

INCH-POUND MIL-PRF-32271/4 30 October 2008
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# 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 and MIL-PRF-32271.

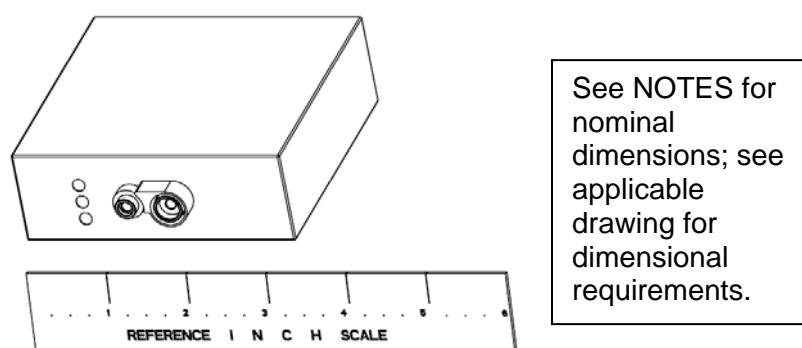


Figure 1 – General View, M32271/4 Battery Shape

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

<i>Type:</i>	I		II		III
<i>Class:</i>	2		2		2
<i>Features:</i>	C	E	C	E	E
<i>PIN:</i>	M32271/4-12C	M32271/4-12E	M32271/4-22C	M32271/4-22E	M32271/4-32E
<i>Approved Chemistry:</i>	Lithium Manganese Dioxide		Lithium Sulfur Dioxide		Lithium Manganese Dioxide

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

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Requirement	Specification Reference	Applicability by PIN Suffix (M32271/4-)				
		12C	12E	22C	22E	32E
Parallel cell arrangements <sup>1</sup>	3.4	Yes	Yes	No	No	Yes
Connectors	3.4.5	Yes	Yes	Yes	Yes	Yes
Battery charger connection	3.4.5.1	Yes	Yes	Yes	Yes	Yes
Connection integrity	3.4.5.2	No	No	No	No	No
Terminal integrity	3.4.6	No	No	No	No	No
Complete discharge device	3.4.7	Yes	Yes	Yes	Yes	Yes
State of charge device	3.4.8	No	Yes	No	Yes	Yes
State of charge data output	3.4.8e	No	Yes	No	Yes	Yes
Cell charging	3.5.3	Yes	Yes	Yes	Yes	Yes
Nail penetration	3.5.4	Yes	Yes	No	No	Yes
Cell series short circuit	3.5.6	Yes	Yes	No	No	Yes
Parallel string charge protection <sup>2</sup>	3.5.6.1	Yes	Yes	No	No	Yes
Charge protection	3.5.11	Yes	Yes	Yes	Yes	Yes
Over-current protection	3.5.13.1	Yes	Yes	Yes	Yes	Yes
Over-temperature protection	3.5.14	Yes	Yes	Yes	Yes	Yes
Surface temperature	3.6h	Yes	Yes	Yes	Yes	Yes
Capacity LR & LRT		No	No	Yes	Yes	No
Immersion	3.7.8	Yes	Yes	Yes	Yes	Yes
Watertight integrity	3.7.9	No	No	No	No	No
DO NOT CHARGE! marking	3.8.1.2b	Yes	Yes	Yes	Yes	Yes
Complete discharge device marking/label	3.8.4	Yes	Yes	Yes	Yes	Yes
State of charge marking	3.8.5	No	Yes	No	Yes	Yes

Dimensions, marking and configuration, all types:

Battery - Drawing A3315881

Battery Connector (3.4.5 & 4.6.1.7) – Drawing A3315881

Mating Connector (3.4.5 & 4.6.1.7) – Drawing A3315881

Battery Charger Connector (3.4.5.1 & 4.6.1.7.1) – Part Number J-6357()/P or equal

Battery voltages, all types (3.4.4 & 4.6.1.5):

Battery open-circuit voltage (3.4.4.1 & 4.6.1.5.1):

Type:	Types I & III	Type II
Maximum:	16.5 volts	15.25 volts
Minimum:	14.9 volts	14.40 volts

Battery closed circuit voltage, all types (3.4.4.2 & 4.6.1.5.2):

For capacity, initial voltage delay, and closed circuit voltage test:

Minimum – 11.0 volts

<sup>1</sup> Parallel cell arrangements are permitted for Types I and III batteries described by this specification sheet but are not required.

<sup>2</sup> Only required if parallel cell arrangements are used for Type I or III batteries

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Cell closed circuit voltage test (3.4.4.3 & 4.6.1.3): Minimum - 2.2 volts per cell

Maximum weight (3.1 & 4.6.1.6): Type I – 1.10 lbs. (499 g); Type II - 0.65 lbs. (295 g);  
Type III – 1.16 lbs (526 g)

Capacity test requirements (3.6 & 4.6.4), Type I:

Test	Initial voltage delay		Minimum Capacity		Cut-off Volts
	Time (MAX)	to Volts			
I	1 second	11.0	5.0 hours		11.0
L	1 second	11.0	2.6 hours		11.0
H	1 second	11.0	4.6 hours		11.0
Storage Period					
			1-Week	4-Week	
IT	1 second	11.0	4.6 hours	4.5 hours	11.0
LT	1 second	11.0	2.4 hours	2.3 hours	11.0
HT	1 second	11.0	4.3 hours	4.1 hours	11.0

Capacity test requirements (3.6 & 4.6.4), Type II:

Test	Initial voltage delay		Minimum Capacity		Cut-off Volts
	Time (MAX)	to Volts			
I	5 seconds	11.0	3.6 hours		11.0
L	60 seconds	11.0	1.8 hours		11.0
H	5 seconds	11.0	3.3 hours		11.0
LR	5 seconds	11.0	49.0 hours		1.5
Storage Period					
			1-Week	4-Week	
IT	5 seconds	11.0	3.3 hours	3.2 hours	11.0
LT	60 seconds	11.0	1.7 hours	1.6 hours	11.0
HT	5 seconds	11.0	3.1 hours	3.0 hours	11.0
LRT	5 seconds	11.0	45.6 hours	44.1 hours	1.5

Capacity test requirements (3.6 & 4.6.4), Type III:

Test	Initial voltage delay		Minimum Capacity		Cut-off Volts
	Time (MAX)	to Volts			
I	1 second	11.0	6.0 hours		11.0
L	1 second	11.0	2.6 hours		11.0
H	1 second	11.0	5.5 hours		11.0
Storage Period					
			1-Week	4-Week	
IT	1 second	11.0	5.6 hours	5.4 hours	11.0
LT	1 second	11.0	2.4 hours	2.3 hours	11.0
HT	1 second	11.0	5.1 hours	5.0 hours	11.0

Abuse test pulse discharge capacity requirement (3.5.12 & 4.6.1.12i): Type I – 3.7 ampere-hours; Type II – 2.6 ampere-hours; Type III – 4.5 ampere-hours.

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## 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 for each battery type as indicated below:

Test Requirement	Specification Reference	Applicability by PIN Suffix (M32271/4-)				
		12C	12E	22C	22E	32E
Parallel discharges	Tables III, IV, IX, & XI	Yes	Yes	Yes	Yes	Yes
Connectors	4.6.1.7	Yes	Yes	Yes	Yes	Yes
Battery charger connection	4.6.1.7.1	Yes	Yes	Yes	Yes	Yes
Static connection integrity	4.6.1.7.2	No	No	No	No	No
Dynamic connection integrity	4.6.1.7.3	No	No	No	No	No
Terminal integrity	4.6.1.8	No	No	No	No	No
Complete discharge device	4.6.1.9	Yes	Yes	Yes	Yes	Yes
State of charge device	4.6.1.10	No	Yes	No	Yes	Yes
State of charge data output	4.6.1.10	No	Yes	No	Yes	Yes
Cell charging	4.6.2.3	Yes	Yes	Yes	Yes	Yes
Nail penetration	4.6.2.4	Yes	Yes	No	No	Yes
Cell series string short	4.6.2.6	Yes	Yes	No	No	Yes
Parallel string charge protection <sup>3</sup>	4.6.2.6.1	Yes	Yes	No	No	Yes
Charge protection	4.6.2.11	Yes	Yes	Yes	Yes	Yes
Battery over-current protection	4.6.2.13	Yes	Yes	Yes	Yes	Yes
Battery over-temperature protection	4.6.2.14	Yes	Yes	Yes	Yes	Yes
Surface temperature	4.6.4.1	Yes	Yes	Yes	Yes	Yes
Capacity LR	4.6.4.1.5	No	No	Yes	Yes	No
Capacity LRT	4.6.4.1.9	No	No	Yes	Yes	No
Immersion	4.6.5.8	Yes	Yes	Yes	Yes	Yes
Watertight integrity	4.6.5.9	No	No	No	No	No

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 0.8 amperes constant current, 2.5 ohms constant resistance, or 1.6 watts constant power. In the event that parallel cell arrangements are used (Types I and III only), use a load that produces a current equivalent to 0.8 amperes 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 each battery with 13.75 ohms, 0.8 amperes, or 8.8 watts.

Abuse test, pre-discharge: When tested as specified in 4.6.2.12a, discharge with a load of 0.8 amperes for 2.5 hours for Type I batteries, 1.8 hours for Type II batteries, or 3.0 hours for Type III batteries.

<sup>3</sup> This test only required if parallel cell arrangements are used for Type I or III batteries

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Abuse test, pulse discharge: When tested as specified in 4.6.2.12i, discharge with a load of 1.0 ampere for 1 minute followed by 0.72 amperes for 4 minutes, cycled continuously to 11.0 volts.

Battery over-current protection: When tested as specified in 4.6.2.13, load batteries with either 1.6 amperes or 19 watts.

Immersion: When tested as specified in 4.6.5.8, apply a load of 60 milli-amperes during the storage and immersion time periods specified.

Capacity tests (4.6.4):

Test	Discharge Rate	Duty Cycle
I	0.8 amperes	Continuous discharge to cut-off volts, followed by 0.8 amperes To zero volts, then 0.8 amperes forced discharge for 10 minutes.
L	0.8 amperes	Continuous discharge to cut-off voltage
H	0.8 amperes	Continuous discharge to cut-off voltage
LR	65 mA/1.1W	Continuous discharge at 65 milli-amperes to 10.5 volts, then Discharge at 1.1 watts to cut-off voltage
IT	0.8 amperes	Continuous discharge to cut-off voltage
LT	0.8 amperes	Continuous discharge to cut-off voltage
HT	0.8 amperes	Continuous discharge to cut-off voltage
LRT	65 mA/1.1W	Continuous discharge at 65 milli-amperes to 10.5 volts, then Discharge at 1.1 watts to cut-off voltage

NOTES:

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

Intended use: This battery is intended for use in squad-level radio sets. It is also used to power some types of motor/blowers used in respiratory protection for aircraft pilots and aircrews.

<sup>4</sup>Nominal ratings: The following are the nominal ratings for the battery types described by this specification sheet. They are provided for information purposes.

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<sup>4</sup> 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>.

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<b>Battery PIN:</b>	<b>M32271/4-12C or -12E (Li/MnO<sub>2</sub>)</b>	<b>M32271/4-22C or -22E (Li/SO<sub>2</sub>)</b>	<b>M32271/4-32E (Li/MnO<sub>2</sub>)</b>
<i>Overall Dimensions:</i>	3.9 in. H x 3.55 in. W x 1.2 in. D		
<i>MAX Weight:</i>	1.10 lbs (499 grams)	0.65 lbs (295 grams)	1.16 lbs (526 grams)
<i>Voltage Range:</i>	11.0 – 16.5	11.0 - 15.25	11.0 – 16.5
<i>Nominal Capacity (Ampere-hours):</i>	4.0 Amp-hrs	2.88 Amp-hrs	4.8 Amp-hrs
<i>Nominal Energy (Watt- hours):</i>	48 Watt-hrs	34.5 Watt-hrs	57 Watt-hours
<i>MAX Rated Power Output:</i>	10 Watts		
<i>MAX Continuous Load Rating:</i>	0.8 Amperes		
<i>MAX Pulse Rating:</i>	1.0 Amperes		
<i>Instantaneous Trip Rating:</i>	1.6 Amperes		
<i>Operating Temperature Range:</i>	-20 to 130°F (-29 to 55°C)		-4 to 130°F (-20 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)		172°F (78°C)

Other data:

**Military Type Designations.** The military type designations that relate to the PINs covered by this specification sheet are as follows: The BA-5388()/U designation has been used for the Type I PIN; the BA-5588()/U designation has been used for the Type II PIN; and the BA-7588()/U designation has been considered for prototypes of the Type III PIN.

All battery types covered by this specification sheet are subject to the transportation requirements of 49 CFR 173.185. Types I & III have solid cathodes and more than 2.0 grams of lithium content; Type II has a liquid cathode and more than 1.0 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.

All battery types covered by this specification sheet include a complete discharge device in order to render the battery non-reactive after use. If a 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.

The US Army CECOM Life Cycle Management Command (LCMC) publishes guidelines for the design of battery compartments for devices using the Types I and II batteries covered by this specification sheet: Technical Bulletin CECOM-TB-7. Please contact the CECOM LCMC Directorate for Safety at [nonm-amselsfsec@conus.army.mil](mailto:nonm-amselsfsec@conus.army.mil) for further information.

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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.

## Custodians:

Army – CR  
Navy – NW  
Air Force – 99  
DLA – GS

## Preparing activity:

Army – CR  
(Project Number 6135-2006-007)

## Review activities:

Navy – SH, AS, MC  
Air Force – 71

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