RADIANTPOWERCORP A HEICO COMPANY
DUKANE SEACOM A HEICO COMPANY
RADIANT SEACOM REPAIRS A HEICO COMPANY
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8 June 2022

Subject: Safety Data Sheets (SDS) for Lithium Metal Batteries installed in Dukane Seacom Beacon Products

To Whom It May Concern:

Dukane Seacom currently uses multiple lithium metal batteries sizes for DK series units depending on battery code listed on outside of unit. This designation can be found on the outside label of the beacon. All batteries have passed testing required by UN38.3 standards. All items listed below are considered "Cells" by IATA standards and should be packaged and shipped in accordance with current IATA and local regulatory requirements. Air Carriers may impose restrictions beyond the IATA requirements. Check with your Air Carrier for any additional requirements.

Reference the guide below to identify the proper battery code. Attached to this document is the SDS and UN38.3 testing information from the cell manufacturer.
NOTE: For shipping purposes, any DK series **beacon** should be considered "Lithium Metal Batteries Contained in Equipment" not "Lithium Metal Batteries".

Reference Type	Dukane Battery Code	Dukane Part Number		Battery MFG Model Number	Number of Cells per Unit	Li Metal Content (g)	Battery Weight (g)	UN Shipping Information	UN 38.3 Testing
Beacons	C	DK100 DK120 DK130 DK140	DKM120 DKM480	BR-A	1	0.6	18	UN3091 PI970 Section II	PASSED
Battery Kits	C	810-2008/K	810-2013/K 810-2019/K	BR-A	1	0.6	18	UN3090 PI968 Section IB	PASSED
Beacons	B	DK100/90 DK120 N15B217B	DK470 DK228 DK485 DKM502/90	BR-C	1	1.7	42	UN3091 PI970 Section I	PASSED
Battery Kits	B	810-2007/K	810-2010/K 810-2017/K 810-2018/K 810-2020/K	BR-C	1	1.7	42	UN3090 PI968 Section IA	PASSED
Beacons	E	DKM502 DKM504		BR-AG	1	0.7	18	UN3091 PI970 Section II	PASSED
Battery Kits	E	810-2016/K		BR-AG	1	0.7	18	UN3090 PI968 Section IB	PASSED
Beacons	F	DK120/90 DK180		BR-C	1	1.7	42	UN3091 PI970 Section I	PASSED
Battery Kits	F	810-2042/K		BR-C	1	1.7	42	UN3090 PI968 Section IA	PASSED

Should you require any additional information, please do not hesitate to contact me at stancey@rpcaero.com or the telephone number listed above.

Sincerely,

Sean Tancey

Sean Tancey

Director of Quality

This product is used in a hermetically sealed state. So, it is not an object of the SDS system. This document is provided to customers as reference information for the safe handling of the product. The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Panasonic Corporation makes no warranty exp[redacted]

PRODUCT SA[redacted]

1 Chemical product and company identification

Name of Product	:	Poly-carbonmonofluoride lithium battery
Name of Company	:	Panasonic Energy Co., Ltd.
Address	:	1-1 Matsushita-cho, Moriguchi-city, Osaka, 570-8511, Japan
Emergency Contact	:	+81-80-9932-3190 (JST Working hours) +81-6-6991-1141 (Holiday)

2 Hazards identification

GHS Classification	:	No applicable
Toxicity	:	Vapor generated from burning batteries, may irritate eyes, skin and throat.
Hazard	:	Electrolyte and lithium metal are inflammable. Risk of explosion by fire if batteries are disposed in fire or heated above 100 degrees C. Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.

3 Composition/information of ingredients

Component	Material	CAS RN	Content (%)
Positive electrode	Poly-carbonmonofluoride	51311-17-2	14 - 27
Negative electrode	Lithium metal	7439-93-2	2 - 6
Electrolyte	Gamma-butyrolactone	96-48-0	13 - 30
Others	Steel	7439-89-6, 7440-47-3	25 - 60
(Steel or Plastic parts)	Polypropylene	9003-07-0	4 - 30

Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
BR-1/2AA	0.4	BR-2/3A	0.4	BR-A	0.6		
		BR-2/3AG	0.5	BR-AG	0.7		

4 First aid measures (in case of electrolyte leakage from the battery)

Eye contact : Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Get immediate medical treatment. If appropriate procedures are not taken, this may cause eye injury.

Skin contact : Wash the affected area under tepid running water using a mild soap. If appropriates procedures are not taken, this may cause sores on the skin. Get medical attention if irritation develops or persists.

Inhalation : Remove to fresh air immediately. Get medical treatment immediately.

5 Firefighting measures

Fire extinguishing agent : Alcohol-resistant foam and dry sand are effective.

Extinguishing method : Be sure on the windward to extinguish the fire, since vapor may make eyes, nose and throat irritate, Wear the respiratory protection equipment in some cases.

6 Accidental release measures (in case of electrolyte leakage from the battery)

Take up with absorbent cloth, treat cloth as inflammable.
Move the battery away from the fire.

7 Handling and storage

Handling :

- When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing partitions in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not short-circuit, recharge, deform, throw into fire or disassemble.
- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Insert the battery correctly in electrical equipment.

Storage :

- Do not let water penetrate into packaging boxes during their storage and transportation.
- Do not store the battery in places of the high temperature or under direct sunlight.
- Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, rain or frozen condition

8. Exposure controls and personal protection

Acceptable concentration : Not specified about Lithium Battery.
Facilities : Nothing in particular.

Protective Equipment (in case of electrolyte leakage from the battery)
Respiratory Protection : For most condition no respiratory protection.
Hand Protection : Safety gloves.
Eye Protection : Safety goggle

9. Physical and chemical properties

Appearance : Cylindrical shape
Nominal Voltage : 3 V

10. Stability and reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.
As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. Toxicological information

Swallowing can lead to chemical bums, perforation of soft tissue, and death. Severe bums can occur within 2 hours of ingestion. Seek medical attention immediately

12. Ecological information

In case of the worn out battery was disposed in land, the battery case may be corroded, and leak electrolyte. However, there is no environmental impact information.
Mercury (Hg), Cadmium (Cd) and Lead (Pb) are not used in cell.

13. Disposal considerations

When the battery is worn out, dispose of iunder the ordinance of each local government.

14. Transport information

Handling

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.
During the transportation do not allow packages to be dropped or damaged.

Proper shipping name : Lithium metal batteries

UN Number, UN Class : UN3090, Class9 (for the Air transport by PI968 Section IA or IB)

: Exemption (for thc Marinc transport SP188 and thc Air transport by Section II of PI 969 or 970)
Even though the cells are classified as lithium metal batteries (UN3090 or UN3091), they are not subject to some requirements of Dangerous Goods Regulations because they meet the following:
1. for cells, the lithium content is not more than 1 g ;

2. each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, PartⅢ, sub-section 38.3 ;
3. each cell is manufactured in ISO9001 certified factory ;
4. the test summary is available from ;
https://industrial.panasonic.com/ww/downloads/battery-test-summary

Please refer to the following reference information about [redacted]
content of packaging label and shipping documents varies by shipping companies. Make sure to confirm in advance with your shipping company.

Information of reference

	Reference	Packing Instruction(PI)/ Special provision(SP)	Note
Air transport	IATA DGR	PI 968 Section I A	Cells, Cargo Aircraft only; Net quantity per package Max. 35kg
		PI 968 Section I B	Cells, Cargo Aircraft only; net quantity per package Max. 2.5kg
		PI 969 Section Ⅱ	Cells packed with equipment
		PI 970 Section Ⅱ	Cells contained in equipment
Marine transport	IMDG Code	SP 188	

15. Regulatory information

- IATA Dangerous Goods Regulations Edition 63 (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2020 Edition (IMDG Code)
- UN Recommendations on the Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on the Transportation of Dangerous Goods, Manual of Tests and Criteria
- EU Battery Directive (2006/66/EC, 2013/56/EU)
- Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- Act on Preventing Environmental Pollution of Mercury (Japan)

16. Other information

This PSDS is provided to customers as reference information in order to handle batteries safely.
It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling, based on this information.

Prepared by : Engineering Department
Energy Device Business Division
Panasonic Energy Co., Ltd.

Panasonic

No. 2022-0000025560

Lithium Battery Test Summary / UN38.3 試験結果要約

Product manufacturer	Panasonic Corporation
Address/住所	1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan
Telephone/電話番号	+81-80-9932-3190 (JST Working hours)
e-mail	un38.3_microbattery@ml.jp.panasonic.com
URL	https://www.panasonic.com/global/home.html
Test laboratory	Panasonic Corporation
Address/住所	1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan
Telephone/電話番号	+81-80-9932-3190 (JST W
e-mail	un38.3_mic
URL	https://ww

Description of Product / 製品情報

Model Number/品番	BR-AG
Type/タイプ	Lithium metal cell
Physical description/物理特性	Non-rechargeable, Cylindrical
Mass/質量	18 g
Lithium content/リチウム含有量	0.7 g
Watt-hour rating/ワット時定格値	Not applica ble
Nominal Voltage/公称電圧	3.0 V
Nominal Capacity/公称容量	2200 mAh

Test Results / 結果

Identification number/番号	CP0051-1
Date of test report/レポート発行日	2015/04/09
Reference edition/参照	UN Manual of Tests and Criteria, Revision 5 with Amendment 2

UN Manual of Tests and Criteria 国連勧告テスト判定基準	Results 結果	Remarks 備考
T1 : Altitude simulation /高度ｼｭﾐﾚｰｼｮﾝ	Pass / 合格	
T2 : Thermal Test / 温度試験	Pass / 合格	
T3 : Vibration / 振動	Pass / 合格	
T4 : Shock / 衝撃	Pass / 合格	
T5 : External short circuit / 外部短絡	Pass / 合格	
T6 : Impact / 衝突、Crush / 圧壊	Pass / 合格	Crush / 圧壊
T7 : Overcharge / 過充電	-	for rechargeable batteries only / 充電式電池のみ
T8 : Forced discharge / 強制放電	Pass / 合格	

Hereby we certify that this model of Lithium battery mets the requirements of each test in theUN Manual of Tests and Criteria Part III, sub-section 38.3.
上記テストは国連勧告テスト(Manual of Tests and Criteria, art III, sub-section 38.3.)に従い確認された結果であることを証明致します。

Signature: K. Amano

Name and Title: Kazuyuki Amano / Manager

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