

Code of practice for

Safe operation of alkaline secondary cells and batteries

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- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA)
- British Battery Makers' Society
- British Industrial Truck Association
- British Railways Board
- British Telecom
- Electric Vehicle Association of Great Britain
- Electricity Supply Industry in England and Wales
- Health and Safety Executive
- Institute of Wastes Management
- London Transport Executive
- Ministry of Defence
- Society of Motor Manufacturers and Traders Limited
- Coopted members

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Foreword

This code of practice has been prepared in conjunction with the battery manufacturers under the direction of the Light Electrical Engineering Standards Committee. It provides guidance to users of alkaline secondary cells and batteries on safety and health aspects associated with such cells and batteries. It will be of particular interest to those users who are unfamiliar with battery technology.

It is intended that the code will be revised with an extended scope as and when other types of alkaline secondary batteries come into general use.

Attention is drawn to the following.

The Health and Safety at Work Act 1974

HS (R) 11 First Aid at Work

Electricity (Factories) Act Special Regulations 1908

The European agreement concerning the international carriage of dangerous goods by road

The International Regulations concerning the carriage of dangerous goods by rail. Department of Transport

The Merchant Shipping (Dangerous Goods) Regulations 1981. Statutory Instrument 1981 No. 1747

International Maritime Organization (IMO), London. International Maritime Dangerous Goods Code Volume IV

Department of Trade, Carriage of Dangerous Goods in Ships. Report of the Standing Advisory Committee 1978. The Blue Book

International Air Transport Association. Restricted Articles Regulations. Corrosive Products: Batteries

Packaging and Labelling of Dangerous Substances Act 1978

Protection of Eyes Regulations 1974

Control of Pollution (Special Wastes) Act 1980

Control of Pollution Act 1974

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

CAUTION. The general handling and use of alkaline secondary cells and batteries is not hazardous provided sensible precautions are taken. It is essential that the correct facilities are available and that operators and users are correctly instructed in their use.

1 Scope

This code gives brief recommendations for the safety and health aspects associated with the handling, usage and maintenance of alkaline secondary cells and batteries including accommodation and transportation. Cells and batteries used in certain applications, e.g. aircraft, marine and hazardous areas are subject to special provisions not necessarily covered by this code.

Traction batteries are covered by BS 6287 and a British Standard dealing with starter batteries is in course of preparation.

This code does not cover manufacture of alkaline cells or batteries but many aspects may in fact be relevant.

This code does not cover the use of alkaline cells and batteries in potentially explosive atmospheres.

NOTE The titles of the publications referred to in this code are listed on the inside back cover.

2 Definitions

For the purposes of this code the following definitions apply.

2.1

secondary cell and battery

a voltaic (galvanic) cell or battery which, after discharge, can be brought back to its initial (charged) condition by passing a current through it in the reverse direction to that of discharge

NOTE For the purposes of this code the word battery will be used to indicate cells and batteries.

2.2

electrolyte

a liquid or solid phase containing mobile ions which render the phase ionically conductive

2.3

alkaline secondary battery (nickel-cadmium or nickel-iron)

a battery in which the electrolyte is an alkaline solution

2.4

open cell

a secondary cell having a permanent cover provided with an opening through which gaseous products may freely escape. The opening may be fitted with a vent plug

2.5

sealed cell

a cell which is sealed under normal conditions, but allows the escape of gas if the internal pressure exceeds a critical value

2.6

r.m.s. current

the square root of the mean value of the squares of the instantaneous values of current taken over a complete cycle

2.7

mean current

the algebraic sum of the instantaneous values of a current taken over a period divided by the number of values taken

3 Health and safety precautions

Recommendations for health and safety precautions for alkaline secondary cells and batteries are as given in Table 1.

Table 1 — Health and safety precautions for alkaline secondary cells and batteries

Subject	Alkaline batteries	
	Open cells	Sealed cells
3.1 Safety and health of personnel	Personnel who are required to handle batteries should receive adequate training and instruction in relation to batteries generally as well as in their particular job associated with batteries. Refresher training should be given at regular intervals. All personnel involved with batteries at all stages of installation, use, maintenance, repair or disposal should wear appropriate safety clothing such as wellington boots, rubber apron, anti-splash eye protectors and rubber gloves^a. If woven materials are used natural fibres are preferred.	As for open.
3.2 Electrolyte Composition	An aqueous solution of potassium hydroxide (KOH) often containing a small percentage of lithium hydroxide. Normal strength is usually between 20 % and 25 % KOH <i>m/m</i> ; the strength does not significantly alter with the state of the charge.	Electrolyte composition for sealed cells is similar to that for open cells but the design of sealed cells does not allow the operator to come in contact with electrolyte unless the cell is damaged or misused.
Nature of the hazard	Electrolyte is corrosive and toxic and will cause burns and irritation to the skin and particularly to the eyes.	As for open.
Precautions	Handle batteries with care and keep open batteries upright.	Handle batteries with care.
Filling	Do not overfill open batteries and charge in well ventilated area (see also 3.3). Use eye protection and protective clothing where there is a risk of splashing.	Not applicable.
Accident or emergency action treatment ^b	<i>Skin contact.</i> Immediately wash the affected area with clean running water and remove any contaminated clothing or adornments. If any soreness or irritation persists seek medical advice. <i>Eye contact.</i> If an electrolyte splash in the eye has occurred, flood the eye immediately, and copiously, using an eye wash bottle or mains tap water. The eye wash bottles should be disposable sterile eye irrigators or sterile saline solution bottles. They should be provided in or adjacent to every place where any maintenance (including topping up) is carried out.	As for open. As for open.

^a See Protection of Eyes Regulations 1974.^b See booklet 'HS (R) II First Aid at Work', published by the Health and Safety Executive and available from HMSO.