

L.N. 55 of 1980

MALTA BOARD OF STANDARDS ACT, 1965
(ACT NO. XXVII OF 1965)

Starter Batteries for Internal Combustion Engines Standard Order, 1980
(Standard Order No. 28:1980)

IN exercise of the powers conferred by section 4 of the Malta Board of Standards Act, 1965, the Malta Board of Standards has made the following standard order:—

Citation and
commencement.

1.1. This standard order may be cited as the Starter Batteries for Internal Combustion Engines Standard Order, 1980, and may be referred to as Standard Order No. 28:1980.

1.2. This standard order shall become operative on a date after the lapse of twenty days from the day in which it is laid on the Table of the House of Representatives, which date shall be notified by a notice in the Gazette.

Interpretation.

2.1. In this standard order, unless the context otherwise requires —

2.1.1. “the Act” means the Malta Board of Standards Act, 1965;

2.1.2. “active material” means that portion of a plate in which chemical changes are wrought by the passage of an electric current through a cell;

2.1.3. “battery” means two or more cells permanently connected together electrically in one container;

2.1.4. “capacity” means the quantity of electricity, usually expressed in ampere hours, which may be taken from a cell at a given rate of discharge under specified conditions of voltage and temperature;

2.1.5. “cell lid” means a component of acid resisting hard rubber composition, plastics or other insulating material which is sealed to the walls of the container near the top and is provided with holes for terminals and vent plugs;

2.1.6. “charging” means the passing of an electric current through the cell so as to bring it to a chemical condition in which it is capable of supplying electricity to an external circuit, which quantity of electricity thus put in is known as the charge and is usually measured in ampere hours;

2.1.7. “container” means a box made from acid resisting hard rubber composition, plastics or other insulating material in which the plates and other internal components of the cells are assembled;

2.1.8. “discharging” means the connection of a cell to an external circuit in such a way that energy flows from the cell into the external circuit, and the quantity of electricity thus taken out is known as the discharge, and is usually measured in ampere hours;

2.1.9. “dry charged battery” means a battery which may be

put into service and which will function satisfactorily without an initial charge after filling with electrolyte;

2.1.10. "element" means a unit comprising one positive group, one negative group and the necessary separators;

2.1.11. "end terminal post" means a lead alloy post which projects above the lid of the end cell of a battery and from which connection is made to the external circuit or to the end terminal post of another battery;

2.1.12. "lead-acid cell" means a cell fitted with plates in which the active materials are —

2.1.12.1. positive electrode; lead dioxide,

2.1.12.2. negative electrode: spongy lead, and

2.1.12.3. electrolyte: dilute sulphuric acid;

2.1.13. "plate" means a unit which, singly or in groups, is submerged in the electrolyte so that its surface forms the whole or part of one of the electrodes of the cell;

2.1.14. "plate group" means a complete electrode consisting of either positive or negative plates, burned to a common conductor (plate strap) and provided with a post from which connection may be made to another cell or to an external circuit;

2.1.15. "plate support" means a support or bottom rest upon which the plates rest; it may be either separated from, or integral with, the container;

2.1.16. "rated capacity or rating" means the ampere-hour capacity of a cell assigned to it by the maker under specified conditions of discharge specified at paragraph 6.1. of this standard order;

2.1.17. "secondary cell" means a voltaic cell which, after discharge, can be brought back to its initial charged chemical condition by passing a current through it in a reverse direction to that of discharge;

2.1.18. "separator" means a sheet of porous insulating material used in the separation of plates of opposite polarity;

2.1.19. "separator guard" means a component made from an acid resistant insulating material and so positioned as to prevent injury to the separators resulting from instruments inserted through the filling hole;

2.1.20. "vent plug" means a removal plug fitted to the lid arranged to give access for filling or topping up, and, while in position, to provide for the escape of gas from the cell and fitted with suitable baffles to arrest acid spray.

3.1. This standard order shall apply only to secondary lead-acid batteries which are primarily used for engine starting and other electrical loads in automobiles driven by internal combustion engines. **Scope.**

4.1. No licensee under the Act may use the standard mark in respect of any local starter battery which does not conform in every respect with the provisions of this standard order. **Use of standard mark.**

Design and
construction.

5.1. The battery shall be assembled in a monoblock container and each cell shall be fitted with a vent plug or, alternatively, the battery shall have a venting system whereby acid spray is arrested without impeding the free escape of gases, and each cell shall be sealed within the container so as to prevent any leakage of electrolyte.

5.2. The details of external design and construction of individual cells and complete batteries shall be left to the discretion of the manufacturer.

5.3. Battery sizes shall be as agreed between the vendor and the purchaser.

5.4. Battery terminals and layout shall be as agreed between the vendor and the purchaser.

5.5. The internal design of the battery shall be such as to fully comply with —

- 5.5.1. capacity tests;
- 5.5.2. high rate discharge tests;
- 5.5.3. retention of charge tests;
- 5.5.4. life cycling tests, and
- 5.5.5. overcharge life tests.

Rating.

6.1. The rating of a starter battery shall be assigned to it by the maker and shall be assessed in ampere hours obtainable at the 20-hour rate of discharge to a final voltage of 1.75 volts per cell when discharged under the conditions of tests as specified in sub-paragraph 11.1. of this standard order and with the electrolyte at an average temperature of 25° C.

Charging.

7.1. The normal charging rate in amperes during bench tests (unless otherwise specified) shall be numerically equal to 1/10 of the rated capacity at the 20-hour rate of discharge.

7.2. A battery shall be considered as fully charged when, with the normal charging current flowing, and with all cells gassing freely, its terminal voltage and the specific gravity of its electrolyte do not vary appreciably during two consecutive hours at the end of the charging period, account being taken of temperature variations.

Acid and
temperature
correction.

8.1. For the purposes of the tests specified in sub-paragraph 11.1. of this standard order, the specific gravity of the electrolyte in the cells, when fully charged, shall be between 1.280 and 1.290 (corrected to 15°C).

8.2. It is to be noted that the specific gravity given is for the purpose of testing to this standard and not necessarily the specific gravity of the electrolyte used when the battery is installed in a vehicle.

8.3. Effects of temperature on the specific gravity of the electrolyte as indicated by hydrometer shall be corrected as follows:

8.3.1. for each 10°C, above 15°C, add 0.007 to the observed reading, and

8.3.2. for each 10°C, below 15°C, deduct 0.007 from the observed reading.

8.4. The acid used for filling new cells shall be dilute sulphuric acid and shall comply with British Standard 3030 "Sulphuric acid for use in lead-acid batteries".

9.1. Batteries shall be deemed to comply with this standard order if they conform with the requirement that, when tested in accordance with the method referred to in sub-paragraph 11.1., the battery gives the rating on one of the three cycles. Physical requirements.
Rating.

9.2. When batteries are tested in accordance with the method referred to in sub-paragraph 11.1., the voltage, measured at the battery terminals between five and seven seconds after commencement of discharge, shall average not less than 1.67 volts per cell, and the duration of the discharge to the final voltage (i.e. 1.33 volts per cell) shall be not less than 5 mins. 50 secs.

9.3. When batteries are tested in accordance with the method referred to in sub-paragraph 11.1., the voltage, measured at the battery terminals between five and seven seconds after commencement of discharge, shall average not less than 1.33 volts per cell, and the duration of the discharge to the final discharge (i.e. 1.00 volts per cell) shall be not less than 3 minutes.

9.4. When batteries are tested in accordance with the method referred to in sub-paragraph 11.1., the capacity obtained on the third test shall be not less than the capacity rating, while the capacity given by the second test shall be not less than 75% of the average capacity of the first and third tests.

9.5. When batteries are tested in accordance with the method referred to in sub-paragraph 11.1., after the 225th cycle the capacity obtained shall not be less than 0.7 times the capacity rating.

9.6. When batteries are tested in accordance with the method referred to in sub-paragraph 11.1., on each of the six high-rate checking discharges, the minimum voltage of 1.33 volts per cell shall not be reached in a time shorter than 4 minutes.

9.7. When batteries are tested in accordance with the method referred to in sub-paragraph 11.2., there shall be no sign of cracks or other flaws in the filled batteries.

10.1. Each battery shall have a legible and durable marking giving — Marking of
batteries.

10.1.1. the nominal voltage;

10.1.2. the rated capacity, and

10.1.3. the standard mark and the inscription "Complies with the Malta Board of Standards Order No. 28 of 1980."

11.1. The tests for rating, high rate of discharge at normal temperature, high rate of discharge at low temperature, retention of charge, life cycling and overcharge life shall be carried out as described in clause 7 of British Standard No. 3911. Methods
of test.

11.2. Neon lamp test (crack):

11.2.1. Apparatus:

- (a) a neon lamp, and
- (b) a suitable insulated probe.

11.2.2. Connect one pole of the battery to the neon lamp and connect the lamp to one of the terminals of an alternating current supply having a voltage between 200 and 250 volts (r.m.s.) and a frequency of between 25 and 100 c/s. Connect the other terminal of the supply to the insulated probe. Test the whole surface of the battery by drawing the probe across it. The presence of a crack will cause the lamp to light.