



**Public guidance on the hazardous waste status of zinc-carbon,
zinc chloride, alkaline, and nickel-metal hydride batteries under
Australian Government Hazardous Waste Legislation**

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This document sets out the Department of the Environment and Energy's position on the hazardous waste status of zinc-carbon, zinc chloride, alkaline, and nickel-metal hydride batteries under the *Hazardous Waste (Regulation of Exports and Imports Act) 1989* (the Act) and Hazardous Waste (Regulation of Exports and Imports) (OECD Decision) Regulations 1996 (the OECD Regulations). It provides guidance on whether a hazardous waste permit is required to export waste zinc-carbon, zinc chloride, alkaline, and nickel-metal hydride batteries to another country.

What is a zinc-carbon/zinc chloride battery?

Zinc-carbon and zinc chloride batteries are single cell primary (non-rechargeable) batteries. The positive pole (anode) consists of a carbon rod encased in manganese dioxide. The battery's case, which is also the negative pole (cathode) is made of zinc. The case contains a paste of ammonium chloride or zinc chloride. The carbon is not consumed during the discharge of the battery.

What is an alkaline battery?

Alkaline batteries are non-rechargeable and are also called manganese or primary batteries. The positive pole (anode) of the battery contains zinc, while the negative pole (cathode) contains manganese dioxide. Potassium hydroxide electrolyte, a strong alkali, is contained within the cells of alkaline batteries. The potassium hydroxide electrolyte is not consumed during discharge of the battery.

What is a nickel-metal hydride battery?

Nickel-metal hydride batteries are rechargeable and are also called NiMH, Ni-MH and LSD NiMH (for low self-discharge cells). The positive pole (anode) is made of a range of materials, including rare earths such as lanthanum, cerium, didymium, or praseodymium, or titanium, vanadium, and zirconium. The negative pole (cathode) is nickel oxide hydroxide (nickel oxyhydroxide). Nickel-metal hydride cells contain an alkaline electrolyte, usually potassium hydroxide. The potassium hydroxide is not consumed during discharge of the battery.

Does Australia consider waste zinc-carbon, zinc chloride, alkaline, or nickel-metal hydride batteries to be hazardous wastes?

Australia assigns the Basel Convention code B1090 in Annex IX¹ to waste zinc-carbon, zinc chloride, alkaline, and nickel-metal hydride batteries, so long as the waste batteries have no hazardous characteristics, such as being flammable, explosive, or toxic. These batteries do

¹ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, *Hazardous Waste (Regulation of Exports and Imports) Act 1989*, Part 6 (Schedule), <http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf>



not require an import permit to enter Australia. Batteries meeting these criteria are also known as List B batteries for the purposes of the Basel Convention.

What are the appropriate standards for packing waste batteries of any kind for transport by air or sea?

The UN Recommendations on the Transport of Dangerous Goods (Model Regulations) cover the transport of dangerous goods by most modes of transport. These inform the appropriate standards for packing waste batteries. Standards appropriate to air and sea transport, respectively, are outlined in the:

- International Air Transport Association Dangerous Goods Regulations; and the
- International Maritime Dangerous Goods Code.

We recommend exporters approach their freight forwarder, the Civil Aviation Safety Authority (www.casa.gov.au), or the Australian Maritime Safety Authority (www.amsa.gov.au), as appropriate, for information on battery packaging, to ensure any proposed waste shipments are packed according to the internationally accepted standard for dangerous goods.

Exporting List B Batteries: Additional Requirements

It is the responsibility of the waste exporter to check whether the destination and transit countries require a hazardous waste permit to import or transit the waste batteries and obtain the relevant consents, if required, and to ensure that the facility at which the batteries will undergo recovery operations is appropriately authorised to undertake such operations.

At the time of writing, some countries advised the Department that they consider zinc-carbon, zinc chloride, alkaline, or nickel-metal hydride batteries to be List B wastes, as long as the wastes are appropriately packed and transported.

I want to export a mixture of zinc-carbon, zinc chloride, alkaline, or nickel-metal hydride batteries. Do I need an Australian export permit?

The Department of the Environment and Energy would consider a mixture of List B waste batteries as being suitable for shipment under Basel waste code B1090. You must obtain a permit if you propose to ship List A batteries (Basel Code A1170) mixed with list B batteries.



Other Reading

<https://www.legislation.gov.au/Details/C2017C00194>

<https://www.legislation.gov.au/Details/F2017C00560>

https://en.wikipedia.org/wiki/Nickel%E2%80%93metal_hydride_battery

https://en.wikipedia.org/wiki/Alkaline_battery

https://en.wikipedia.org/wiki/Comparison_of_battery_types

<http://www.batteryrecycling.org.au/>

<http://recyclingnearyou.com.au/>

<http://ec.europa.eu/environment/waste/batteries/pdf/faq.pdf>

<https://www.amsa.gov.au/vessels-operators/cargoes-and-dangerous-goods/cargo-regulations>