414-20,000 ug/g	Herbal medicine treatment for hypertension, diabetes, bleeding
Daw Tway (brown pellets/powder)	Burma	≤ 970 ppm	Digestive aid (also contains high arsenic)
Deshi Dewa	Asia, India	12%	Fertility pill
Farouk	Saudi Arabia	?	Teething powder
Ghasard (brown powder)	India	2%	Given as a tonic; aid to digestion
Greta (yellow powder)	Mexico	97%	Empacho
Hai Ge Fen (clamshell powder sometimes brewed in tea)			
Henna	Middle East	?	Hair and skin dye
Herbal medicines (eg Poying Tan)	China	7.5 mg/dose	General
Kandu (red powder)	Asia/India	?	Stomach ache
Kohl, Surma or Saott	Africa, Asia, India, Pakistan, Middle East	Up to 86%	Cosmetic; astringent for eye injuries and umbilical stump, teething powder
Kushta	India/Pakistan	73%	Diseases of the heart, brain, liver, and stomach. Aphrodisiac, Tonic
Lithare, Minium (Ingredient in medicine)	Asia	Contain Lead Oxide	
Pay-loo-ah	Laos (Hmong)	90%	High fever, rash
"Santrinj"	Saudi Arabia	?	Teething powder
Xyoo Fa			Medicine
Unknown (Ayurvedic)	India, Pakistan, Sri Lanka, Burma, Bhutan, Mongolia, Tibet	1.35-72,990 ug/g per capsule, 3%	Metal-mineral tonic, Slows development

(Compiled by the NSW Lead Reference Centre, 1997 from "Lead is a Silent Hazard", 1994, pp 154-156 and assorted articles in the medical literature. Edited with information from Illinois Department of Public Health's Childhood Lead Poisoning Prevention Program, 217-782-0403)

FDA limits. Because this man's child had autism, the child was taking more than the recommended daily dose and was possibly exceeding those FDA limits. Check with manufacturers! Ask for lab results!

Vitamins in general

In 2007, scientists found lead contamination in some vitamins. The U.S. Food and Drug Administration (FDA) studies the issue and concluded that the lead in vitamins was at a level that did not pose risk to children, pregnant women, and other adults. Here is a link to 2008 lab results on a variety of vitamins marketed to children and women:

<http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/Lead/ucm115941.htm>

In July 2009, researchers criticized the way the FDA analyzed the risk posed by lead levels in vitamins. They argued that FDA used outdated assumptions and poor reasoning to declare all tested vitamins safe. To determine the amount of lead in vitamins considered safe, FDA based its decision on the amount that would cause someone to have a blood lead level of 10 µg/dL or above. It is now well accepted that lead can have harmful effects at blood lead levels below 10 µg/dL. The FDA also presumed a child's only exposure was to lead in food. The researchers recommended that the FDA reconsider their conclusions.

<http://www.ehponline.org/members/2009/0900573/0900573.html>

Kaopectate

Caplets: In 2003, the amount of lead was reduced in Kaopectate caplets. The caplets contained 25 micrograms of lead in every adult dose — 50 times the level at which the state requires a warning label. There were six to 12 micrograms in each child dose. The key ingredient in Kaopectate was attapulgite clay, which contained large amounts of lead. This was replaced with bismuth subsalicylate, found in Pepto-Bismol.

Liquid: The liquid form of Kaopectate was altered in 2001 when California sued. About 80 per cent of the lead has been removed from the liquid.

http://www.cbc.ca/news/story/2003/07/04/Kaopectate_030704.html

Pepto Bismol

While no lead is intentionally added to Pepto-Bismol, this product contains certain ingredients that are mined from the ground and thus contain small amounts of naturally occurring lead. For example, bismuth, contained in the active ingredient of Pepto-Bismol, is mined and therefore contains some naturally occurring lead. The small amounts of naturally occurring lead in Pepto-Bismol are low in comparison to average daily lead exposure; this is for the information of healthcare professionals. Pepto-Bismol is indicated for treatment of acute upset stomach symptoms and diarrhea. It is not intended for chronic use.

<http://www.drugs.com/drug/pepto-bismol-original-liquid-maximum-strength-liquid-original-and-cherry-tablets-and-easy-to-swallow-caplets.html>

According to a Pepto Bismol representative who I spoke with on the telephone in June 2011, Pepto Bismol does "contains naturally-occurring amounts of lead." She doesn't have any information about how much that is.

ADDITIONAL BEAUTY PRODUCTS

Facial Cleanser

- Iman Oil Free Cleanser



Lipstick

Red lipsticks may contain more lead than others. In October 2007, 33 brand-name red lipsticks were tested by a U.S. consumer rights group. Of these, 61% had detectable lead levels of 0.03 to 0.65 parts per million (ppm)

and 39% had no discernible lead. Cover Girl, L'Oreal and Christian Dior had more lead than others. FDA has no specific allowable limit for lead in lipstick, but compared to FDA's 0.1 ppm limit for lead in candy - a standard established to protect children from ingesting lead - one-third of the lipsticks tested exceeded this limit.

Lipsticks with lead levels higher than 0.1 ppm

Brand	Product Name/Shade	Lead	Parent Co.	State	Purchased/Date
Maybelline NY	Moisture Extreme Scarlet Simmer	0.11	L'Oreal	CT	08/27/07
Cover Girl	Incredifull Lipcolor Maximum Red	0.12	P & G	CA	08/23/07
Peacekeeper	Paint Me Compassionate	0.12	Peacekeeper	MA	08/27/07
Maybelline NY	Moisture Extreme Midnight Red	0.18	L'Oreal	MN	08/26/07
Maybelline NY	Moisture Extreme Cocoa Plum	0.19	L'Oreal	CA	08/23/07
Dior	Addict Positive Red	0.21	LVMH	CA	08/23/07
Cover Girl	Continuous Color Cherry Brandy	0.28	P & G	CA	08/23/07
L'Oreal	Colour Riche True Red	0.50	L'Oreal	MN	08/26/07
Cover Girl	Incredifull Lipcolor Maximum Red	0.56	P & G	MN	08/26/07
L'Oreal	Colour Riche Classic Wine	0.58	L'Oreal	CT	08/27/07
L'Oreal	Colour Riche True Red	0.65	L'Oreal	CA	08/23/07

* Purchased from Web consultant based in Boston

<http://www.safecosmetics.org/docUploads/A%20Poison%20Kiss%2Epdf>

FDA contests the validity of comparing safe lead levels in candy to lipstick. From their website:

It is not scientifically valid to equate the risk to consumers presented by lead levels in candy, a product intended for ingestion, with that associated with lead levels in lipstick, a product intended for topical use and ingested in much smaller quantities than candy.

FDA has not set limits for lead in cosmetics, only for color additives used in cosmetics (no more than 20 ppm.) California recommends that lipstick contains less than 5 ppm lead and Health Canada, less than 10ppm.

In August 2009, a Food and Drug Administration study identified lead in all 20 red lipsticks it tested (from 10 different brands), and at concentrations up to four-times higher than those found in independent testing. The levels detected averaged 1.07 Parts per million (ppm). The maximum result was 3.06 ppm.

In 2011, FDA tested 400 lipsticks and detected some quantity of lead in all but three. The expanded survey found that the average lead concentration in the 400 lipsticks tested was 1.11 ppm, very close to the average of 1.07 ppm obtained in their initial survey. The highest result was 7.19 ppm. For a list of all test results:

<http://www.fda.gov/Cosmetics/ProductandIngredientSafety/ProductInformation/ucm137224.htm>

According to the FDA, some ingredients used to make some cosmetics do contain trace amounts of lead. However, the manufacturing process (at least in the United States) is stringently monitored and each batch is tested to make sure it does not contain dangerous levels of lead and other elements. All dyes used in cosmetics (and foodstuffs) have to be vetted by the FDA for safety, and although some of the colorants the FDA gives approval to do contain lead, it is present in such miniscule amounts that they claim it has no adverse effects on consumers. Manufacturers who wish to do business in the USA are restricted to the use of FDA-certifiable colors only; otherwise their products will not be allowed in the country. Each approved dye has its own rigid set of specifications which must be adhered to - every time a manufacturer prepares a batch of dye for use in its products, it has to submit a sample from that batch to the FDA for certification. Only the FDA can certify colors as safe — no one else has that authority. The FDA issues other restrictions dependent on the end use of the product. Lips are considered mucous membranes and products intended for such use can contain only certain FDA-approved dyes which is a smaller subset of approved dyes.

<http://www.snopes.com/toxins/lipstick.asp>, <http://www.breakthechain.org/exclusives/lipstick.html>

Helpful hint: Go to www.ewg.org and click on *Skin Deep: Cosmetic Safety Database* for information about the safety of cosmetics and personal-care products. For FDA's *Questions and Answers* page on this subject, go to:

<http://www.fda.gov/cosmetics/productandingredientsafety/productinformation/ucm137224.htm>

Tattoo Ink

Nine tattoo ink and pigment manufacturers were sued in August 2004 for allegedly exposing people to potentially dangerous levels of lead and other metals. The American Environmental Safety Institute, which filed the suit, is asking for an order to require warnings on the products before they can be sold or applied to a customer's skin. Health risks are widespread, with at least 16 percent of Americans having one or more tattoos. Thirty-six percent of adults ages 25-29 reportedly have at least one tattoo.

Most tattoo inks technically aren't inks. They are composed of pigments that are suspended in a carrier solution. Today's pigments are usually not vegetable dyes, rather they are metal salts. However, some pigments are plastics and there are probably some vegetable dyes too. The pigment provides the color of the tattoo. The carrier keeps the pigment evenly distributed in a fluid matrix, inhibits the growth of pathogens, prevents clumping of pigment, and aids in application to the skin. When alcohol is used in the ink or to disinfect the skin's surface, it makes skin more permeable and allows more chemicals to cross into the bloodstream.

Manufacturers of inks and pigments are not required to reveal the contents - the information is proprietary (trade secrets). A professional who mixes his or her own inks from dry pigments will be most likely to know the composition of the inks. Check out the Material Safety Data Sheet (MSDS) for any pigment or carrier. The MSDS won't be able to identify all chemical reactions or risks associated with chemical interactions within the ink or the skin, but it will give some basic information about each component of the ink. Pigments and tattoo inks are not regulated by the US Food and Drug Administration. Many inks mix one or more pigments. For a table listing the colors of common pigments used in tattoo inks, go to:

<http://chemistry.about.com/library/weekly/aa121602a.htm> (Pb=lead, Cd= cadmium, Hg=mercury)

Hair dye

Lead acetate is used as a color additive in "progressive" hair dye products such as Grecian Formula and Youthair. These products are applied over a period of time to achieve a gradual coloring effect. Tests on people who used Grecian Formula under controlled conditions showed they had "no significant increase in blood levels of lead" and the lead was not shown to be absorbed into the body through such use. The FDA therefore allows this ingredient but requires the following caution statement on product labels:

Caution: Contains lead acetate. For external use only. Keep this product out of children's reach. Do not use on cut or abraded scalp. If skin irritation develops, discontinue use. Do not use to color mustaches, eyelashes, eyebrows, or hair on parts of the body other than the scalp. Do not get in eyes. Follow instructions carefully and wash hands thoroughly after use.

Consumers can determine if lead acetate is used in a particular hair dye product by reviewing the product ingredient declaration appearing on the label of the cosmetic package.

<http://vm.cfsan.fda.gov/~dms/cos-lead.html>, <http://www.cehca.org/consumer.htm#espresso>

That said, in Canada, lead acetate has been banned as an ingredient in cosmetics and hair dyes. They say, "based on data indicating skin absorption and possible links to carcinogenicity and reproductive toxicity," it should be prohibited." Lead acetate is already banned from cosmetics in the European Union because manufacturers there could not prove it was safe for use. California deems it a carcinogen.

<http://www.canada.com/montreal/montrealgazette/news/story.html?id=6caa01c2-3fb0-4431-a559-43aece93860>

A 1997 study done at Xavier University showed that lead from a user's hands was transferred to things that were touched, like hair dryers, faucets, and brush handles. Even washing hands did not completely remove the lead. Running fingers through treated hair left lead on the hands. Here are the hair dyes that toxicologists concluded have enough lead to endanger children and possibly adults. Also listed is the amount of lead, in parts per million (ppm), in each product. For a comparison, as of 2009, paint is allowed to contain up to 90 ppm.

Rd Hair Coloring and Groomer, Creme Formula for Men (LT Laboratories) - 5,954 ppm

Youthair Creme, Hair Dressing and Conditioner for Men and Women (Majestic Drug Co.) - 4,762 ppm

Grecian Plus, Gray Control Foam, (Combe, Inc.) - 3,304 ppm.

Lady Grecian Formula, Gentle Liquid with Conditioner (Combe, Inc.) - 3,304 ppm.

Grecian Formula 16, Liquid with Conditioner (Combe, Inc.) - 2,299 ppm.

<http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/1997/02/04/MN17133.DTL>

Helpful hints: To ensure safe use of these products, it is important that consumers follow the directions carefully. While considered safe for use by adults, keep away from children.

Henna

The henna plant is a small shrub that exists naturally in Western Asia and North Africa. The leaves are picked, dried and ground to create powdered henna. Henna naturally comes in only one color (reddish) but it can be combined with other natural plant dyes to produce other colors called *Henna Rangs*. What to avoid are *Compound Henna Dyes*, which are hair dyes made with henna, plus other plant dyes mixed with metallic salts. Many “henna colors” are created with metallic salts. The most frequently used material is lead acetate, though silver nitrate, copper, nickel, cobalt, bismuth and iron salts have also been used. Dyes with lead acetate gradually deposit a mixture of lead sulfide and lead oxide on the hair shaft. When you hear that henna has “metal”, “lead”, or “coats the hair” and “leaves it brittle”, that refers to a *compound henna dye*. Hair bleach, permanent hair color, and permanent wave solution are not a good combination with compound henna dyes. These can result in green, purple, or totally fried hair. Natural henna does NOT have metals, lead, nor does it “coat the hair”. <http://www.hennaforhair.com/science/whatsinit.html>

The coloring agent in the henna leaves is called lawsone. Aside from the issue of lead, in 2001 the European Union’s “Scientific Committee on Cosmetic products” evaluated several studies on the substance and concluded that “lawsone was not suitable for use as a non-oxidising colouring agent for hair dyeing” and gave lawsone a classification 2A: the available data support the conclusion that the substance constitutes a health hazard (SCCNFP 2002b). They also classified lawsone as a category 3: mutagen (SCCNFP 2002b). “The Scientific Committee evaluating the studies concluded that lawsone had a genotoxicity/mutagenicity potential and that therefore no safe threshold for lawsone could be established (SCCNFP 2004). A study by L’Oreal showed that 0.4% lawsone entered from the skin to the bloodstream. Other scientists think this is a low estimate.

http://www.hennapage.com/journal/issue_I/article_5/page1.html

http://www.mst.dk/homepage/default.asp?Sub=http://www.mst.dk/udgiv/publications/2005/87-7614-794-0/html/kap01_eng.htm

Helpful hints: Buy body art quality henna and mix it yourself!

To find out if the henna hair dye you've been using contains toxic metallic salts:

1. Harvest some of your hair.
2. Mix one ounce (30 ml) of 20-volume peroxide and 20 drops of 28% ammonia.
3. Put your harvested hair in the peroxide-ammonia mix (this is in synthetic hair dye). If there's lead in the henna you've used, your hair will change color immediately. If there's silver nitrate in the henna you've been using, there will be no change in hair color, because silver is coating the hair. However, silver nitrate leaves a greenish cast to your hair, so you can tell by that. If there's copper in the henna you've used, your hair will start to boil, the hair will be hot and smell horrible, and the hair will disintegrate.

<http://www.hennaforhair.com/science/whatsinit.html>

OTHER

Pet Toys

While regulations state that no child’s toy should contain 100 ppm lead or greater (August 2011), there are no regulations for lead level in pets’ toys.

Industrial emissions

Power plants

Additional Lead sources read about but not yet researched/included

Burning of paper logs	Liver, Organ Meats	Earthenware
Cocktail glasses	Mascara	Some sidewalk chalk
Eating utensils	Water fountains	T-shirt transfers
Explosives	Pesticides	Diving weights
Fertilizers	Rain water/Snow	High-temperature lubricants
Hot beverage machines	Bone china	Simulated pearls
Insecticides	Fruits	Old knife sharpeners

Printed materials - Newspapers, magazines, & plastic bread bags often contain lead-based inks which can be harmful to children, if chewed. Avoid using these materials to wrap food.

<http://www.leadpoisoningnews.com/facts.htm>, <http://www.leadpoisoningnews.com/whatis.html>

Where lead is not (according to current knowledge):

Pencils

Believe it or not, there's no lead in pencil lead! The center of the pencil -- known as the writing core -- is made of a nontoxic mineral called graphite. Today's writing cores are a mixture of graphite and clay. By varying the ratio of graphite to clay, pencil makers can adjust the "hardness" of the writing core. Graphite is a form of carbon that is unrelated to lead and is nontoxic to humans.

Do be careful about the paint ON the pencils, however. Read labels to learn if the product conforms to standards ASTM D4236, EN71, or has the US Writing Instruments Manufacturers Association's PMA Seal of certification. These are voluntary standards, meaning the manufacturers are claiming that they meet the requirements; therefore, there is always a risk that despite the certification, the product does not comply. If there is no certification mark, the pencils may be okay or there may be some lead or other toxins. Confusing, no? The best we can do is to look for certification marks and trust.

<http://www.pencils.com/unlead.html>

Toothpaste

Prior to WWII, toothpaste was packaged in small lead/tin alloy tubes that were coated on the inside with wax but they discovered that lead from the tubes leached into the product. It was the shortage of lead and tin during WWII that led to the use of laminated (aluminum, paper, and plastic combination) tubes. At the end of the twentieth century pure plastic tubes were used.

Newspaper Ink

Lead was banned as an ingredient in ink by the EPA in 1985 and is, therefore, no longer a threat.

<http://ohioline.osu.edu/cd-fact/0122.html> Newspaper ink used today (95% of it) is soy-bean based and uses carbon to create the black color. http://wiki.answers.com/Q/Does_newspaper_ink_contain_lead

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