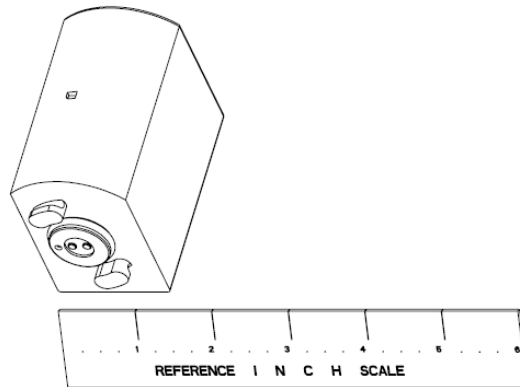


INCH-POUND
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30 October 2008

PERFORMANCE SPECIFICATION SHEET
BATTERY, NON-RECHARGEABLE, LITHIUM

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the product herein shall consist of this specification sheet and MIL-PRF-32271.



See NOTES for nominal dimensions; see applicable drawing for dimensional requirements.

FIGURE 1 – General view, M32271/10 battery shape

REFERENCES

NAVAIR 1794AS053 Performance Specification for Batteries, Non-Rechargeable, High Performance (LIMNO2)

(Copies of this document are available from Naval Air Systems Command, Patuxent River, MD 20670-1547)

REQUIREMENTS (see 1.2 for Type, Class, and Features descriptions):

Type – I
Class – 2
Features – D
PIN – M32271/10-12D
Approved chemistry:
Lithium manganese dioxide (Li/MnO₂)

Specification requirements: The following requirements of MIL-PRF-32271, identified therein by the phrase “when specified”, are applicable as indicated below:

<u>Requirement</u>	<u>Specification Reference</u>	<u>Applicability</u>
Parallel cell arrangements ¹	3.4	Yes
Connectors ²	3.4.5	Yes
Battery charger connection	3.4.5.1	No
Connection integrity	3.4.5.2	Yes
Terminal integrity	3.4.6	No
Complete discharge device	3.4.7	Yes
State of charge device	3.4.8	Yes
State of charge data output	3.4.8e	No
Cell charging	3.5.3	Yes
Nail penetration	3.5.4	Yes
Cell series string short circuit	3.5.6	Yes
Parallel string charge protection ³	3.5.6.1	Yes
Charge protection	3.5.11	Yes
Over-current protection	3.5.13.1	Yes
Over-temperature protection	3.5.14	Yes
Surface temperature	3.6h	Yes
Capacity tests LR and LRT		No
Immersion	3.7.8	No
Watertight integrity	3.7.9	Yes
DO NOT CHARGE! marking	3.8.1.2b	No
Complete discharge device marking/label	3.8.4	Yes
State of charge marking	3.8.5	Yes

Dimensions, marking and configuration

- Battery – Drawing A3315887
- Battery Connector (3.4.5 & 4.6.1.7) – Drawing A3315887
- Mating Connector – General Dynamics P/N 01-P49797J001
- Battery Charger Connector – Not Applicable

Battery voltages (3.4.4 & 4.6.1.5):

Battery open-circuit voltage (3.4.4.1 & 4.6.1.5.1):

Maximum – 13.2 volts

Minimum – 12.0 volts

Battery closed circuit voltage (3.4.4.2 & 4.6.1.5.2):

For capacity and initial voltage delay: 7.0 volts for H2, L & LT tests; 7.5 volts for all other capacity tests.

For battery closed circuit voltage test Minimum – 8.0 volts

Cell closed circuit voltage test (3.4.4.3 & 4.6.1.3): Minimum - 2.0 volts per cell

¹ Parallel cell arrangements are permitted but are not required

² For continuity only

³ Only required if parallel cell arrangements are used

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Maximum weight (3.1 & 4.6.1.6): – 0.6 lbs. (272 g)

Connection integrity, static and dynamic (3.4.5.2; 4.6.1.7.2; & 4.6.1.7.3): When subjected to the static or dynamic connection integrity tests, battery voltage shall remain above 12 volts and shall meet the requirements of 3.4.5.2.

Capacity test requirements (3.6 & 4.6.4):

Test	Initial voltage delay		Minimum Capacity	Cut-off Volts	
	Time (MAX) to	Volts			
I	1 second	7.5	15.0 hours		7.5
L	1 second	7.0	1.5 hours		7.0
H	1 second	7.5	17.0 hours		7.5
H2	1 second	7.0	6.5 hours		7.0
Storage Period					
			<u>1-Week</u>	<u>4-Week</u>	
IT	1 second	7.5	13.9 hours	13.5 hours	7.5
LT	1 second	7.0	1.4 hours	1.3 hours	7.0
HT	1 second	7.5	15.8 hours	15.3 hours	7.5

Abuse test minimum capacity requirement (3.5.12 & 4.6.2.12i): 3.0 ampere-hours.

Dust Cap. Each battery as delivered shall be provided with a dust cap that covers the battery terminals. The cap shall be snug-fitting and shall be removable by hand at temperatures from –40 to 130°F. The material used for the dust cap shall be non-toxic and non-flammable, shall withstand temperatures from –40 to 195°F without shrinkage or cracking, and shall not affect the performance of the o-ring in providing a watertight seal against the radio. The dust cap shall not leave any residue on the battery contacts nor have any adverse affect on the battery/radio interface. The dust cap should either be black or closely match the color of the battery. Compliance to these requirements shall be certified (3.2.1).

Magnet. Each battery shall include a magnet conforming to the magnet requirements of NAVAIR 1794AS0953, to be used to identify its rate capability to HOOK-112 radios. See “VARIANCES” herein for requirements and test methods.

METHODS OF EXAMINATION AND TEST:

Verification requirements. The following verification requirements of MIL-PRF-32271, identified therein by the phrase “when specified,” are applicable as indicated below:

Test Requirement	Specification Reference	Applicability
Parallel discharges	Tables III, IV, IX, & XI	No
Connector ⁴	4.6.1.7	Yes
Battery charger connection test	4.6.1.7.1	No
Static connection integrity	4.6.1.7.2	Yes
Dynamic connection integrity	4.6.1.7.3	Yes
Terminal integrity	4.6.1.8	No

Continued next page

⁴ Verification for continuity only; insertion and withdrawal measurements not required for this battery

<u>Test Requirement</u>	<u>Specification Reference</u>	<u>Applicability</u>
Complete discharge device	4.6.1.9	Yes
State of charge device	4.6.1.10	Yes
Cell charging	4.6.2.3	Yes
Nail penetration	4.6.2.4	Yes
Cell series string short	4.6.2.6	Yes
Parallel cell charge protection ⁵	4.6.2.6.1	Yes
Charge protection test	4.6.2.11	Yes
Battery over-current protection	4.6.2.13	Yes
Battery over-temperature protection	4.6.2.14	Yes
Surface temperature	4.6.4.1	Yes
Capacity test LR	4.6.4.1.5	No
Capacity test LRT	4.6.4.1.9	No
Immersion	4.6.5.8	No
Watertight integrity	4.6.5.9	Yes

Cell closed-circuit voltage test: When cells are tested as specified in 4.6.1.3, load each cell to be used in a single series cell string design with 1 ampere constant current, 2 ohms constant resistance, or 2 watts constant power. In the event that parallel cell arrangements are used, use a load that produces a current equivalent to 1 ampere divided by the number of parallel cell strings to be used, as a minimum.

Battery closed-circuit voltage test: When tested as specified in 4.6.1.5.2, load the battery with 1 ampere constant current, 8 ohms constant resistance, or 8 watts constant power.

Dimensions (4.6.1.6). Reference Drawing A3315887. Dimension D6 shall be measured in not less than two places: at the top (terminal end) and bottom of the battery. The same tolerance shall apply in both locations.

Static connection integrity (4.6.1.7.2): Connect batteries subjected to this test to test fixture, General Dynamics P/N 01-P49797J001. Center applied weight at a location 2.00 ± 0.125 inches from the terminal end of the battery.

Dynamic connection integrity (4.6.1.7.3). Connect batteries subjected to this test to test fixture, General Dynamics P/N 01-P49797J001.

Abuse test, pre-discharge: When tested as specified in 4.6.2.12a, discharge with a load of either 1 ampere or 12 watts for 1.6 hours.

Abuse test, pulse discharge: When tested as specified in 4.6.2.12i, discharge with a load of 1.25 amperes for 1 minute followed by 1.1 amperes for 4 minutes, cycled continuously to 7.5 volts.

Battery over-current protection: When tested as specified in 4.6.2.13, load batteries with either 3.75 amperes or 45 watts.

⁵ This test only required if parallel cell arrangements are used

Capacity tests (4.6.4):

Test	Discharge Rate	Duty Cycle
I	See Below	Continuous discharge to cut-off volts, followed by 650 milli-amperes to zero volts, then 650 milli-amperes forced discharge for 5 minutes
L	See Below	Continuous discharge to cut-off voltage
H	See Below	Continuous discharge to cut-off voltage
H2	See Below	Continuous discharge to cut-off voltage
IT	See Below	Continuous discharge to cut-off voltage
LT	See Below	Continuous discharge to cut-off voltage
HT	See Below	Continuous discharge to cut-off voltage

Discharge Rate for all capacity tests except H2 (4.6.4): Discharge continuously at 1.8W for 267 seconds, followed by 7.2W for 30 seconds, followed by 26W for 3 seconds, to cut-off volts.

Discharge Rate for H2 capacity test (4.6.5.9e): Discharge continuously at 8.5 watts for 2.1 seconds followed by 3.0 watts for 18.9 seconds to cut-off volts.

Watertight integrity (4.6.5.9): Connect batteries subjected to this test to a connector consisting of General Dynamics P/Ns 64-P21451J001 (coupler plate, 1 each), 84-P21427J001 (PWB, 1 each), and 39-P21428J001 (contact, 2 each), whenever connection to a test fixture is required by 4.6.5.9. When assembled, insure that this fixture forms an air-tight seal against the battery. Parts and materials in addition to those specified are permissible in order to obtain the air-tight seal provided they do not extend below the contact surface of the battery.

VARIANCES: Each battery shall comply with MIL-PRF-32271 except as follows:

Add the following paragraphs:

3.4.11 Magnet. Each battery shall include a magnet conforming to 3.1.1, 3.1.8, and Figure 2 of NAVAIR 1794AS0953 for purposes of identifying its rate capability to HOOK-112 radios. When tested as specified in 4.6.1.11, the magnet shall have not less than 15 ampere-turns of magnetomotive force.

4.6.1.11 Magnet test. Each battery shall be tested for magnetomotive force within the volume specified by Figure 2 of NAVAIR 1794AS0953.

Modify tables as follows:

TABLE III – Group III Battery Inspections and Tests. Add the following after “Connector”

Group No.	Sample Size	Inspection	Requirement Paragraph	Test Method Paragraph
III	23	Magnet test	3.4.11	4.6.1.11

Table IX – Group B Inspections and Tests. Add the following after “Charge protection”

Inspection or Test	Requirement Paragraph	Method or Test Paragraph	Test sample break-out by test
Magnet test <u>1</u> /	3.4.11	4.6.1.11	All

NOTES:

(This section contains information of a general nature which may be helpful, but is not mandatory)

Intended use: This battery is intended to operate the family of AN/PRC-112 survival radios as well as their companion program loaders. It can also be used to power a training device for Wide Area Munitions.

⁶Nominal ratings: The following are the nominal ratings for each battery type described by this specification sheet. They are provided for information purposes.

Battery PIN:	M32271/10-12D (Li/MnO₂)
<i>Overall Dimensions:</i>	3.31 in H x 2.25 in W x 1.54 in D
<i>MAX Weight:</i>	0.6 lbs (272 grams)
<i>Voltage Range:</i>	7.5 – 13.20
<i>Nominal Capacity: (in ampere-hours)</i>	3.25 Amp-hrs
<i>Nominal Energy: (in watt-hours)</i>	39 Watt-hrs
<i>MAX rated power output:</i>	26 watts (3s pulse)
<i>MAX continuous load rating:</i>	1.0 ampere
<i>MAX pulse load rating:</i>	3.5 amperes
<i>Instantaneous trip rating:</i>	4.0 amperes
<i>Operating temperature range:</i>	-40 to 130°F (-40 to 55°C)
<i>Storage temperature range:</i>	-40 to 160°F (-40 to 71°C)
<i>MAX abusive temperature: (non-operating)</i>	195°F (91°C)

Other data:

Military Type Designations. The military type designation that relates to the PIN covered by this specification sheet is as follows: The BA-5312()/U designation has been used for the Type I PIN. It should be noted that the Type II BA-5112()/U has been replaced by the BA-5312()/U.

This battery is subject to the transportation requirements of 49 CFR 173.185. The battery has solid cathodes and more than 2.0 grams of lithium content. See applicable Material Safety Data Sheet (MSDS) for the maximum lithium weight per cell and battery. It should be noted that all non-rechargeable lithium batteries are restricted from shipment as cargo aboard passenger aircraft within, entering, or leaving the US.

⁶ Capacity and energy delivered by a battery are significantly affected by usage conditions, such as temperature and loads applied. If you have any questions about use of this battery in a particular device or circumstance, please visit the following web site (contact info is posted): <http://www.cerdec.army.mil/c2d/armypower>.

This battery includes a complete discharge device in order to render the battery as non-reactive after use. If the battery is damaged, or if the device does not operate as indicated by an amber or yellow light, the battery is considered reactive waste. This battery may be recycled after use. Universal waste rules, where applicable, apply only when recycling is the chosen disposal method.

Navy safety tests of NAVSEA S9310-AQ-SAF-010 are required for this battery during first article testing. The test data provided from the testing will be used to evaluate applications for specific using devices and Navy platforms. Devices using this battery will require US Navy Safety Approval prior to use by Department of Navy users unless such approval has already been granted. Please consult with NAVSEA Instruction 9310.1 for further information.

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue 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 issue.

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Army – CR
Navy – SH
Air Force – 99
DLA – CC

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Review activities:

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