

GOLD-IBT



TESTING SLA BATTERIES



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Intro

INTRODUCTION

This information sheet defines how to inspect, test and store sealed lead acid (SLA) batteries.

You will learn how battery Ampere hour (Ah) capacity is directly affected by battery temperature, age and state of charge.

1. BATTERY TYPES

There are two common types of SLA battery, General Standby (permanently charged) and Cyclic Use (charged, then discharged).

2. GENERAL STANDBY

Standby SLA batteries are designed to be normally permanently charged. Applications include security, fire, UPS and telecommunication standby systems. In the event of mains failure, they are designed to provide 1/20th of the stated capacity for 20 hours (e.g. 7Ah/20 = 350mA).

IMPORTANT: To avoid damage, standby batteries should not be deep discharged below 10.5 volts.

3. CYCLIC USE

Cyclic SLA batteries are designed to be charged then deep discharged repeatedly. Applications include mobility scooters and golf carts.

IMPORTANT: To avoid damage, cyclic batteries must be fully recharged immediately after use.

SLA batteries normally self-discharge at 3% per month and so must be fully recharged when the voltage drops below 12.30 volts.

4. BATTERY TECHNOLOGY

There are two types of SLA technology, AGM and GEL.

In AGM (Absorbed Glass Mat) sealed batteries, an electrolyte paste is absorbed between the plates and a fibreglass mat. AGM technology is cheaper to produce than GEL and accounts for the vast majority of SLA sales. Applications include general standby and motor vehicles.

In GEL sealed batteries, a silica additive causes the electrolyte liquid to stiffen. GEL technology provides less instant energy than AGM but gives greater long term energy delivery. Applications include mobility scooters and golf carts.

5. BATTERY 'C' RATING

In addition to the stated voltage and Ah capacity, SLA batteries have a 'C' rating designed to meet specific load applications such as C5, C10 and C20.

The vast majority of SLA batteries are rated C20 which means they are designed to provide 1/20th of the stated Ah capacity for 20 hours to 10.5 volts. For example, 7Ah/C20 = 350mA load for 20 hours.

If the 'C' rating is not specified consult the battery manufacturer.

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6. DATE CODE

Manufacturers use different codes to decipher the date of production which is normally stamped on the battery. It is important to decipher this date code for inventory rotation purposes and to ensure you don't have power supply problems caused by installing old self-discharged stock.

7. EXAMPLE CODES

Below are three date code examples of premium brand 12 volt/7Ah SLA batteries:

- a) Genesis Code 050308G = Mar 8th 2005
- b) Power-Sonic Code 02065-L = Jun 2nd 2005
- c) Yuasa Code 0603173B = Mar 17th 2006

If you cannot decipher the date code contact the battery manufacturer.

8. VISUAL INSPECTION

If an SLA battery shows any sign of white residue leakage around the cells or battery terminals it is defective and must be replaced.

If a battery in service rattles when shaken it is faulty and must be replaced and recycled.

9. SELF DISCHARGE

SLA batteries are not supplied fully recharged when they leave the factory. They also normally self discharge at 3% per month during shipping and storage.

It is therefore very important to test the battery voltage and Ah capacity before installation.

10. THE GOLD-IBT

The award winning GOLD-IBT from ACT Meters simulates a 20 hour battery discharge test in 6 seconds without flattening the battery.

11. TEST PROCEDURE

- Step 1: Observing polarity, connect the GOLD-IBT clips tightly to the red+, black- terminals of the 12v SLA battery.
- Step 2: A 12v SLA battery that shows less than 12.30 volts is defective and must be charged and re-tested before use.
- Step 3. Using the table on the side of the tester, confirm that the Ah capacity available is above 65%

12. TERMINAL CONNECTIONS

There are two common types of battery terminals, raised and recessed.

The GOLD-IBT clips are specially designed to grip tightly around raised tab, round or flat battery terminals.

IMPORTANT: When testing recessed battery terminals, accessory part ACT3532 must be used to obtain accurate, repeatable Ah readings. Connecting to high resistance steel screws or bolts will drastically reduce Ah readings.

13. BATTERY CAPACITY

When testing brand new, 'out of the box' batteries, the stated Ah capacity is normally reached when the battery temperature is between 20 and 25C (68 - 77F)

The available Ah capacity in 'batteries in service' is determined by battery temperature, age and state of charge. As a result, the Ah capacity can be significantly higher or lower than stated.

14. BATTERY LIFE

For maximum life and performance, a standby SLA battery should be maintained at a constant 20 to 25C (68 - 77F) temperature and charged at a constant 13.8VDC (2.3 volts per cell).

Under these conditions, an SLA battery should have 90% of its stated Ah capacity after 3 years, 65% after 4 years and 40% after five years.

15. BATTERY CHARGING

In order for 12 volt SLA batteries to charge fully, they must be charged at between 13.5VDC minimum and 14.0VDC maximum.

The time taken to fully charge will vary substantially depending on the Ah size of the battery. A flat battery after fully recharging should be allowed to rest for 24 hours before testing with the GOLD-IBT. Batteries that are on permanent charge can be tested immediately.

16. EQUAL CAPACITY

Where two 12 volt SLA batteries are connected in series for 24 volt fire alarms and mobility scooters, make sure that both batteries are the same brand, year of manufacture and Ah size.

To avoid charging problems, always replace both batteries if any significant Ah capacity imbalance.

17. SPECIALIST BATTERIES

The GOLD-IBT is designed to accurately measure the Ah capacity available in premium brand C20 rated AGM 12 volt SLA batteries from 1.2Ah to 200Ah.

It can also test specialist 12 volt SLA batteries with different 'C' rating or internal resistance by using a 'battery resistance adjustment figure'. The adjustment could be a +/- Ah figure.

IMPORTANT: The 'battery resistance adjustment figure' must be calculated by testing a brand new, out of the box SLA battery which has been stored at 20 to 25°C (68-77°F) for 24 hours.

Connect to the battery as described above in terminal connections and test the battery twice to verify the Ampere hour capacity. Calculate the adjustment factor required (e.g. GOLD-IBT reading = 17Ah, stated capacity = 31Ah, 'battery resistance adjustment figure' = +14). Use the same calculation figure when testing this specific type of specialist SLA battery.