



BSI Standards Publication

## Opportunity charging of lead-acid traction batteries

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## National foreword

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The UK participation in its preparation was entrusted to Technical Committee PEL/21, Secondary cells and batteries.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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# TECHNICAL SPECIFICATION

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## Opportunity charging of lead-acid traction batteries

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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**OPPORTUNITY CHARGING OF LEAD-ACID  
TRACTION BATTERIES**

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IEC TS 61044 has been prepared by IEC technical committee 21: Secondary cells and batteries. It is a Technical Specification.

This first edition cancels and replaces the second edition of IEC TR 61044 published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the recommended depth of discharge for opportunity charging has been adjusted;
- b) a distinction is made between valve regulated lead-acid batteries (VRLA) and vented lead-acid batteries.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
21/1081/DTS	21/1088/RVDTS

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

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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- withdrawn,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

## INTRODUCTION

Lead-acid traction batteries find a widespread application in industrial transportation vehicles because of their particular properties of providing a reliable power supply source with a very low environmental impact.

In such applications, both monitoring and power management by electronic means have made great strides not only on the discharge side of the energy balance but during charging as well.

This progress permits refuelling, i.e., charging of a lead-acid traction battery in a well-controlled manner during idle periods in the course of a working schedule.

As a result, the total capacity or ampere-hour output of the lead-acid battery increases per working day substantially beyond the manufacturer's maximum recommended value.

However, such opportunity charging will provide improved capital efficiency only if adequate precautions are taken to prevent premature deterioration of the state of the lead-acid traction battery caused by such a practice.

This document is intended to present requirements, derived from the field experience of battery manufacturers in general and from opportunity charging of lead-acid traction batteries in particular, with the aim of preventing detrimental effects on batteries and industrial equipment.

# OPPORTUNITY CHARGING OF LEAD-ACID TRACTION BATTERIES

## 1 Scope

This document covers opportunity charging of lead-acid traction batteries, i.e., the use of idle time during a working period to increase the state of charge (SoC) so as to extend the daily working period of a lead-acid traction battery while at the same time avoiding an excessive depth of discharge.

This document specifies requirements for the use of opportunity charging of lead-acid traction batteries of vented and valve regulated types when the battery manufacturer has not provided alternative specific operating procedures.

This document is only applicable for lead-acid traction batteries of vented and valve regulated design for which the battery manufacturer has not provided specific operating procedures.

## 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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62485-3:2014, *Safety requirements for secondary batteries and battery installations – Part 3: Traction batteries*

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 3.1

#### **opportunity charging**

use of periods of inactivity of a partially discharged battery to increase its state of charge

Note 1 to entry: Opportunity charging at a state of charge (SoC) of > 70 % is less effective and can result in a significant increase of battery temperature and water loss.

### 3.2

#### **regular charge**

charge of a battery as specified by the manufacturer necessary to attain the state of maximum storage of electric energy

### 3.3

#### **self-compensating charger**

device which supplies charge, monitors the state of charge, and terminates the charge of the battery when the correct amount of electric charge has been supplied