

Lead

An awareness of restricted substances is critical for all involved in the leather supply chain. Many substances are restricted either through legislation or through the brands and eco-labels. Although the leather industry is becoming more aware of the substances that are restricted, it is of interest to consider the background to their listing and some of the reason behind their restriction.

This article provides an overview of the element lead (Pb). Other substances will be addressed in the future and members are invited to suggest those of particular importance for inclusion.



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What is lead?

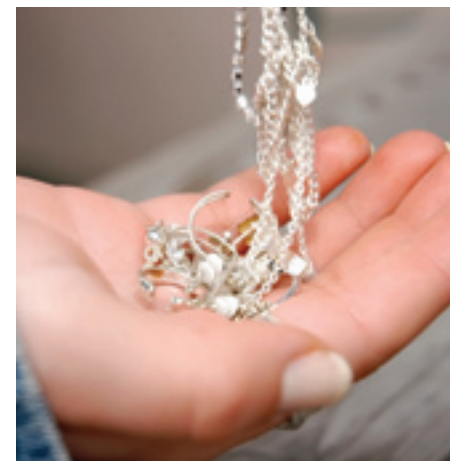
Lead is a post-transition metal which can occur naturally in its native form - this is rare and the most important lead mineral is Galena. More commonly, lead is found in ore with zinc, silver and copper, so it is often extracted with these metals. In appearance, when lead is freshly cut it is a bluish-white colour which tarnishes quickly in air to a dull grey. It is well known that lead is a poisonous metal as it can cause damage to the nervous connections, and also blood and brain disorders.

Most lead ores contain only 10% lead and can contain significant concentrations of silver, resulting in the smelted metal also containing silver as a contaminant. Metallic silver and gold are removed and recovered economically. Production and consumption of lead is increasing annually and is now about 8,000,000 tonnes/year of which half is produced from recycled scrap.

The toxicity issues

Lead poisoning, a medical condition caused by increased blood lead levels, is one of the main issues when considering lead toxicity. Lead may cause irreversible neurological damage as well as renal disease, cardiovascular effects, and reproductive toxicity. Unlike some other metals, lead has no known biological role in the body. The toxicity comes from its ability to mimic other biologically important metals, the most notable of which are calcium, iron and zinc. Lead can displace other metals in enzymes and thus deactivate them.

Long-term exposure to lead or its salts can cause neuropathy, and colic-like abdominal pains. The concern about lead's role in cognitive deficits in children has brought about widespread reduction in its use. The majority of cases of adult elevated blood lead levels are workplace-related. Many older houses may still contain substantial amounts of lead paint, this is why old paint should not be stripped by sanding, as this generates inhalable dust. Lead salts used in pottery glazes have on occasion caused poisoning, when acidic drinks such as fruit juices have managed to leach lead ions out of the glaze.



BLC can offer heavy metal testing with a range of extraction processes.

Industrial uses

Lead is a dense, ductile, soft, very malleable metal and for this reason has many uses in industry of which a few are outlined below:

- Lead is used as a colouring pigment in ceramic glazes, most often bright red and yellow, and historically has, also been found in other industries using pigment based finishing systems such as the leather industry.
- Lead is a major constituent of the lead-acid battery used extensively in car batteries.
- Lead is used as projectiles for firearms and fishing sinkers because of its high density, low cost compared to alternative products and ease of use due to relatively low melting point.
- Lead or "sheet-lead" is used as a sound deadening layer in such areas as wall, floor and ceiling design in sound studios where levels of airborne and mechanically produced sound are targeted for reduction or virtual elimination.
- Lead is used in some candles to treat the wick to ensure a longer, more even burn. Because of the dangers, European and North American manufacturers use more expensive alternatives such as zinc.
- Lead is used as shielding from radiation.

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What can go wrong – Case Studies

Even though lead is heavily legislated against in children's articles, some items can fall through the quality 'net' and there have been a number of high profile cases where major brands have suffered as a result of poor quality control in relation to lead and other heavy metals.

The presence of unacceptably high levels of lead in consumer products is particularly topical with a number of toys manufactured in China being recalled recently and also examples of lead being present in children's jewellery.

How to ensure that products are safe

EN71 is a European standard governing the safety of toys. Part 3 of the EN71 regulations covers the migration of elements (see heavy metal testing article in this edition of the journal).

Whilst this standard is intended to cover toy testing, it is fast becoming the standard to be used for heavy metal safety and assurance for consumer products including leather and leather based products.

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For further information on this and other aspects of lead and heavy metals please contact Vikki Addy on +44 (0) 1604 679940 or email vikki@blcleathertech.com

