INCH-POUND

MIL-B-49430C(ER)
AMENDMENT 3
28 July 1993
SUPERSEDING
AMENDMENT 2
22 April 1992

MILITARY SPECIFICATION

BATTERIES, NON-RECHARGEABLE, LITHIUM SULFUR DIOXIDE

This amendment forms a part of MIL-B-49430C(ER), dated 1 August 1991, and is approved for use by the Army Research Laboratory, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

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* Paragraph 2.1.1, STANDARDS, MILITARY - Delete MIL-STD-970.

* Paragraph 2.1.1, STANDARDS, MILITARY - Add "MIL-STD-199 - Resistors, Selection and Use of".

* Paragraph 3.2 - Delete in its entirety.

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* Paragraph 3.4.2 - Add the following sentence: "The contractor shall assure proper insulating compound curing for each battery lot."

Paragraph 3.5.1, first line - Delete the first sentence and replace with:

"Intercell connections shall be spot welded in accordance with the contractor's established procedures. These procedures shall be developed by the contractor as part of the quality program requirements of the contract and shall use MIL-W-8939 as guidance."

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* Paragraph 3.5.5.2 - Modify as follows:

Delete:	Replace with:
"I_F = 3 amperes	"I_F = 3 amperes minimum
V_F = 0.65 volts maximum	V_F = 0.65 volts maximum
I_R = 2 milliamperes	I_R = 2 milliamperes maximum
V_R = 40 volts"	V_R = 40 volts minimum"

Paragraph 3.5.5.3, line 19 - Delete "shall conform to requirement 33 of MIL-STD-454" and substitute "shall be selected in accordance with MIL-STD-199, and shall conform to the appropriate specification identified by MIL-STD-199."

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Paragraph 3.5.6 - delete in its entirety and substitute:

"3.5.6 Jackets. (See 4.8.11) The jackets shall be non-metallic material. The contents of multicell batteries shall fit snugly enough in the jackets to minimize movement of the cells. Jackets covering one or more cylindrical cells stacked end on end, and having open top and open bottom, shall be so attached to the cells as to prevent them from slipping out. Non-metallic jackets enclosing a battery shall not support combustion after being subjected to flame. The seams of the jacket shall not be open prior to or after being subjected to any test to which the battery is subjected (see 4.8)."

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* Paragraph 3.11 - Add the following: "Defect categories 104 and 202 of Table IV shall not apply to batteries that have been subjected to the drop test. Batteries shall be subjected to and pass the dimension test of paragraph 4.8.4.1 following the test."

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* Paragraph 3.14.4 - Delete the description of the complete discharge device card contents and replace with the following"

"ATTENTION

THIS BATTERY HAS A DISCHARGE SWITCH IN ORDER TO MAKE IT NONREACTIVE. AFTER FINAL USE, REMOVE ATTENTION LABEL COVERING THE SWITCH, PUSH SWITCH, AND STORE FOR FIVE DAYS IN A WELL VENTILATED ROOM. THE BATTERIES SHOULD HAVE A MINIMUM OF TWO INCHES BETWEEN THEM DURING DISCHARGE. IF A FRESH BATTERY FAILS TO OPERATE A USING EQUIPMENT, THE COMPLETE DISCHARGE DEVICE SHOULD NOT BE OPERATED AND THE BATTERY MUST BE DISPOSED OF AS HAZARDOUS WASTE. COORDINATE DISPOSAL WITH YOUR LOCAL ENVIRONMENTAL OFFICE/OFFICER. STATE/LOCAL REGULATIONS WILL CONTROL DISPOSAL IN YOUR AREA."

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* Paragraph 4.1.2.1.4 - Delete in its entirety and substitute:

"4.1.2.1.4 Timing. Timing equipment shall be accurate within 0.1 percent unless the measured time is equal to or less than 120 seconds, where the timing accuracy shall be 0.5 percent or better."

passivate in accordance with QQ-P-35.

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* Table II - Delete in its entirety and substitute:

TABLE II - In process inspection.

Inspection	Requirement Paragraph	Test Method Paragraph	Cell	Battery Component	Sampling Plan
Cell, closed circuit voltage	3.6.3	4.8.12	X		100 percent of cell lot
Sulfur dioxide gas leakage	3.8	4.8.13	X		4.5.2.1
Cell discharge	3.8.1	4.8.13.1	X		4.8.13.1
Stoichio-metric mole ratio	3.13	4.8.17	X		Certification only
Cell water content	3.15	4.8.19	X		Certification only
Insulating compounds flow and shrinking	3.4.2	4.8.14		X	Once per battery lot (see 6.4.4)
Intercell connections	3.5.1	4.8.18		X	4.8.18.1
High temper-ature switch	3.5.5	4.8.16		X	4.8.16.1
Cell series string voltage	3.6.4	4.8.12.1		X	100 percent of cell strings
Complete discharge device	3.5.5.3	4.8.20		X	100 percent of resistors

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* Table III, Group I, move "Drop test" to immediately after the "Insulation resistance of terminals" test.

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Paragraph 4.7, delete title of paragraph and replace with:

"4.7 Quality conformance inspection."

* Paragraph 4.7.1.1 - Delete in its entirety and substitute:

"4.7.1.1 Group A inspection. Each battery on contract or purchase order shall be 100 percent inspected for conformance to the inspections specified in Table IV. Recording of absolute measurements of electrical parameters is required only for failures. The diode test may be run after the battery is fully wired prior to final battery assembly at the contractor's option. Prior to production, the contractor shall notify the Government Quality Assurance Representative of the point in the production process where diode testing will occur."

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Table VII - Delete in its entirety and substitute:

Table VII - Group C Inspection.

Inspection Lot Size	Sample Size	Acceptance No. 4.7.1.3.2 a,b,c	Acceptance No. 4.7.1.3.2 d
500 or less	13	1	0
501-1,200	20	2	0
1,201-10,000	32	3	0
10,001-35,000	50	5	0
35,001 or more	80	7	0

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Table VIII, delete in its entirety and substitute:

TABLE VIII - Group D inspection.

Storage and Capacity Test	Requirement Paragraph	Method of Test Paragraph
Subgroup I (see 4.7.1.4.3.1) Capacity T & TP (where applicable)	3.7	4.8.9.1.7
Subgroup II (see 4.7.1.4.3.2) Capacity D	3.7	4.8.9.1.8

Paragraph 4.7.1.4.1, delete in its entirety and substitute:

"4.7.1.4.1 Sampling Plan. A sample of n_s batteries shall be selected at random from production for each shipment lot in amounts determined from the following formula, and rounded off in the case of fractions to an adjacent integer (up or down for each shipment lot), so that exactly n batteries have been assigned to both T combined with TP (where applicable) capacity test when the sample for the final shipment of the contract lot has been drawn.

$$n_s = a + N_s \frac{n}{N}$$

where:
a = five batteries for D capacity test
n_s = total number of sample batteries to be taken from each shipment lot
N_s = number of batteries in the shipment lot
N = number of batteries in the contract lot (see Table IX)
n = number of batteries to be taken from the contract lot for each of the two capacity tests, T combined with TP (where applicable) in accordance with Table IX (total number of T selected is n)."

Paragraph 4.7.1.4.1.1, delete in its entirety and substitute:

"4.7.1.4.1.1 Allocation of sample batteries for Group D inspection. The number of batteries n_s selected from a shipment lot shall be assigned at random at the Government test facility so that five batteries shall be scheduled for the D capacity test and the remainder for the T and TP (where applicable) test. Such assignment shall result in the allocation of exactly n batteries to both T combined with TP (where applicable) capacity tests after the final shipment on the contract lot is made. If necessary, the sample size n_s taken from the last shipment lot of a contract lot shall be adjusted so that this result is achieved."

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Table IX, delete in its entirety and substitute:

TABLE IX - Sample size and allowable failures for T capacity test. 1/

Contract lot Size "N"	Sample size "n" for T tests 1/ from contract lot	Acceptance No. for T tests 2/
0 to 110	5 3/	-- 3/
111 to 500	15	3
501 to 800	25	5
801 to 1,300	35	7
1,301 to 3,200	50	9
3,201 to 8,000	75	13
8,001 to 22,000	110	18
22,001 to 110,000	150	24
over 110,000	225	34

1/ Test is combined with TP (where applicable).

2/ When the number of capacity values falling below the minimum requirements specified (see 3.1) for a given test is equal to or less than the associated acceptance number, the contract lot from which the sample was drawn has met the requirements of that test.

3/ Determination of compliance specified in 4.7.1.4.2 shall not apply to contract lot sizes of less than 111."

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* Paragraph 4.8.10.1, third line - Add the following: "(see 3.5.7.1)".

* Paragraph 4.8.10.3, line 10 - Delete "This test shall be conducted immediately following the battery closed circuit voltage test."

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* Paragraph 4.8.14 - Add the following: "This test shall be performed where required either during First-article inspection or during Quality conformance inspection for the first battery lot."

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Paragraph 4.8.16.1 - Delete in its entirety and substitute:

"4.8.16.1 Sample Size. Sample size shall be twenty each for each shipment lot. No failures allowed."

Paragraph 4.8.16.2 - Delete in its entirety.

Paragraph 4.8.18.1 - Delete in its entirety and substitute:

"4.8.18.1 Sample Size. Sample size shall be twenty each for each shipment lot. No failures allowed."

* Paragraph 4.8.20 - Delete in its entirety and substitute:

"4.8.20 Complete discharge device resistor. Each battery shall have the value of the resistor to be used in the complete discharge device verified. Verification of the resistor shall be done either with an ohmmeter of proper range and sensitivity or by applying a measured voltage and reading the resultant current. Verification of resistance values may be done prior to final battery assembly at the contractor's option. Discrete measurement recording is required only for failures. Prior to production, the contractor shall notify the Government Quality Assurance Representative where in the production process the resistance values will be verified."

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Paragraph 6.4.1 - Delete in its entirety.

The margins of this amendment are marked with an asterisk to indicate where changes (additions, modifications, corrections deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

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