

The Swedish Chemicals Agency is supervisory authority under the Government. We work in Sweden, the EU and internationally to develop legislation and other incentives to promote good health and improved environment. We monitor compliance of applicable rules on chemical products, pesticides and substances in articles and carry out inspections. We review and authorise pesticides before they can be used. Our environmental quality objective is A Non-toxic Environment.

March 2015

Dangerous metals in jewellery

Jewellery is often made from several different materials which can contain harmful substances. Since most jewellery is often worn close to the skin and can be put into the mouth, the risk of substances that are dangerous for humans entering the body increases. Certain substances are also hazardous to the environment and risk causing damage after the jewellery has been discarded and has become waste.

Nickel

Nickel is the most common cause of contact allergy. This is because nickel ions can easily be released from certain metals and react with the skin. Examples of objects that can cause nickel allergy are jewellery, watches, zippers, buttons, keys and coins.

The allergy starts with the skin having been exposed to nickel through direct contact over a sustained period. Upon renewed contact with objects which give off nickel the problem can re-occur and the allergy is life-long. It is normal for those who are allergic to nickel to have hand eczema. The risk of hand eczema increases if a person often is in contact with soap, water, solvents and other irritating substances which may cause skin dryness. Nickel allergy can, in certain cases, cause such severe problems that one is forced to change employment in order to reduce exposure to the substances and materials which trigger the allergy.

There are metal alloys which contain nickel but which do not cause allergy problems since the nickel is strongly integrated and is not released. One example is stainless steel. On the other hand there are other alloys which contain nickel but where the substance is easily released; such an example is nickel silver.

Cadmium and lead

Cadmium is a metal which can cause cancer and which is also toxic to the aquatic environment. If cadmium is accumulated in the human body it can cause injury to the kidneys and can lead to osteoporosis.



Photo: Leif Olofsson

Cadmium is used in jewellery to make the metal glitter and to make the jewellery heavier. Cadmium can also be present in jewellery as a contaminant. This can be due to metal from other articles having been re-used or because cadmium occurs naturally in the earth's crust together with other metals, such as zinc.

Lead is a metal which can cause damage to the nervous system and impair intellectual development and performance ability. Foetuses and small children are extra sensitive since their nervous system is not fully developed. Lead is used in jewellery to make the metal heavier and easier to fashion. Lead can also be used in plastic parts of jewellery in order to strengthen the plastic. Low levels of lead can also be found in jewellery as a contaminant.

The greatest risk with cadmium and lead is if children ingest it orally, for example by sucking the jewellery or managing to swallow it. There is also a risk that cadmium and lead can detach itself from the jewellery and end up on the hands and then enter the mouth via food. The skin does not absorb much of these metals so skin contact only does not involve a major risk.

Rules

There are rules within the EU which restrict how much *nickel* may be given off from jewellery. The rules also cover other objects which come into direct and long-term contact with the skin, such as buttons and zippers on clothing. The rules do not cover hand tools, coins and handles, despite the fact that these can cause nickel allergy.

In the rules there is a limit to how much nickel is allowed to be released from objects. For piercing jewellery the limit is 0.2 µg/cm²/a week and for other objects it is 0.5 µg/cm²/a week. The rules also state that surface treatment to prevent nickel emission shall withstand two years wear and tear. The rules have existed in the EU since 2000.

There are rules within the EU which limit the content of *cadmium* in the metal parts of jewellery. Parts for jewellery manufacture and hair accessories are also covered by the rules. The content of cadmium in metal may not be greater than 0.01 percentage by weight. The rules do not apply to jewellery placed on the market before 10 December 2011 or that were older than 50 years on that date. Such jewellery may thus continue to be sold.

Cadmium is also banned in different types of plastic (the limit is 0.01 percentage by weight) and it also applies to parts of jewellery which are made of plastic.

Where *lead* is concerned there are EU rules which restrict the content of lead in different parts of jewellery. The lead content must be less than 0.05 percentage by weight. The limit applies not only to metal but also to other materials that may be present in jewellery, such as plastic. Certain materials are, however, excluded, such as crystal glass, enamel and precious stones.

The rules do not apply to jewellery articles placed on to the market before 9 October 2013 or to jewellery produced before 10 December 1961. The rules for nickel, cadmium and lead in jewellery are to be found in the REACH Regulation, Annex XVII (cadmium entry 23, nickel entry 27 and lead entry 63). The limits apply when the objects are placed on the market, i.e. when they are supplied or made available (for example, sold or given). There is no requirement in the rules for jewellery to be labelled.

Responsibility

Companies which sell or otherwise provide jewellery must ensure that their jewellery does not contain too much cadmium or lead and also that it does not release too much nickel. It is important that companies impose requirements on their suppliers, especially when the jewellery is bought outside the EU since the suppliers there are not covered by the rules. This can be written into the purchase agreement. It can also be appropriate for companies to test jewellery articles, by means of random sampling for example.

The Swedish Chemicals Agency and the municipalities share enforcement of the rules governing metals in jewellery. They can conduct random checks and inspect companies in order to monitor their preventive work.

If a company sells jewellery which does not comply with the rules, the enforcement authority requires the sale to cease. The authority may also report a notification of suspected breach to the prosecution authorities.

Consumers can test for themselves to see if nickel is released from an object by means of a nickel test which can be bought at pharmacies. For cadmium and lead there are currently no simple tests that consumers can employ in order to test jewellery for themselves.

Please contact the Swedish Chemicals Agency if you suspect that a company selling jewellery does not comply with the rules.

Examples of jewellery and accessories to which the rules apply

- Earrings, rings, necklaces, bracelets
- Watches, bracelets and wristwatch straps
- Hair slides and other hair accessories
- Piercing jewellery
- Brooches, cuff-links
- Parts used in jewellery manufacture
- Buttons, zippers and other metal parts on clothing (only nickel)

More information about the rules can be found on the Swedish Chemicals Agency's website at www.kemikalieinspektionen.se.