

Managing batteries at resource recovery centres

Batteries are classified as a combustible material that could create a fire hazard if not stored and managed correctly. Operators should comply with the Environment Protection Authority Victoria's (EPA's) *Waste Management Policy (Combustible Recyclable and Waste Materials)*.

Key points

- › Batteries are energy storage devices used to power electrical equipment such as power tools, toys, torches, vehicles and cordless phones.
- › Batteries are flammable, electrical and toxic and are classified as a specified e-waste. They contain both hazardous and precious materials such as cadmium, lithium, nickel, silver oxide and zinc that can be safely disposed of or recovered through treatment or recycling.
- › Batteries must be separated from the processing and disposal of general waste. They should not be sent to landfill.
- › Various acts, regulations, standards and guidelines apply to batteries at resource recovery centres and transfer stations.

Types of batteries

Common types of batteries include:

- › **Lead acid batteries**
from cars (and farm equipment in regional areas only)
- › **Alkaline batteries** (AA, AAA, 9 volt and 6 volt lantern (or spring))
- › **Nickel-metal hydride (NiMH) batteries**
(used in toys, torches, radios, etc.)
- › **Rechargeable alkaline, nickel cadmium (NiCad) and lithium metal batteries** (used in hearing aids)
- › **Lithium-ion batteries**
(used in power tools, mobile phones and laptop computers)
- › **Mercury batteries**
(usually in round button cells) used in older small devices.

Battery storage systems

Energy can be stored in a battery and later released to produce electricity. These battery storage systems are becoming more popular in Australia and should only be removed by approved and licensed personnel.

The Clean Energy Council and the Australian Battery Recycling Initiative (ABRI) published a *Consumer Guide to Responsible Recycling of Battery Storage Systems*, with step-by-step guidance for safe disposal and environmentally responsible management of used battery storage systems. Visit www.batteryrecycling.org.au for more information.

Lithium-ion batteries

Lithium-ion batteries are the most common battery type used in portable electronic devices. The number reaching end of life is expected to increase exponentially over the next 20 years.

Lithium-ion batteries are classified as dangerous goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

Under the ADG Code, all dangerous goods, including lithium-ion batteries must be carried in a secure, safe and environmentally controlled manner. The carrier has the right to refuse carriage if dangerous goods are not packed in accordance with the regulations. The Code has a special provision (No. 377 under Section 3.3.2) and packaging instruction (P909, Table 4.1.4.1 in Part 4) for transporting these batteries for disposal or recycling.

What about rechargeable batteries?

Approximately 70 per cent of batteries sold each year in Australia are single-use batteries. Most end up in landfill. Rechargeable batteries can be recharged hundreds of times, making them a better choice as they:

- › save money
- › reduce the use of finite natural resources in the production of batteries
- › reduce the release of greenhouse gasses associated with extracting these resources
- › divert batteries from landfill which contaminate soil and groundwater.

Potential hazards

Batteries contain many materials that can pose hazards to public health and the environment. For example, each car battery contains around two to three litres of sulfuric acid, as well as lead and lead compounds, all of which are toxic.

Potential hazards include:

- › chemicals from leaking batteries can be toxic and cause burns or skin irritation
- › chemicals in batteries can be flammable and potentially explosive
- › batteries can produce sparks and be a potential ignition source
- › larger batteries still containing significant energy can cause electrocution
- › some batteries can be heavy and awkward to lift — a lead acid car battery weighs approximately 14.5 kg.

Regulations

Some of the acts, regulations, standards and guidelines that apply to the safe handling, storing, transferring, transporting and recycling of batteries are listed below.

Australian Battery Recycling Initiative has a series of safety guidelines on the safe collection, storage, transport and handling of used handheld batteries. They give concise information for different stakeholders on the types of batteries that can be recycled, regulations to be followed, and the 'dos' and 'don'ts' of recycling.

Occupational health and safety (OHS)	<ul style="list-style-type: none">› Occupational Health and Safety Act 2004› Occupational Health and Safety Regulations 2007› Compliance Code: Hazardous manual handling (WorkSafe Victoria, 2018)› Liquid storage and handling guidelines (EPA publication 1698)
Environmental	<ul style="list-style-type: none">› Environment Protection Act 1970› Environment Protection (Industrial Waste Resource) Regulations 2009
EPA waste management policies	<ul style="list-style-type: none">› Waste Management Policy (Combustible Recyclable and Waste Materials)
Dangerous goods storage	<ul style="list-style-type: none">› Dangerous Goods Act 1985› Australian Code for the Transport of Dangerous Goods by Road and Rail› Management and storage of combustible recyclable and waste materials – guideline (Publication 1667.2)
Australian standards	<ul style="list-style-type: none">› Packaging Standard for Used Lead Acid Batteries (ABRI)› AS 3780:2008 – The storage and handling of corrosive substances› AS/NZS 3833:2007 – The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers

Accepting batteries

When accepting batteries, you should:

- › separate batteries from general waste and other material streams (e.g. e-waste) within loads
- › separate battery accessories like chargers from batteries and store with an appropriate e-waste recycling stream
- › avoid accepting leaking or corroded batteries
- › only accept domestic quantities of car batteries (i.e. up to five at once) – commercial sources and quantities of batteries should be handled by private waste contractors
- › avoid accepting larger batteries like truck batteries, which are typically managed by private waste contractors specialising in transporting, treating and recycling larger batteries (farm equipment batteries are generally only accepted at regional facilities).



Handling batteries

When handling batteries, you should:

- › always treat batteries as though fully charged
- › use equipment to aid handling, such as forklifts or trolleys
- › wear appropriate personal protective equipment, particularly eye protection, when handling batteries
- › keep batteries away from flammable and combustible materials and ignition sources
- › have a minimum of one person per work area trained in spill response
- › have rescue equipment available on-site and conduct regular emergency response drills
- › follow the correct safe manual handling and management procedures (refer to WorkSafe Victoria's Compliance Code: Hazardous manual handling).

Recycling household batteries

Resource Recovery Centres might want to let customers know that household batteries can easily be recycled at no cost by dropping them off at participating Aldi, Officeworks and Battery World stores, and permanent drop-off sites, typically located at council depots and transfer stations across Victoria. Contact your local council for more information on recycling options.

Storing batteries

Battery storage is important, as batteries can leak toxic chemicals and potentially explode or be an ignition source.

Battery storage should meet the EPA's *Liquid storage and handling guidelines* (publication 1698), which replaces the Bunding guidelines (publication 347). The guidelines help businesses with practical controls to ensure liquid substances are appropriately stored and handled to prevent spills. Carry out a risk assessment and develop a risk management strategy for each site.

For best practice, store batteries in a roofed and bunded area to prevent stormwater infiltration and contain potential spills.

As a minimum, you should store batteries:

- › in a secure, ventilated and roofed area on a sealed surface
- › away from combustible or flammable items such as gas bottles, waste oil, cooking oil, tyres, green waste and timber
- › in a suitably signed area (refer to Sustainability Victoria's signage library) with applicable safety signs.
- › Batteries should be collected and transported to recyclers regularly and not stored for more than six months.



Lead acid car batteries

Store lead acid car batteries on pallets, up to two batteries high, and then shrink wrap in clear plastic wrap ready for transport. Store no more than two pallets of lead acid batteries (approximately 56 batteries) before collecting for recycling.

Alkaline and recyclable batteries (AA, AAA, 9 volt and 6 volt lantern (or spring) batteries)

Store alkaline and recyclable batteries in lined 205 litre (44 gallon) drums placed on pallets. Store no more than two drums before collecting for recycling.

Using pallets for lead acid batteries and drums on pallets for alkaline and rechargeable batteries will enable you to collect, transport and load batteries using forklifts.

Transporting and recycling batteries

Batteries should only be transported and recycled by suitably qualified contractors or suppliers.

You should meet the following minimum standards when transporting and recycling batteries:

- ▶ Intrastate transport of used lead acid batteries may need a waste transport licence and a waste transport certificate (contact EPA Victoria for more information).
- ▶ Do not place batteries in landfill as they may explode or leak toxic and flammable material.
- ▶ Keep records of batteries received and sent for recycling at the resource recovery centre/transfer station to enable tracking of resource recovery from the site, as well as management of onsite storage
- ▶ For best practice, get a certificate of reuse/processing/recycling from the receiving facility.

Used lead acid batteries (ULABs) are classified as a Dangerous Good under the ADG Code. Any organisation involved in transporting ULABs must comply with the Code. The ABRI *Guidelines for Packing & Transporting Used Lead Acid Batteries* explain how to comply with the Code.

Record keeping

Keep records of all batteries received and sent for recycling. For best practice, get a certificate of reuse/recycling from the processing/recycling of the batteries.

Record keeping should include:

- ▶ recording lead acid batteries received at the gatehouse
- ▶ monthly stocktakes of batteries stored at the facility to not exceed the recommended maximum amount stored onsite
- ▶ recording the number or kilograms of batteries collected from the site by the approved contractor.

Batteries and the circular economy

Sustainability Victoria is actively promoting transitioning to a circular economy and reducing reliance on raw materials in production processes by continuously cycling materials of all types back through supply chains.

When deciding how to accept and manage batteries at your facility, the priority is to divert them from landfill, while protecting public health (especially operators and customers) and the environment.

Car batteries can be reconditioned or recycled into new products made from lead, sulfuric acid and polypropylene. Household batteries also contain valuable metals such as cadmium, zinc, manganese, cobalt and rare earth metals that may be recovered through recycling.

To improve the way you manage batteries, consider:

- ▶ working with other local municipalities, waste and resource recovery groups and Sustainability Victoria on consolidating collection and joint procurement activities
- ▶ building relationships with local collection and recycling contractors who meet the relevant standards and regulations.

You might also consider becoming an ABRI member.

ABRI is a not-for-profit association that promotes responsible environmental management of batteries at end of life. Membership demonstrates your facility's support for product stewardship and responsible recycling.

For more information

Australian Battery Recycling Initiative (ABRI)

Email secretariat@batteryrecycling.org.au
batteryrecycling.org.au

EPA Victoria

Phone 1300 372 842
or 1300 EPA VIC
epa.vic.gov.au

WorkSafe Victoria

Phone (03) 9641 1444
or 1800 136 089 (toll free)
worksafe.vic.gov.au

Sustainability Victoria

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