

# INTERNATIONAL STANDARD

# IEC 60086-4

Second edition  
2000-03

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## Primary batteries –

### Part 4: Safety of lithium batteries

*Piles électriques –*

*Partie 4:  
Sécurité des piles au lithium*

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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## PRIMARY BATTERIES –

### Part 4: Safety of lithium batteries

#### FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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International Standard IEC 60086-4 has been prepared by IEC technical committee 35: Primary cells and batteries.

This second edition cancels and replaces the first edition, published in 1996, and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
35/1114/FDIS	35/1125/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B and C are for information only.

IEC 60086 consists of the following parts, under the general title Primary batteries:

- Part 1: General
- Part 2: Specification sheets
- Part 3: Watch batteries
- Part 4: Safety of lithium batteries
- Part 5: Safety of batteries with aqueous electrolyte

The committee has decided that the contents of this publication will remain unchanged until 2002.

At this date the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

Withdrawn

## INTRODUCTION

The concept of safety is closely related to safeguarding the integrity of people and property. This standard specifies requirements and tests for lithium batteries and has been prepared in accordance with ISO/IEC guidelines, taking into account all relevant national and international standards which apply.

Lithium batteries are different from conventional primary batteries using aqueous electrolyte in that they contain flammable materials.

Consequently, it is important to take safety precautions very carefully during design, production, distribution, use, and disposal of lithium batteries. Based on such special characteristics, lithium batteries for consumer applications were initially small in size and had low power output. There were also lithium batteries with high power output which were used for special industrial applications and were characterized as being “technician replaceable”.

The first edition of IEC 60086-4 (1996) was drafted to accommodate the above situation.

However, from around the end of the 1980s, lithium batteries with high power output have started to be widely used in the consumer replacement market, mainly as a power source in camera applications.

Since the demand for such lithium batteries with high power output has significantly increased in recent years, various manufacturers have started to produce these types of lithium batteries. As a consequence of this situation, the safety aspects for lithium batteries with high power output have been included in this second edition of IEC 60086-4.

Safety is a balance between freedom from hazard and other requirements to be met by the product. There can be no absolute safety. Even at the highest level of safety, the product can only be relatively safe. In this respect, decision-making is based on risk evaluation and safety judgement.

As safety will pose different problems, it is impossible to provide a set of precise provisions and recommendations that will apply in every case. However, this standard, when followed on a judicious “use when applicable” basis, will provide reasonably consistent standards for safety.

## PRIMARY BATTERIES –

### Part 4: Safety of lithium batteries

#### 1 Scope

This International Standard specifies tests and requirements for primary lithium batteries to ensure their safe operation under intended use and reasonably foreseeable misuse.

#### 2 Normative reference

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60086-1:1996, *Primary batteries – Part 1: General*

Withdrawn