



# Phasing out Mercury Use in Button Cell Batteries



**Button cell battery in wristwatch**

Because button cells account for the bulk of mercury use in the battery sector, significant mercury reductions in this sector can only be achieved by phasing out mercury use in button cell battery production. Fortunately, the technology for producing mercury free button cells is already well established, and many major producers are already transitioning toward a mercury free future in response to market forces and policy directives. The mercury treaty should complete this transition by requiring all manufacturers to participate through a phase-out deadline for this product category.



**Hearing aid and zinc air battery**

## Types and uses of button cells batteries

There are three common technologies or chemistries for mercury-added miniature batteries: zinc air, silver oxide, and alkaline. These three battery types can contain 0.1% to 2.0% mercury. Historically, mercury oxide, which had a mercury content of 30-50%, was also used, but this battery type is no longer manufactured in large quantities.

Mercury is used to inhibit corrosion. Corrosion in batteries can lead to gas build-up, and gas build-up can lead to bulging and leakage, or can adversely affect battery performance.

Miniature battery chemistries are not interchangeable by design, since they offer different voltages, capacity, shelf life and other characteristics. Zinc air batteries are mostly used in hearing aids and ear implants, but can also be found in pagers. Silver oxide batteries are most frequently used in watches, clocks, calculators, games, and cameras. Alkaline batteries are often used in applications such as toys, key chains, and remote controls.

## Mercury-free alternatives are available

Major producers of all three battery types now make large quantities of mercury-free products which the industry believes work as well as the mercury-added versions.

The availability of these mercury-free products will increase substantially in the next five years in response to government policies and market forces.

### Zinc air

Rayovac is the largest producer of zinc air batteries in the world, with production facilities in both the USA and EU. Rayovac launched its first generation of mercury-free zinc air batteries in March 2009, and a second generation in December 2010. Rayovac believes its mercury-free batteries perform equally or better than their mercury-added counterparts. More broadly, Rayovac believes the technology for the elimination of mercury in all button cells is “available and robust”, and that “elimination of mercury from button cells “is the right thing to do.”<sup>1</sup> Other major manufacturers offering mercury free zinc air batteries include *Energizer*, *Varta*, *Duracell* and *Renata*.

### Silver oxide

Mercury free silver oxide batteries were introduced by SONY in 2005, and now SONY makes 34 different mercury free silver oxide models. Other manufacturers offering mercury free silver oxide batteries include *Seiko*,



Maxell, Renata, Energizer, Duracell, and Rayovac.

### Alkaline

China is the main source of alkaline button cells globally. In 2010, China's 20 producers manufactured over nine billion alkaline button cells. Ten percent of China's production is already mercury free from manufacturers such as *New Leader*, *Chung Pak*, and *Pak Ko*.

### Phasing Out Mercury in Button Cell Batteries around the Globe

On December 31, 2011, the Chinese government released its Clean Production policy for the battery sector, which calls for a 65% reduction of mercury use by 2015 sector-wide, largely achieved through the promotion of mercury free technology for alkaline button cells. As stated in the policy, “By promoting this technology, producing mercury-free button cell alkaline zinc manganese battery can be realized, and reduce mercury consumption by 90 tons annually, a 63% reduction in mercury consumption.”<sup>2</sup>

Virtually all of the button cell production in the USA now is mercury free. In the EU, a study was carried out for the European Commission on the potential for reducing mercury pollution from batteries.<sup>3</sup> Based on this study, a ban on placing on the market mercury-added button cells is recommended. The EU battery manufacturers generally support the phase-out of mercury use in button cells. Almost all have confirmed that the mercury free alternatives are available for all applications, and like the USA manufacturers, they believe mercury free button cells will achieve equivalent performance to the models containing mercury. To that end it is expected that the EU will take relevant measures to put in place such a policy as soon as possible, and at the latest, during the foreseen overall review of the EU Batteries directive in 2016.

<sup>1</sup> See [www.rayovac.eu/imagemanager/file/Q&A%20English.pdf](http://www.rayovac.eu/imagemanager/file/Q&A%20English.pdf)

<sup>2</sup> Notice of Issuing Clean Production Solution for Battery Industry, China MIIT, No. 614, Issued December 31, 2011.

<sup>3</sup> [http://ec.europa.eu/environment/chemicals/mercury/pdf/BIO\\_Draft%20final%20report.pdf](http://ec.europa.eu/environment/chemicals/mercury/pdf/BIO_Draft%20final%20report.pdf)