

الهيئة السعودية للمواصفات والمقاييس والجودة  
Saudi Standards, Metrology and Quality Org (SASO)

SASO/DS/IEC 60095-1:2019/AMD1:2023

بطاريات الرصاص الحمضية لبدء التشغيل – الجزء 1: المتطلبات العامة وطرائق  
الاختبار

Lead-acid starter batteries – part1: General requirements and methods  
of test

ICS: 29.220.20

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THIS DOCUMENT IS A DRAFT AMENDMENT TO SAUDI STANDARD  
CIRCULATED FOR COMMENT. IT IS, THEREFORE SUBJECT TO  
CHANGE AND MAY NOT BE REFERRED UNTIL APPROVED BY THE  
BOARD OF DIRECTORS.

## Foreword

Saudi Standards, Metrology and Quality Organization (SASO) has adopted Standard No. (IEC 60095-1) "Lead-acid starter batteries – part1: General requirements and methods of test " issued by (IEC) in English. This standard has been approved as a Saudi Standard with national modifications.

Saudi Standards, Metrology and Quality Organization (SASO) has approved the Amendment of Standard No.(SASO/DS/IEC 60095-1:2019/AMD1:2023), (Lead-acid starter batteries – part1: General requirements and methods of test). This amendment has been approved as a complementary part of the Saudi Standard No (SASO IEC 60095-1:2019). Standard has been varied as indicated to take account of Kingdom of Saudi Arabia conditions.

## 6. Charging modes and functions

### 6.1.5 Production date

#### **Replace:**

Date code should be placed in English production on the top surface of the battery visibly and in a non-removable and put code in the following format:



xx/yy

#### **By:**

Date code should be placed in English production on the top surface of the battery visibly and permanently and put code in the following format:

xx/yy

## 9.7 Water consumption test

#### **Replace:**

This test applies only to vented batteries.

The battery, after being charged according to 8.2, shall be cleaned, dried and weighed to an accuracy of  $\pm 0,05$  % (W1).

The battery shall be placed in a water bath maintained at a temperature of  $40\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  according to the provisions of 8.3.2. The battery shall be charged at a constant voltage of  $14,40\text{ V} \pm 0,05\text{ V}$  (measured across the battery terminals) for a period of 500 h. Immediately after this overcharge period, the battery shall be weighed under the same conditions as initially, with the same scales (W2). The ratio  $(W1-W2)/C20$  shall be calculated and compared against the requirements listed in Table 6.

NOTE It is possible to carry out this test with a different temperature than  $40\text{ }^{\circ}\text{C}$  (for example  $60\text{ }^{\circ}\text{C}$ ); see the correlation formula between temperatures in Annex B.

#### **By:**

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The battery shall be charged at a constant voltage of  $14,40\text{ V} \pm 0,05\text{ V}$  (measured across the battery terminals) for a period of 500 h. Immediately after this overcharge period, the battery shall be weighed under the same conditions as initially, with the same scales (W2).

The ratio  $(W1-W2)/C20$  shall be calculated and compared against the requirements listed in Table

## 10 Requirements

**Table 6 – Summary of requirements**

**Replace:**

Functional characteristics	See paragraph	Requirements	Comments
20 h capacity	9.1	$C_e \geq C_{20}$	For batteries rated in Ah
Reserve capacity	9.2	$RC_e \geq RC_n$	For batteries rated in reserve capacity
Cranking performance test -18 °C	9.3.1	Option 1 (for batteries rated in Ah) $U_{10s} \geq 7,50 \text{ V}$ $t_{6V} \geq 90 \text{ s}$ Option 2 (for batteries rated in reserve capacity) $U_{30s} \geq 7,20 \text{ V}$	
Cranking performance test -29 °C	9.3.2	$U_{30s} \geq 7,20 \text{ V}$	Optional
Charge acceptance	9.4	$I_{ca} \geq 2I_0$	
Charge retention Normal batteries (N) and Low water loss batteries (L)	9.5	$U_{30s} \geq 8,0 \text{ V}$	
Charge retention Very low water loss batteries (VL)	9.5	$U_{30s} \geq 8,5 \text{ V}$	
Corrosion test	9.6.1.1	Number of units $\geq 4$	
Endurance in cycle test	9.6.1.2	Flooded (vented) $\geq 60$ cycles VRLA $\geq 250$ cycles	
Optional endurance in cycle test	9.6.2	Number of cycles = $34 \times RC_n - 581$	Optional
Water consumption Normal batteries (N)	9.7	No requirement	
Water consumption Low water loss batteries (L)	9.7	Maximum 4 g/Ah	
Water consumption Very low water loss batteries (VL)	9.7	Maximum 1 g/Ah	
Vibration	9.8	$U_{30s} \geq 7,2 \text{ V}$	
Electrolyte retention	9.9	No evidence of liquid on the vent plugs (or from the single point vent outlet)	
Cranking performance after activation	9.10	$U_{30s} \geq 7,2 \text{ V}$	

For both  $C_e$  or  $RC_e$  and the cranking performance, the specified values shall be met in at least one of the three relevant discharges above (see 9.1, 9.2, and 9.3).

**By:**

Functional characteristics	See paragraph	Requirements	Comments
20 h capacity	9.1	$C_e \geq C_{20}$	For batteries rated in Ah
Reserve capacity	9.2	$RC_e \geq RC_n$	For batteries rated in reserve capacity
Cranking performance test -18 °C	9.3.1	Option 1 (for batteries rated in Ah) $U_{10s} \geq 7,50 \text{ V}$ $t_{6V} \geq 90 \text{ s}$ Option 2 (for batteries rated in reserve capacity) $U_{30s} \geq 7,20 \text{ V}$	
Cranking performance test -29 °C	9.3.2	$U_{30s} \geq 7,20 \text{ V}$	Optional
Charge acceptance	9.4	$I_{ca} \geq 2I_0$	
Charge retention Normal batteries (N) and Low water loss batteries (L)	9.5	$U_{30s} \geq 8,0 \text{ V}$	
Charge retention Very low water loss batteries (VL)	9.5	$U_{30s} \geq 8,5 \text{ V}$	
Corrosion test	9.6.1.1	Number of units $\geq 4$	
Endurance in cycle test	9.6.1.2	Flooded (vented) $\geq 60$ cycles VRLA $\geq 250$ cycles	
Optional endurance in cycle test	9.6.2	Number of cycles = $34 \times RC_n - 581$	Optional
Water consumption Normal batteries (N)	9.7	No requirement	
Water consumption Low water loss batteries (L)	9.7	Maximum 16 g/Ah	
Water consumption Very low water loss batteries (VL)	9.7	Maximum 4 g/Ah	
Vibration	9.8	$U_{30s} \geq 7,2 \text{ V}$	
Electrolyte retention	9.9	No evidence of liquid on the vent plugs (or from the single point vent outlet)	
Cranking performance after activation	9.10	$U_{30s} \geq 7,2 \text{ V}$	
For both $C_e$ or $RC_e$ and the cranking performance, the specified values shall be met in at least one of the three relevant discharges above (see 9.1, 9.2, and 9.3).			