



DPC: 24/30488465 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 01 March 2024

Origin: European

Latest date for receipt of comments: 24 April 2024

Project No. 2024/00672

Responsible committee: PEL/21 Secondary cells and batteries

Interested committees:

Title: Draft BS EN 50342-5 Lead-acid starter batteries. Part 5: Mechanical properties of battery housings and handles.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 24 April 2024

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.

Information on the co-operating organizations represented on the committees referenced above may be obtained from <https://standardsdevelopment.bsigroup.com/>.

Responsible Committee Secretary: Ms Nicola Young (BSI)

Direct tel:

E-mail: nicola.young@bsigroup.com

Full document details: 24/30488465 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

March 2024

ICS 29.220.20

Will supersede EN 50342-5:2010; EN 50342-5:2010/AC:2011

English Version

Lead-acid starter batteries - Part 5: Mechanical properties of battery housings and handles

Batteries d'accumulateurs de démarrage au plomb - Partie 5: Propriétés mécaniques des boîtiers et poignées de batteries

Blei-Akkumulatoren-Starterbatterien - Teil 5: Mechanische Eigenschaften von Batteriegehäusen und Griffen

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-05-24.

It has been drawn up by CLC/TC 21X.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

1	European foreword.....	3
2	1 Scope	4
3	2 Normative references	4
4	3 Terms and definitions	4
5	4 Properties of raw materials.....	5
6	4.1 General.....	5
7	4.2 Resistance against chemical substances.....	5
8	5 Production of battery housings	6
9	5.1 General.....	6
10	5.2 Test on disruptive strength	6
11	5.3 Warm storage.....	7
12	5.4 Heat resistance test.....	7
13	6 Mechanical properties of batteries	8
14	6.1 General.....	8
15	6.2 Top load test	8
16	6.3 Impact test.....	9
17	6.4 Strength of the handles tested with continuous load.....	11
18	6.5 Strength of the handle tested with sudden load	12
19	6.6 Hardness of hold-downs for bottom fixation.....	13
20	6.7 Temperature change	15
21	Annex A (normative) Mandatory tests and requirements to prove compliance with EN 50342-5.....	16
22	Annex B (informative) Datasheet 'Material for battery housings'	17
23	Annex C (informative) Datasheet 'Specimen of battery container'	19
24	Annex D (informative) Statistical analysis and damage score calculation of impact test results.....	20
25	D.1 General.....	20
26	D.2 Definition of defects	20
27	D.3 Examples of defects	20
28	D.4 Calculation scheme	21
29	D.5 Evaluation.....	21
30	D.6 Example	21
31	Annex E (informative) Laboratory setup to test resistance against chemical substances	23
32	Annex F (informative) Drawing of adapter for pulling device	24

33 **European foreword**

34 This document (prEN 50342-5:2024) has been prepared by CLC/TC 21X, "Secondary cells and batteries".

35 This document is currently submitted to the Enquiry.

36 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

37 This document will supersede EN 50342-5:2010 and all of its amendments and corrigenda (if any).

1 Scope

This document is applicable to housing and accessory parts of lead-acid batteries made of polypropylene. Lead-acid batteries are used primarily as a power source for the starting of internal combustion engines, lighting and for auxiliary equipment of road vehicles. These batteries are all referred to as starter batteries.

This document is applicable to starter batteries for passenger cars and for commercial or industrial vehicles.

Battery housing and accessory parts according to this document do not provide any protection of the polypropylene against aging due to light. The parts are intended to be used within the engine compartment or within battery boxes where they are protected from light.

The purpose of this document is to define requirements for raw material used to produce housing and accessory parts for starter batteries, to define requirements of the physical properties of battery housing and to define uniform test procedures for validation.

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.

EN 50342-2, *Lead-acid starter batteries - Part 2: Dimensions of batteries and marking of terminals*

EN 50342-4, *Lead-acid starter batteries - Part 4: Dimensions of batteries for heavy vehicles*

IEC 60050-482, *International Electrotechnical Vocabulary – Part 482: Primary and secondary cells and batteries*

EN ISO 527-1, *Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1)*

EN ISO 527-2, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-482 and the following apply.

3.1

battery case

container for the plate pack or packs and electrolyte of a cell or cells made of a material impervious to the electrolyte

[SOURCE: IEC 60050-482-02-14]

3.2

cell lid

battery lid

part used to close the case normally having holes for filling, topping-up, gas escape, terminals, etc

[SOURCE: IEC 60050-482-02-15]

3.3

battery housing

entity made of a battery case and a battery lid, intended to be welded together

3.4**battery accessories**

any item coming on top of the battery housing (i.e. handles, plugs, etc.)

3.5**raw material**

material defined by the substance used for the production of the battery housing and accessories

Note 1 to entry: It can be polypropylene (PP), polyethylene (PE) or a mixture of both. Raw material can be either a virgin material or a recycled, regenerated or regrind material.

3.6**hold-down**

ledge at the lower part of the battery case for fixation within vehicle

Note 1 to entry: See EN 50342-2 and EN 50342-4 for dimensions.

4 Properties of raw materials**4.1 General**

The examination of the raw materials should be performed in accordance to the specifications shown in Annex B. If not agreed otherwise, the results need to be documented in a corresponding material specification.

Test methods are based on international ISO standards. The needed specimens for the individual examination are given in Annex B.

The specimens shall be stored before starting any test for at least 4 days at $(23^\circ \pm 0,5)^\circ\text{C}$ and shall be tested within 3 months.

Annex C recommends possible test procedures for the material properties taken out of the battery housing, without being normative.

4.2 Resistance against chemical substances

The purpose of this test is to check if chemical substances which might be present in the vicinity of batteries and have some chemical affinity to PP can significantly weaken the material properties.

The test shall be carried out on specimens 5A according to EN ISO 527-2. The specimens are prepared by injection moulding and shall be aged at 100°C for 4d before starting the test.

Each sample shall be weighed and all samples for one liquid are treated together under reflux at a temperature and time according to Table 1.

In Annex E a laboratory equipment for heat treatment under reflux is depicted.

For statistical reasons the test shall be carried out on at least 6 samples

After treatment each sample shall be dried, weighed and tested on tensile strength at yield according to EN ISO 527-1.

The maximum change in weight and tensile strength at yield compared to the initial data, before treatment with chemicals, is given in Table 1.

111

Table 1 — Resistance against chemicals

Substance	Test temperature °C	Test time h	Maximum change in weight %	Maximum change in tensile at yield %
Synthetic motor oil	70	72	10	- 20
Gasoline ^a > 95 ROZ	70	72	10	-30
Diesel ^b	70	72	20	-30
Biodiesel ^c (Rape seed methyl ester)	70	72	15	-30
Brake fluid DOT 4	70	72	1	±5
Cooling agent (Commercial mixture)	70	72	< 0,5	±5
Sulphuric acid 1,28 g/ml at 25 °C	70	1 000	< 0,5	±5
^a According to EN 228 ^b According to EN 590 ^c According to EN 14214				

112 **5 Production of battery housings**

113 **5.1 General**

114 The test procedures in this section are intended to check characteristics of battery cases and battery lids
115 during production. They might be used to judge the quality after injection moulding of these components.
116 These tests are not relevant any more for finished batteries after completion of the production process.

117 **5.2 Test on disruptive strength**

118 **5.2.1 General**

119 Purpose of this test is to prove an injection quality without risk of acid leakage by small holes.

120 **5.2.2 Apparatus**

121 Commercial high voltage generator with test electrodes. In most cases this are two adjacent plates.
122 Electrodes with brush design can be beneficial. The electric field is higher on the surface of a tip but
123 decreases with square of distance. The setup of the system shall be checked and confirmed by experiment.

124 The voltage shall be adjustable up to (25 ± 2) kV DC or AC sinus peak to peak with a frequency of (50 ± 10)
125 Hz. The maximum output current of the generator shall be adjustable to a current limit ≤ 1 mA.

126 **5.2.3 Procedure**

127 The sample to be tested shall be dry. It shall be positioned between the test electrodes in a way, that one
128 electrode contacts the internal side, the other the outer side of the sample.

129 The applied voltage shall be adjusted to generate an electric field strength of at least 5 kV / mm up to about
130 10 kV / mm.