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Button/coin batteries and consumer goods that use button/coin batteries — Safety for consumers



AS 5347:2023

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- Australian Battery Recycling Initiative
- Australian Competition and Consumer Commission
- Australian Industry Group
- Australian Information Industry Association
- Australian Toy Association
- Better Regulation Division (Fair Trading, SafeWork NSW, TestSafe)
- CHOICE
- Consumer Electronics Suppliers Association
- Consumers Federation of Australia
- Federal Chamber of Automotive Industries
- Kidsafe Australia
- Lighting Council Australia
- National Association of Testing Authorities Australia
- National Retail Association Australia
- Office of Fair Trading (QLD)
- Queensland Injury Surveillance Unit
- Queensland University of Technology

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Preface

This Standard was prepared by the Standards Australia Committee CS-118, Button Batteries.

The objective of this document is to promote consumer safety by providing minimum requirements for —

- (a) the securement of batteries and durability of battery compartments of consumer goods that use button/coin batteries;
- (b) warning labels and safety information labels for consumer goods that use button/coin batteries on the product, on the product's packaging; and at point of sale;
- (c) child-resistant packaging for button/coin batteries whether sold separately or supplied with consumer goods; and
- (d) disposal of button/coin batteries.

A number of vertical product standards documents address the hazards associated with button/coin batteries for vulnerable consumers and provide hazard reduction for the equipment within their scope. Several standards are currently recognized as demonstrating conformance to the ACCC mandatory standards series. This document is intended to be consistent with the requirements of the mandatory standards and provides additional requirements and recommendations to address the hazards associated with button/coin batteries for vulnerable consumers, and can be used horizontally across all products.

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The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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Introduction

Following the initial development of button/coin batteries, subsequent efficiencies in cost and battery voltage retention have driven a remarkable evolution in the design and availability of everyday electronic equipment. Coupled with other advances, such as low-cost LED lighting and remote activation, this has resulted in an exponential rise in the number of button/coin battery powered domestic consumer products.

Early button/coin batteries used alkaline chemistry and were typically smaller (<15 mm diameter) and lower voltage (1.5 V). In recent years, lithium chemistry has dominated the button/coin market with a rise in the number of larger (20 mm) and higher voltage (3 V) batteries.

The first reports in the medical literature relating to button/coin battery injury appear in the late 1970s; in 1977 a toddler was fatally injured after ingesting a 23 mm alkaline battery from a movie camera. At the time, the pathophysiology of the caustic injury was neither well understood nor anticipated and although the child survived battery removal, he died several days later due to caustic erosion into his major vessels.

Since those early reports, the mechanism of injury has been well described. If ingested or inserted into the body, hydrolysis occurs if the battery voltage is 1.23 V or greater, producing hydroxide ions at the negative pole and causing a caustic burn. Severe injury occurs when the battery becomes lodged in one position, with most fatalities associated with ingestion and oesophageal impaction. Initial damage occurs within minutes and oesophageal perforation in as little as 2 hours. However, as with the case above, delayed caustic erosion into major blood vessels in the chest can occur despite battery removal. The rise in production of button/coin powered products and the advent of larger and higher voltage lithium batteries has seen injury case numbers rise and a higher fatality rate rise associated with oesophageal impaction.

The hazard posed by button/coin batteries is already addressed in some vertical product standards (e.g. AS/NZS 62115, AS/NZS 62368.1). Hazard reduction in existing standards is achieved through a combination of warnings, restriction to unintended access by small children and product durability. However, it has become clear that the range of domestic products available to the consumer and causing injury in young children extends well beyond products covered by these standards. Therefore, this document addresses the hazard of button/coin batteries horizontally across all products excluding hearing aids and professional equipment.

Hearing aid batteries (predominantly smaller batteries of zinc air chemistry) are less likely to cause severe injury and restrictions to battery compartment access might compromise use for older consumers. Professional equipment is also considered lower risk, where that equipment is stored solely in a work environment.

It is not the intention of this document to exclude new types of batteries if their size and voltage are similar to those described. Ultimately, the measures in this document will not completely eliminate the risk of button/coin battery injury. There are current design strategies proposed that may reduce voltage-generated hydrolysis when a battery is inside the body; however a button/coin battery with a voltage of < 1.23 V can still be fatal due to pressure necrosis in the oesophagus. In addition, children can still obtain batteries when they are accessible during the battery changeover and disposal process. Redesign of products such that button/coin batteries are not used would eliminate this hazard.

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Button/coin batteries and consumer goods that use button/coin batteries — Safety for consumers

Section 1 Scope and general

1.1 Scope

This document applies to button/coin batteries and consumer goods that use these batteries including —

- (a) all variations of battery replaceability, whether consumer replaceable, service technician replaceable, or completely non-replaceable;
- (b) all variations of battery chemistry, whether lithium or non-lithium;
- (c) all battery diameters up to and including 32 mm where the diameter is greater than the battery's height.

This document does not apply to —

- (i) professional equipment intended to be used in trades, professions or industries sold through non-consumer sales channels and not intended to be used or accessed by non-professionals;
- (ii) button/coin batteries sold through non-consumer sales channels to be used by trades, e.g. by service technicians, and not intended to be installed in consumer goods;
- (iii) hearing aids that meet the requirements of IEC 60601-2-66; and
- (iv) button/coin batteries with integral soldering posts.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents for informative purposes are listed in the Bibliography.

AS 5808, *Child-resistant packaging — Requirements and testing procedures for non-reclosable packages for nonpharmaceutical products*

AS/NZS 3100, *Approval and test specification — General requirements for electrical equipment*

IEC 60086-4, *Primary batteries — Part 4: Safety of lithium batteries*

IEC 61032, *Protection of persons and equipment by enclosures — Probes for verification*

IEC 62368-1:2018, *Audio/video, information and communication technology equipment — Part 1: Safety requirements*

EN 862, *Packaging. Child-resistant packaging. Requirements and testing procedures for non-reclosable packages for non-pharmaceutical products*

1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

1.3.1**button/coin battery**

small, disc shaped single cell battery with a diameter greater than the battery's height

Note 1 to entry: The terms "button" and "coin" are generally used interchangeably but are different products (see [Clause A.3](#) for further information regarding the differences).

1.3.2**consumer goods****product****equipment**

goods, including equipment, that are intended to be used, or of a kind likely to be used, for personal, domestic or household use or consumption

[SOURCE: [Competition and Consumer Act 2010 \(legislation.gov.au\)](#)]

1.3.3**consumer replaceable batteries**

batteries in consumer goods that can be removed and replaced by the consumer either using a non-specialised tool or by hand

1.3.4**handheld**

movable equipment, or a part of any kind of equipment, that is intended to be held in the hand or worn during normal use

Note 1 to entry: Examples include calculators, remote controls, key fobs, and personal alarms/trackers.

[SOURCE: IEC 62368-1, 3.3.3.3 modified — "and worn" and note added, "equipment removed"]

1.3.5**portable****transportable**

equipment that is intended to be routinely carried

Note 1 to entry: Examples include notebook computers, kitchen scales, portable luminaires, and portable accessories.

[SOURCE: IEC 62368-1, 3.3.3.11 modified — "kitchen scales, portable luminaires" added, "CD players" and "including their external power supplies" removed]

1.3.6**may**

indicates the existence of an option

1.3.7**non-consumer sales channel**

channel supplying goods not of a kind ordinarily acquired for personal, domestic or household use or consumption primarily to trade or industry for use in their profession

1.3.8**non-replaceable batteries**

batteries that are permanently fitted, and not designed to be replaced

Note 1 to entry: Examples include batteries that are soldered in place.

[SOURCE: ISO 6742-1:2015, 3.10 modified — "lamp whose light source(s) is" and "by the user" removed]

1.3.9**shall**

indicates that a statement is mandatory

1.3.10**should**

indicates a recommendation

1.3.11**tool**

object that can be used to operate a screw, latch or similar fixing means

Note 1 to entry: Examples of tools include coins, tableware, screwdrivers, pliers, etc.

[SOURCE: IEC 62368-1 ed. 3.0, 3.3.6.13. Copyright © 2018 IEC Geneva, Switzerland. www.iec.ch]

1.3.12**vulnerable consumer**

consumer who could be at greater risk of harm from products due to their age, level of literacy, physical condition or limitations, or inability to access product safety information

[SOURCE: ISO 10377:2013, 2.30]

Section 2 Button/coin batteries

2.1 General

This section provides requirements for the marking and packaging of button/coin batteries. See [Appendix A](#) for further information regarding battery types.

2.2 Battery marking

Lithium technology button/coin batteries with a diameter of 20 mm or greater shall be marked with an internationally recognized “keep out of reach of children” symbol (see [Figure 2.2](#) for an example).

The symbol shall —

- (a) be engraved, etched, embossed or stamped on the battery surface;
- (b) have a diameter or other minimum dimension of at least 6 mm; and
- (c) be clearly visible, prominent and indelible.

NOTE 1 Indelible is considered to be a permanent marking that is durable.

NOTE 2 This requirement applies to batteries supplied with goods, whether preinstalled or otherwise packaged with the goods, and to batteries supplied separately to goods.

[SOURCE: ACCC, Consumer Goods (Button/Coin Batteries) Information Standard 2020 (legislation.gov.au), Clause 11, modified, under CC BY 4.0]



Figure 2.2 — Example of keep out of reach of children symbol

[SOURCE: ISO 7010:2019/Amd.2:2020(E) — M055]

2.3 Packaging-accessibility

2.3.1 General

The requirements in this clause do not apply to batteries:

- (a) sold in bulk through non-consumer sales channels for use by trades, professions or industries; and
- (b) supplied already installed in consumer products.

NOTE 1 Accessibility for batteries supplied installed in products is managed by the product's conformity with [Section 3](#).

NOTE 2 The exclusion does not cover batteries supplied with products but not installed in them.

2.3.2 Single battery packaging

The following types of batteries:

- (a) All lithium batteries; and
- (b) Non-lithium batteries with a diameter of 16mm or greater

supplied separately to products that use them or with products but not installed in them shall conform to at least one of the following conditions:

- (i) The packaging requirements specified in USA:16 CFR §1700.15(b)(1).
- (ii) EN 862.
- (iii) AS 5808.
- (iv) IEC 60086-4.
- (v) The packaging passes the tests described in [Appendix C](#).

2.3.3 Multi-battery packaging

Each battery in a multi-battery package shall be individually contained.

Each battery containment in a multi-battery package shall meet the requirements of [Clause 2.3.2](#) even when another battery has been removed from the packaging.

2.4 Packaging-marking

2.4.1 Visibility

The safety labelling on the packaging shall be prominent, clearly visible, easily legible, understandable and indelible, so that it draws the attention of the consumer.

NOTE For further information regarding legibility, refer to ISO 3864-2.

[SOURCE: ACCC, Consumer Goods (Button/Coin Batteries) Information Standard 2020 ([legislation.gov.au](#)), Clause 9, modified, under CC BY 4.0]

2.4.2 Content

[SOURCE: ACCC, Consumer Goods (Button/Coin Batteries) Information Standard 2020 ([legislation.gov.au](#)), Clause 9, modified and Consumer Goods (Products Containing Button/Coin Batteries) Information Standard 2020 ([legislation.gov.au](#)), Clause 8, modified, under CC BY 4.0]