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EU Regs are Tough on Nickel

Dear Mr. Altmayer,

I read with great interest your recent article on nickel in jewelry in the December 2003 edition of *Plating & Surface Finishing*. I think the situation in Europe is now a bit more wide-sweeping than you indicated. The banning of nickel-containing jewelry is now a done deal. The final stage of the process was to develop a suitable test method that would be applicable to these applications and this has now been done.

You are correct about the way the regulations were introduced on a piecemeal basis, but they have now become unified. The main protagonists have been Sweden, Denmark and, to a certain extent, Germany, but all countries now abide by the rules. That does not stop them from criticizing Sweden for being too over the top. (It is also worthy of mention that Sweden still widely uses Ni-Cd batteries and cadmium plating for military and naval use!)

As of January 2000, it is illegal to sell jewelry that contains 0.05% nickel or anything that releases more than 0.05μg/cm^2/week. That is, any article that releases more than 0.05 micrograms per square centimeter surface area that is in contact with the skin, per week. This regulation applies to all member states of the EU (European Union) and will apply to all new members as, and when, they become full members. The regulations are aimed at jewelry and other articles that come into "direct and prolonged" contact with the skin. It is this phrase that captures everything from jewelry to buttons, combs, rivets on clothes watch straps, etc. However, I am not sure that the phrase has been accurately defined, but is used as a catchall for anything the enforcing agencies want to take action against. Furthermore, the article must not release more than these levels for a minimum of two years usage. The only exception to the rule is anything that is sold second hand, as long as it was first sold prior to 2000.

The Nickel Directive

The relevant regulation is EU Directive 76/769/EEC, but its implementation was delayed for many years whilst the EU developed a suitable and agreeable test procedure for such low release rates. These were finally agreed in 1999 and were published as EN 810, 1811 and 12472. EN 810 applies to body piercing posts, whilst EN 1811 applies to articles in "direct and prolonged contact"; EN12472 applies to articles designed for use longer than two years. The real stumbling block was the test solution and this is described in EN1811, which specifies an aerated deionized water solution of 0.5% sodium chloride, 0.1% urea and 0.1% lactic acid at pH = 6.5 +/- 0.1 (this is adjusted with 1% ammonia solution). Articles are soaked in this solution for a greed period (usually one week) at a constant temperature of 30+ /-2C. Analysis for Ni should be done by AA or another suitable method, such as ICP.

One problem has always been trying to determine the surface area of an article that is in contact with the skin.

The level of the problems associated with nickel are difficult to accurately quantify, but in Europe it is widely assumed that about 15% of females and 5% of males are susceptible to nickel allergies. It was originally thought to be a "female only" problem as it was originally found in bra straps and womens' stocking suspender belts, but with the proliferation of men wearing jewelry, it has become even more common. There is some disputed evidence to suggest the levels of the problem are nationality related, but this is probably down to the use of jewelry and its type; it could also be coupled to the ease of access to dermatologists!

Recently there were claims the EU coinage contained nickel that exceeded both the maximum quantity and the allowed release rate, but there is some dispute as the whether the coins are in " direct and prolonged contact." Consequently, although the regulations are a potential minefield for the electroplating and consumer metals industries, the simplest solution is to avoid using nickel in any article that may fall into the catchall phrase "Direct and prolonged contact."

As far as nickel and cancer is concerned, there is some pretty damming evidence against some of the nickel bearing ores and this has (unfortunately) been extrapolated to all nickel salts. I think we all agree that if you feed enough rats enough random chemical for long enough, at least some of them will develop cancer! Most of the nickel/cancer warnings indicate that it may cause cancer, not will, although there are moves to make them say nickel will cause cancer.

I apologize for this being so long, but I hope you find it of interest. I am sure that further information is available form the NiDI (Nickel Development Institute) Web site.

Best wishes,

Trevor Crichton

Thank you Mr. Crichton for a most enlightening vision of what is going on in Europe.

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