

SPECIFICATION
FOR
BATTERY, SECONDARY - PORTABLE, LEAD-ACID TYPE
12V, 9Ah (FILLED UNCHARGED) 6, MK 1
NATO STOCK No 6140-99-111-5237

1. GENERAL

This Supplement is to be read in conjunction with the general specification for batteries, secondary, portable, lead-acid type contained in DEF STAN 61-9 (PART 1).

2. CONSTRUCTION

a. The construction of the battery is to be in accordance with the requirements of Drawing No FV 546179 (latest issue) obtainable from the Procurement Executive, Ministry of Defence, Military Vehicles and Engineering Establishment, Chobham Lane, Chertsey, Surrey KT16 0EE.

b. This battery is constructed on the supported plate principle with the electrolyte absorbed, specific gravity readings can therefore not be taken.

3. MASS

The mass of the battery when filled with electrolyte to the level of the perforated separator protector in the fully charged state shall not exceed 4 kg.

4. QUALIFICATION APPROVAL TESTING

Eight batteries are to be provided, two each being required for sub-groups I, II, III and IV of the group C tests specified in clause 6 of this supplement.

5. PREPARATION FOR TESTING, AND RECHARGING

The batteries shall be prepared for test in accordance with the First Charge Instructions attached to each battery. All recharging unless otherwise specified in the particular test requirement shall be in accordance with clause 21c of the general specification except that charging shall be carried out at 1.25 amperes for 10 hours.

6. APPLICABLE TESTS

a. Qualification Approval and production inspection group A tests.

Tests to be applied to each battery:

TEST	GENERAL SPECIFICATION CLAUSE
Polarity of plates	20a
Plate separation	20b
Sealing	20c

b. Production inspection group B tests.

Random samples shall be taken from each production batch at a rate in accordance with clause 15b of the general specification, and subjected to the following tests:

TESTS IN ORDER OF APPLICATION	SPECIFICATION CLAUSE	
	GENERAL	SUPPLEMENT
Mass	21e	3
Capacity discharge 5-hour rate	21j(3)	9 and 10
Capacity discharge 10-hour rate at -40°C	21j(8)	9

c. Qualification Approval and production inspection group C tests.

At intervals of 2000 batteries produced or 18 months, whichever occurs first, eight batteries shall be subjected to the full range of Qualification Approval tests (see clause 4),

TESTS IN ORDER OF APPLICATION	SPECIFICATION CLAUSE		SUB-GROUP
	GENERAL	SUPPLEMENT	
Two year storage	21q	-	- - - IV
Vibration test A	21p(1)	7	- II III -
Tropical test	21o	7	- II - IV
Sealing	20c	-	- II - IV
Mass	21e	3	I II III IV
Capacity discharge 20-hour rate	21j(1)	9	I - - IV
Capacity discharge 5-hour rate	21j(3)	9 and 10	- II III -
Electrolyte retention test D	21f	8	I II III IV
Capacity discharge 10-hour rate at -40°C	21j(8)	9	I II III IV
Capacity discharge 5-hour rate	21j (3)	9	I II III IV
Charge retention	-	11	I II III IV
Capacity discharge 1-hour rate	21j(4)	9	I II III IV
Capacity discharge 30-minute rate	21j(5)	9	I II III IV
Thermal shock test	-	12	- - III -
Vibration test B	21p(2)	13	- - III -
Life test A	21m	14	I II - IV

6. c. (Contd)

Note: Tests on sub-groups I, II and III are to commence within 60 days from the date of manufacture of the sample batteries.

7. VIBRATION TEST A (general specification, clause 21p(1))

TROPICAL TEST (general specification, clause 21o)

Batteries are delivered filled but uncharged. Vibration test A and the Tropical test shall be carried out on batteries with their tapes and tie-on labels attached as delivered.

8. ELECTROLYTE RETENTION (general specification, clause 21f)

Test D is to be applied with the battery on open circuit.

9. CAPACITY RATINGS

For the purpose of the specified tests the following ratings shall apply:

20-hour rate	- 9 ampere hours
10-hour rate	- 8 ampere hours
5-hour rate	- 7 ampere hours
1-hour rate	- 5.5 ampere hours
30-minute rate	- 4.5 ampere hours.

10. CAPACITY DISCHARGE TEST 5-HOUR RATE AT 25°C (general specification, clause 21j(3))

Three cycles of discharge/charge are to be applied. The duration of discharge is to be not less than 4.5 hours for the first and second discharges and not less than 5 hours for the third discharge.

11. CHARGE RETENTION TEST

The battery shall be tested for charge retention in accordance with the procedure specified in clause 21k(1) (Test A) of the general specification except that it shall be charged as stated in clause 5 of this Supplement, and the discharge shall be at the 5-hour rate. The duration of discharge is to be not less than 4.5 hours.

12. THERMAL SHOCK TEST

a. The battery shall be charged in accordance with clause 5 of this Supplement and then tested for efficiency of sealing in accordance with clause 20c of the general specification.

b. The battery shall then be placed in a cold chamber at an ambient temperature of minus $40 \pm 2^\circ\text{C}$ for 24 hours.

c. Without delay the battery shall be removed from the cold chamber and placed in a hot chamber at an ambient temperature of $65 \pm 2^\circ\text{C}$ for 24 hours.

d. The battery shall then be removed from the hot chamber, allowed to cool to $25 \pm 2^\circ\text{C}$ and tested for efficiency of sealing as in sub-clause 12a.

12. e. The battery shall be brought back to the fully charged condition topping up with distilled water if necessary.
- f. Test procedures stated in sub-clauses 12b to 12e inclusive of this Supplement shall be repeated.
- g. The battery shall then be subjected to a 5-hour rate capacity discharge test in accordance with clause 21j(3) of the general specification. The specified requirements shall be met in full.
- h. During and on completion of the above tests, the efficiency of sealing shall be unimpaired and the battery shall show no evidence of other damage.

13. VIBRATION TEST B (general specification, clause 21p(2))

The discharge called for at paragraph 21p(2) of the general specification shall be at the 10-hour rate.

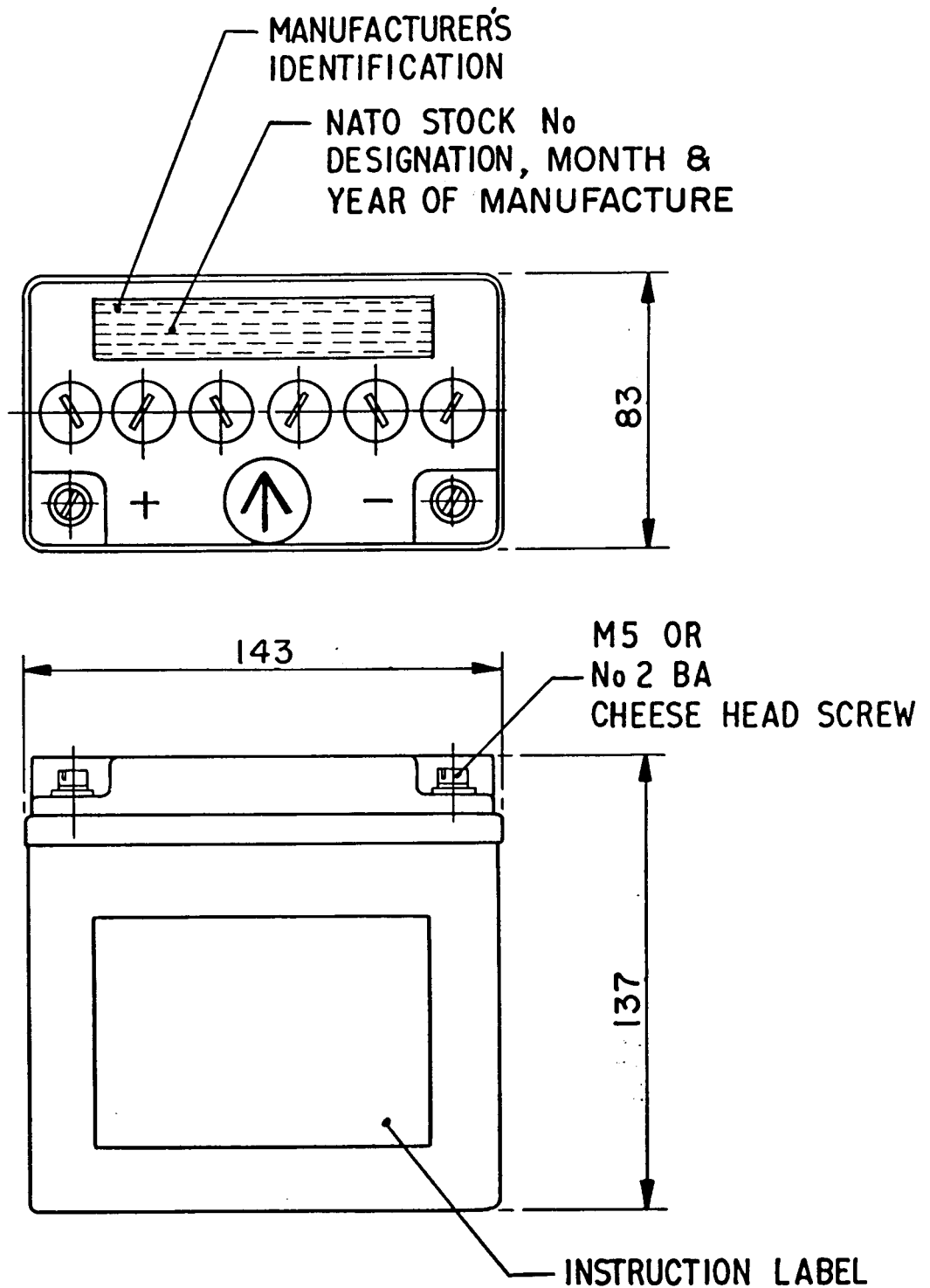
14. LIFE TEST A (general specification, clause 21m.)

a. The charge retention tests during life testing (general specification clause 21m(12)) shall be carried out at the 32nd and 100th discharges. The test conditions shall be in accordance with clause 21m(12) parts (a) and (b) except that the discharges called for at sub-clauses 21m(12)(a)(iii) and 21m(12)(b)(iii) shall be at one fifth of the 5-hour rate capacity instead of one twentieth of the 20-hour rate capacity and the duration of discharge shall be not less than 3.75 hours and 3.25 hours respectively.

b. Minimum life.

The number of life test cycles (general specification, clause 21m(13)) shall be not less than 100.

NATO STOCK No 6140-99-III-5237



NOTES

1 DIMENSIONS ARE IN mm

2 FOR FURTHER DETAILS SEE DRAWING No FV 546179

THIRD ANGLE PROJECTION



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Removal of Product Qualification Approval

IMPORTANT ANNOUNCEMENT

1. This Standard contains a Product Qualification Approval (PQA) scheme. ⁱMOD policy requires that all PQA schemes are removed from Defence Standards called up in contracts placed after 1st January 1998.
2. Users of this Standard are to contact the Project Manager (PM), Equipment Support Manager (ESM) or Technical Service Authority (TSA) named in the contract or order, to identify whether there is a continuing need for an approvals scheme.
3. ⁱⁱProduct Conformity Certification (PCC) is a risk based process that replaces PQA. Once a risk has been identified PCC can be included as a contract clause. In exceptional circumstances agreement can be sought from AD/Stan for PCC to be included in a Defence Standard.
4. At the next revision of this Standard the PQA scheme will be removed.

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ⁱ Defence Council Instruction (General) 197/97; Quality Temporary Memorandum 5/98; Chief of Defence Procurement Instruction CDPI/TECH/250 (draft)

ⁱⁱ PCC is certification that a product meets its specification. When PC is required by the contract, the contractor is responsible for obtaining the necessary PCC. Certification shall be provided from a NAMAS accredited laboratory when appropriate. PCC shall apply where a Risk Assessment has been identified by the PM; ESM or TSA.