



JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

---

---

JIS D 5302 : 2022

(JSA)

Lead-acid batteries for motorcycles

---

ICS 29.220.20 ; 43.140

Reference number : JIS D 5302 : 2022 (E)

PROTECTED BY COPYRIGHT

D 5302 : 2022

Date of Establishment: 1951-11-28

Date of Revision: 2022-05-20

Date of Public Notice in Official Gazette: 2022-05-20

Developed by: Japanese Standards Association

Investigated by: JIS Development Committee on Electricity Technology

---

JIS D 5302 : 2022, First English edition published in 2024-04

Translated and published by: Japanese Standards Association  
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

---

In the event of any doubts arising as to the contents,  
the original JIS is to be the final authority.

© JSA 2024

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

HN  
 **Documents**  
Document Sharing Hub

## Contents

## Page

|                                                                                                       |    |
|-------------------------------------------------------------------------------------------------------|----|
| Introduction .....                                                                                    | 1  |
| 1 Scope .....                                                                                         | 1  |
| 2 Normative references .....                                                                          | 1  |
| 3 Terms and definitions .....                                                                         | 2  |
| 4 Condition on delivery .....                                                                         | 4  |
| 4.1 VRLA battery .....                                                                                | 4  |
| 4.2 Flooded battery .....                                                                             | 4  |
| 5 General requirements .....                                                                          | 4  |
| 5.1 Structure .....                                                                                   | 4  |
| 5.2 Identification and labelling .....                                                                | 5  |
| 5.3 Marking of polarity .....                                                                         | 6  |
| 6 General test conditions .....                                                                       | 6  |
| 6.1 Sampling of batteries .....                                                                       | 6  |
| 6.2 Charging of batteries .....                                                                       | 6  |
| 6.3 Test equipment .....                                                                              | 7  |
| 6.4 Test sequence .....                                                                               | 8  |
| 7 Test methods .....                                                                                  | 9  |
| 7.1 10 h capacity test .....                                                                          | 9  |
| 7.2 Cranking performance test .....                                                                   | 10 |
| 7.3 Charge acceptance test .....                                                                      | 10 |
| 7.4 Charge retention test .....                                                                       | 10 |
| 7.5 Endurance test .....                                                                              | 11 |
| 7.6 Water consumption test .....                                                                      | 11 |
| 7.7 Vibration resistance test .....                                                                   | 12 |
| 7.8 Cranking performance test for dry-charged batteries .....                                         | 12 |
| 8 Requirements .....                                                                                  | 12 |
| Annex A (normative) Battery size .....                                                                | 14 |
| Annex JA (informative) Designation of batteries .....                                                 | 18 |
| Annex JB (informative) Comparison table between JIS and corresponding<br>International Standard ..... | 21 |

## Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by Japanese Standards Association (JSA), an accredited standards development organization. This edition replaces the previous edition (**JIS D 5302** : 2004), which has been technically revised.

This **JIS** document is protected by the Copyright Act.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister is not responsible for identifying any of such patent rights, published patent application or utility model rights.

# Lead-acid batteries for motorcycles

## Introduction

This Japanese Industrial Standard has been prepared based on **IEC 60095-7 : 2019**, Edition 1 by modifying some of the technical contents in consideration of motorcycles in widespread use in Japan.

Annex JA is unique to **JIS** and not given in the corresponding International Standard.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JB.

## 1 Scope

This Standard is applicable to lead-acid batteries (hereafter referred to as batteries) used primarily as a power source for the starting of internal combustion engines, lighting and ignition of motorcycles and other power sport vehicles with a nominal voltage of 12 V or 6 V. This Standard specifies general requirements, as well as size requirements, essential electrical characteristics, relevant test methods and results required. Test definitions and criteria in this Standard are for batteries with a nominal voltage of 12 V only. For batteries with a nominal voltage of 6 V, all voltages have to be divided by two. This Standard covers requirements for flooded batteries and valve regulated lead-acid batteries (VRLA batteries). The other power sports vehicles covered in this Standard are snowmobiles, personal water crafts and all-terrain vehicles (ATV). This Standard is not applicable to batteries for other purposes, such as the back-up power sources, auxiliary equipment of internal combustion engine vehicles and e-bikes.

**NOTE** The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

IEC 60095-7 : 2019 *Lead-acid starter batteries — Part 7 : General requirements and methods of test for motorcycle batteries* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

## 2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 7414 *Glass thermometers*

JIS B 7507 *Geometrical product specifications (GPS) — Dimensional measuring equipment — Vernier dial and digital callipers*

JIS B 7525-1 *Hydrometers — Part 1 : Density hydrometers*

JIS C 1102-2 *Direct acting indicating analogue electrical measuring instruments and their accessories Part 2 : Special requirements for ammeters and voltmeters*

JIS C 3406 *Low-voltage cables for automobiles*

JIS K 6999 *Plastics — Generic identification and marking of plastics products*

### 3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

#### 3.1

##### **full charge**

state of battery charge such that the charging produces no increase of capacity

Note 1 to entry It indicates the state of a battery charged in accordance with 6.2.

#### 3.2

##### **nominal voltage**

voltage used to designate a battery voltage

Note 1 to entry Generally, a voltage slightly lower than the electromotive force at a full charge is applied. For the batteries, it is 2 V per unit cell.

Note 2 to entry It is expressed in volts (V).

#### 3.3

##### **nominal 10 h capacity, $C_{10,n}$**

10 h rate capacity specified by the manufacturer

Note 1 to entry It is the specified electric quantity that a fully charged battery can supply with the nominal 10 h current (3.4) to an end-of-discharge voltage of 10.5 V at 25 °C.

Note 2 to entry It is expressed in ampere hours (Ah).

#### 3.4

##### **nominal 10 h current, $I_{10,n}$**

current equal to the nominal 10 h capacity (3.3) divided by ten hours

Note 1 to entry The current value specified for a battery to indicate the magnitude of its charging and discharging current.

Note 2 to entry It is expressed in amperes (A).

#### 3.5

##### **effective 10 h capacity, $C_{10,e}$**

nominal 10 h current (3.4) multiplied by the discharge duration until a fully charged battery reaches  $10.50 \text{ V} \pm 0.05 \text{ V}$  at an ambient temperature of  $25 \text{ }^{\circ}\text{C} \pm 2 \text{ }^{\circ}\text{C}$  (see 7.1)

Note 1 to entry The resulting value is used to check conformity of a battery by comparison with  $C_{10,n}$  (see Table 3).

Note 2 to entry It is expressed in ampere hours (Ah).

### 3.6

#### **end-of-discharge voltage**

voltage of a battery terminal at which the battery discharge is terminated

Note 1 to entry It is expressed in volts (V).

### 3.7

#### **nominal cold cranking current, $I_{cc}$**

current used as a scale expressing the engine cranking performance of battery, which is specified to be discharged at a temperature of  $-18 \text{ }^{\circ}\text{C}$  with the terminal voltage 30 s after the start of discharge being 7.2 V or over

Note 1 to entry It is expressed in amperes (A).

### 3.8

#### **charge acceptance**

characteristics of a discharged battery which shows the ease of increasing its state of charge

Note 1 to entry It uses as its index the charging current  $I_{ca}$  measured under specified conditions (see 7.3).

### 3.9

#### **shallow cycle endurance**

in the life test method, the life performance of a battery after repeated cycles of discharge and charge in the light load region with a single discharge depth of 10 % or less (see 7.5 for reference)

### 3.10

#### **water consumption**

characteristics of a battery where its electrolyte is decreased during overcharge (see 7.6)

### 3.11

#### **vibration resistance**

ability of a battery to maintain service under periodic or irregular acceleration rate

### 3.12

#### **charge retention**

cranking performance of a filled charged battery which has been stored on open circuit under specified temperature and time conditions (see 7.4)

### 3.13

#### dry-charged batteries

batteries into which the appropriate electrolyte is transferred for activation, immediately prior to use

## 4 Condition on delivery

### 4.1 VRLA battery

The VRLA batteries may be supplied in either of the following states.

- a) In a state ready for use filled with a suitable electrolyte. The density of the electrolyte in fully charged batteries, unless otherwise recommended by the manufacturer, shall be  $1.32 \text{ g/cm}^3 \pm 0.01 \text{ g/cm}^3$  at  $25^\circ\text{C}$ . For these batteries, the electrolyte is not accessible and, therefore, its density cannot be checked.
- b) In a dry-charged state not filled with electrolyte. The density of the electrolyte to fill these batteries before use shall be as given in a).

### 4.2 Flooded battery

The flooded batteries may be supplied in either of the following states.

- a) In a state ready for use filled with a suitable electrolyte up to the maximum liquid level indicator. The density of the electrolyte in fully charged batteries, unless otherwise recommended by the manufacturer, shall be  $1.28 \text{ g/cm}^3 \pm 0.01 \text{ g/cm}^3$  at  $25^\circ\text{C}$ .
- b) In a dry-charged state not filled with electrolyte. The density of the electrolyte to fill these batteries before use shall be as given in a).

## 5 General requirements

### 5.1 Structure

#### 5.1.1 General

The battery shall be composed of a positive plate, a negative plate, a separator, electrolyte, an electrolytic container, a lid, etc. The battery shall have a structure such that the electrolytic container and lid are bonded and sealed tightly by welding or with a sealing material, and unit cells are connected with each other. The battery shall be equipped with both one positive terminal and one negative terminal. The flooded battery shall be provided with a maximum liquid level indicator and a minimum liquid level indicator, and VRLA battery shall be structured such that the negative plate absorbs the oxygen gas emitted from the positive plate by reaction at the negative plate, thereby eliminating the need for rehydration.

#### 5.1.2 Terminals

The standard terminal shall be manufactured using lead alloy, and for a battery

having a bolt and nut, the terminal shall be mounted. However, for a battery whose outside dimensions are small, a lead wire type may be used instead of a terminal. As regards this lead wire, an electric wire specified in **JIS C 3406**, etc. shall be used, and as a wire covering colour, red shall be used for the positive polarity side and black for the negative polarity side. The VRLA batteries may employ flat type connection terminals.

**NOTE** The standard practice is to attach bolts and nuts of M5 to batteries less than 7 Ah in capacity, and of M6 to batteries of 7 Ah or over in capacity.

## 5.2 Identification and labelling

### 5.2.1 General

Batteries according to this Standard shall bear the characteristics described from 5.2.2 to 5.2.8 on at least one of their sides or on the top surface.

### 5.2.2 Identification of manufacturer or its abbreviation

The name of the manufacturer or its abbreviation shall be indicated.

### 5.2.3 Nominal voltage : 6 V or 12 V

The nominal voltage of 6 V or 12 V shall be indicated.

### 5.2.4 Nominal 10 h capacity, $C_{10,n}$

The nominal 10 h capacity,  $C_{10,n}$ , shall be indicated.

### 5.2.5 Year and month of manufacture, manufacturing date or its abbreviation

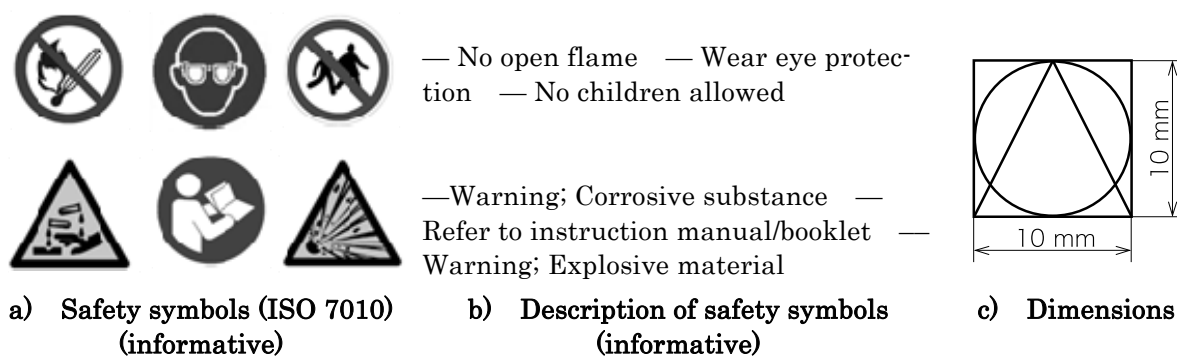
The year and month of manufacture, manufacturing date or its abbreviation shall be indicated.

See the following example of an abbreviation indicating the manufacturing date.

|         |       |         |        |                   |
|---------|-------|---------|--------|-------------------|
| Example | 28    | 03      | 20     | (28, March, 2020) |
|         | (Day) | (Month) | (Year) |                   |

### 5.2.6 Safety labelling

The batteries shall be given safety-related symbols that are 10 mm or more in side length as shown in Figure 1 c). The description of safety symbols shown in Figure 1 b) should be stated in the vicinity of the symbols. The graphical symbols used should be as specified in **ISO 7010** [see Figure 1 a), b)].



NOTE For the colours of the symbols, see P003, M004, P036, W023, M002 and W002 in ISO 7010.

Figure 1 Safety labelling

### 5.2.7 Marking of material

For marking of material for separate collection and recycling, see JIS K 6999.

Example >PP/PE<

### 5.2.8 VRLA battery

VRLA batteries shall be marked to indicate that they are VRLA batteries. In addition, to prevent hydration attempts, it is recommended that VRLA batteries bear special indication that the battery shall not be opened.

Example VRLA — DO NOT OPEN

### 5.3 Marking of polarity

The batteries shall carry the marking of polarity, at least of the positive terminal. The marking of positive polarity shall take the form of the symbol “+” positioned adjacent to the positive terminal or on the positive terminal. If the negative polarity is also marked, the marking shall take the form of the symbol “-” positioned adjacent to the negative terminal or on the negative terminal.

## 6 General test conditions

### 6.1 Sampling of batteries

A required number of batteries as follows shall be sampled and used for all the tests.

- Batteries not older than 45 days after the production date of the manufacturer in the case of filled batteries
- Batteries not older than 60 days after the production date of the manufacturer in the case of dry-charged batteries.

### 6.2 Charging of batteries

#### 6.2.1 General

Batteries shall be charged by either of the following method 6.2.2 or 6.2.3, unless otherwise recommended by the manufacturer. Batteries shall be considered as fully