

January 29, 2014

# Products Information Data Sheet

These products are hermetically sealed state in a vessel, and are exempted from Material Safety Data Sheet regulations. However, this manual provides you with referential information to safely use the products.

## Section 1 - Products and Company Identification

Products name	:	Coin-type Manganese Dioxide Lithium Batteries (CRC)
Products sizes	:	CR1216 CR1220 CR1616 CR2016 CR2025 CR2032 CR2430 CR2450
Company	:	TOSHIBA HOME APPLIANCES CORPORATION
Address	:	2-15, Sotokanda 2-Chome, Chiyoda-Ku, Tokyo 101-0021, Japan
Telephone	:	+81-3-3257-5871
Fax	:	+81-3-3257-5916

## Section 2 - Composition/ Information on Ingredients

Ingredients	CAS#	PRTR	Weight/Content
Lithium metal (Li)	7439-93-2	Not regulated	Shown at *1
Manganese dioxide (MnO <sub>2</sub> )	1313-13-9	1-412	20~40 wt%
Graphite (C)	7782-42-5	Not regulated	2~3 wt%
Dimethoxyethane (C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> )	110-71-4	Not regulated	5~10 wt%
Propylene carbonate (C <sub>4</sub> H <sub>6</sub> O <sub>3</sub> )	108-32-7	Not regulated	

\*1 : Lithium metal weight (g) as standard

CR1216	0.009	CR2025	0.050
CR1220	0.013	CR2032	0.060
CR1616	0.020	CR2430	0.090
CR2016	0.030	CR2450	0.180

## Section 3 - Summary of Danger and Toxicity

Fatal danger and toxicity	:	No information available
Danger and toxicity	:	<u>Chemical ingredient is hermetically sealed in a vessel, so the product is neither dangerous nor toxic as a cell.</u> The cell shapes like a small coin, so be careful that particularly a little child may accidentally swallow it. If the lithium metal of contents touches the skin, a chemical burn is caused. In addition, the lithium metal is oxidized and creates corrosive lithium oxide. If reacting with water, lithium metal produces hydrogen gas that may fire as a combustible gas. If a cell burnt, generated steam may stimulate eyes, skin, and throat.
Effect to environment	:	No information available
Overview of prospective emergency	:	A cell may break or be shorted by an external mechanical or electrical stress.

#### Section 4 - First Aid Measures

There is no problem in the normal state. But take the following measures when the contents have begun to leak by the destruction of the battery.

- |            |   |  |
|------------|---|--|
| Inhalation | : | If a person inhaled steam, move to the place where air is fresh immediately. If he/her feels ill, immediately call a doctor for therapy and treatment. |
| Skin       | : | If the content adheres to skin, immediately wash it with a large amount of clean water and soap promptly. If irritating, consult a doctor.             |
| Eyes       | : | If the content enters eyes, rinse eyes with a large amount of clean water for more than 15 minutes, and consult a doctor.                              |
| Ingestion  | : | If a cell is swallowed, immediately call a doctor for therapy and treatment.   |

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#### Section 5 - Fire Fighting Measures

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|---------------------------------------|---|---|
| Fire extinguishers                    | : | CO <sub>2</sub> , dry chemical  |
| Specific fire fighting method         | : | In the initial state of a fire, move cells/batteries from near the fire source, to a safe location. At that time, work at a windward location, as far as possible, and be sure to put on a protective breathing mask. |
| Protection of fire fighting personnel | : | Be wear protective breathing masks, gloves, glasses and helmet for the keeping safe. (Preferably, use a self-feeding type mask.)  |

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#### Section 6 - Action upon Leakage and Removing Method

A cell hermetically contains constituents in a vessel, so contents normally may not leak out. However, if the contents leaks because of a mechanical or electrical stress, scatter dry sand to absorb it, and collect the sand in a vessel. If lithium metal leaks, there is a firing potential because of a reaction with moisture in the atmosphere and reaction heat. At that time, be sure to put on a protective-breathing mask. (Preferably, use a self-feeding type mask.)

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#### Section 7 - Handling and Storage

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|----------|---|--|
| Handling | : | Any leakage or obnoxious odor of a cell, it should be disposed. Never solder a cell body. Do not contact cell terminals between each other, or with another conductor. Neither throws into fire, decompose, heat, dent, deform, charge nor drop a battery. Do not dip a cell in water or seawater.   |
| Storage  | : | Store cells without direct sunlight, high temperature, high humidity, rain, dew, etc., and select a storage location with a temperature as low as possible (preferable temperature 20+/-15°C and relative humidity 70% or less). In addition, keep cells away from dangerous matter such as combustible or ignitable materials. Absolutely never place a cell in contact with a combustible or conductive substance. Prepare appropriate firefighting equipment. |
| Note     | : | See handling and storing precautions described in the product catalog, specification, etc.   |

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**Section 8 - Prevention from Exposure**

Protection of respiratory organs	:	Not required in a normal operating state
Protection of eyes	:	Not required in a normal operating state
Other protective tools etc.	:	Not required in a normal operating state

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**Section 9 - Physical and Chemical Properties**

Shape	:	Coin-shape. Contents are sealed in a stiff stainless steel vessel.
PH	:	Not applicable because a cell is not soluble with water.
Boiling point/boiling range	:	No information
Melting point	:	No information
Decomposition temperature	:	No information
Flash point	:	No information

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**Section 10 - Stability and Reactivity**

Conditions to be avoided	:	If a number of cells are mixed up without insulating terminals, they may short and possibly heat, break and ignite. When a cell is charged, possibly in bursting the electrolyte etc. Or, it may possibly burst or fire. If a cell is heated or thrown into fire, it may explode or fire with the electrolyte etc. bursting from inside of the cell. If decomposed, there is a possibility of overheating or fire due to short circuit, and ignition of some material around etc.
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**Section 11 - Information on Toxicity**

There is no toxicity because chemical substances are hermetically sealed in a metal vessel.

As a reference, chemical substances composing a cell are described below.

**Lithium metal**

Acute toxicity	:	No appropriate report available
Local effect	:	A skin contact may result in inflammation.

**Manganese dioxide**

Acute toxicity	:	L <sub>D</sub> LO:45 mg/kg (Intravenous injection, rabbit) L <sub>D</sub> :422 mg/kg (Hypodermic injection, mouse)
Irritation	:	Irritating eyes, nose, throat and skin.
Chronic toxicity	:	If a person is exposed to powder for a long time or repeatedly, the lung and the nervous system may be affected, possibly causing bronchitis, pneumonia, nervous disease or mental disease.
Procreation toxicity	:	TCL <sub>O</sub> :49mg/m <sup>3</sup> (Inhalation, mouse)

**Graphite**

Chronic toxicity	:	If inhaled for a long time without protective tools, local ventilation, etc., graphite lung may result.
Breathing toxicity	:	If inhaled for a long time without protective tools, local ventilation, etc., graphite lung may result.

Dimethoxyethane		
Irritation	:	Irritating and possibly causing inflammation
Acute toxicity	:	L <sub>D50</sub> :7kg/kg (Rat oral)
Chronic toxicity	:	Long-term exposure may cause inflammation. If exposed further, liver or kidney may be troubled.
Teratogenicity	:	Acknowledged to have Teratogenicity through experiments on animals.
Propylene carbonate		
Irritation	:	Irritating skin and eyes
Acute toxicity	:	L <sub>D50</sub> :29kg/kg (Rat oral)

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## Section 12 - Ecological Information

No information as batteries.

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## Section 13 - Disposal Precautions

Disposal of the substance should be done according to the laws and regulations.

Although used cells can be discarded basically as "nonflammable refuse," some local governments sort and collect them at their own discretion. Therefore, observe instructions of the government you belong to, to dispose of the substance.

Keep the following discarding precautions:

- Even a used cell sometimes stores electric energy. Therefore, to prevent the battery from short-circuit, isolate cells from each other by a method such as taping +, - terminals of cells, or using the individual housing case of a cell, used when you bought the battery, and orderly encasing batteries in a box, then submit an application of disposal to the local government of your residence, using the designated form.
- Packing cells so that they are not shorted, and prevent the package from being wetted.
- If cells must be discarded in a country other than Japan, observe the instructions of the country and local government.

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## Section 14 - Transportation Precautions

It is required to perform the confirmation such as laws and ordinances / the regulation about the transportation by shipper responsibility. After our product was delivered to a customer, if a customer transports a product as a shipper, it is necessary to confirm laws and ordinances / regulation with the customer. The following information is not things to guarantee with a thing to offer as reference information about the transportation.

The Thionyl chloride lithium batteries are classified in UN recommendation as follows.

- Proper Shipping Name/Description : LITHIUM METAL BATTERIES
- UN Number : UN3090  
( When cell/batteries contained in equipment and packed with equipment, it is UN3091)
- Class or Div.(Su) : Class9 (Miscellaneous Dangerous Goods)
- Packing Group : II

The other major transportation regulation is as follows.

Area	Method	Regulations
International	Air	ICAO-TI/IATA-DGR
International	Water	IMO-IMDG Code
U.S.A	Air, Rail, Highway, Water	US DOT-49 CFR
Europe	Rail, Highway	RID,ADR

Their regulations are based on the UN Recommendations. Each special provision provides specifications on exceptions and packaging for lithium metal batteries shipping. The products can be transported as "Non Dangerous Goods" when they meet the requirements of Packing Instruction 968 Section II or 969 Section II or 970 Section II of IATA-DGR (54<sup>th</sup> Edition) of IMO-IMDG Code (2010 Edition).

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### Section 15 - Applicable Laws and Regulations

The laws and ordinances about the battery obey laws and ordinances set in each country.

Major applicable regulations for the transportation of lithium metal cells and batteries are as follows:

- Recommendations on the Transport of Dangerous Goods, 17<sup>th</sup> Revised Edition (UN)
- Dangerous Goods Regulations, 54<sup>th</sup> Edition (IATA)
- Technical Instructions for the Safety Transport of Dangerous Goods by Air, 2013-2014 Edition (ICAO)
- International Maritime Dangerous Goods (IMDG) Code, 2010 Edition (IMO)

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### Section 16 - Other Information

The battery is considered to be an article for purposes of the TSCA and not a chemical. Therefore, the battery is exempt from the TSCA requirements.

Contents of this manual have been edited based on data, information, etc. that Toshiba could acquire when editing the manual, so the manual may be revised by new information, if any. Contents of the manual assume normal handling of batteries, and are provided as referential information. Therefore, the manual provides no warranties. The customer is requested to use batteries on the basis of appropriate measures established depending on individual conditions, application and operation. Any numerals such as contents and concentration ranges, and others are not guaranteed.

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Prepared Day	:	December 24, 2008
Revised Day	:	January 01, 2013
Preparation This Sheet	:	TOSHIBA HOME APPLIANCES CORPORATION Procurement Group Planning & Procurement Dept. Battery Business Div.

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This product is a consumer product which 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 expressed or implied.

## PRODUCT SAFETY DATA SHEET

### 1 Product and Company Identification

Name of Product : Manganese dioxide lithium battery  
 Name of Company : Panasonic Corporation, Automotive & Industrial Systems Company  
 Address : 1-1 Matsushita-cho, Moriguchi City, Osaka, 570-8511, Japan  
 Division : Energy Device Division  
 Department : Engineering Department  
 Telephone number : +81-6-6994-4537

### 2 Hazards Identification

GHS Classification : Not applicable

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.

Toxicity : Vapor generated from burning batteries, may irritate eyes, skin and throat.

### 3 Composition/Information of Ingredients

Component	Material	CAS No.	Content
Positive electrode	Manganese dioxide	1313-13-9	12 ~ 50wt%
Negative electrode	Lithium metal	7439-93-2	0.5 ~ 6wt%
Electrolyte	1,2-dimethoxyethane	110-71-4	1.5 ~ 3.5wt%
	Lithium Perchlorate	7791-03-9	0.2 ~ 0.7wt%
	Organic electrolyte	-	2.5 ~ 7wt%
Others (Steel or Plastic parts)	Steel	7439-89-6, 7440-47-3	30 ~ 85wt%
	Polypropylene	9003-07-0	0.5 ~ 10wt%

#### Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
CR1025	0.008	CR1620	0.02	CR2330	0.08	CR2412	0.03
CR1216	0.008	CR1632	0.04	CR2354	0.17	CR2430	0.09
CR1220	0.01	CR2012	0.02			CR2450	0.18
CR1612	0.01	CR2016	0.03			CR2450A	0.17
CR1616	0.02	CR2025	0.05			CR2477	0.29
		CR2032	0.07			CR3032	0.15
		CR2050B	0.10				

## 4 First Aid Measures

The product contains organic electrolyte. In case of electrolyte leakage from the battery, actions described below are required.

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 contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.

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

## 5 Fire Fighting Measures

Extinguishing method : Since vapor, generated from burning batteries may make eyes, nose and throat irritates, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

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

## 6 Accidental Release Measures (in case of electrolyte leakage from the battery)

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

## 7 Handling and Storage

- I 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.
- I Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- I Do not recharge batteries. Do not deform batteries.
- I Do not mix different type of batteries.
- I Do not solder directly onto batteries.
- I Do not let water penetrate into packaging boxes during their storage and transportation.
- I Do not store the battery in places of the high temperature or under direct sunlight.
- I 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 (in case of electrolyte leakage from the battery)

- Acceptable concentration : Not specified in ACGIH.
- Facilities : Provide appropriate ventilation system such as local ventilator in the storage place.
- Protective clothing : Self-Contained Breathing Apparatus for organic gases, safety goggle, and safety glove.

## 9 Physical and Chemical Properties

Appearance : Coin shape  
Voltage : 3 volts

## 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 (in case of electrolyte leakage from the battery)

Acute toxicity : Oral(rat) LD50 > 2,000mg/kg (estimated)  
Irritation : Irritating to eye and skin.  
Mutagenicity : Not specified.  
Chronic toxicity : Not specified.

## 12 Ecological Information

In case the worn-out battery is disposed of on land, the battery case may corrode and leak electrolyte.

## 13 Disposal Considerations

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

## 14 Transport Information

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.

UN Number : Even though the cells are classified as lithium metal batteries (UN3090 or 3091), they are exempted from Dangerous Goods because they meet the following:  
1. for cells, the lithium content is not more than 0.3g;  
2. each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part , sub-section 38.3.  
3. each cell is manufactured in ISO9001 certified factory.

Proper shipping Name : Lithium metal batteries

UN Class : Not Applicable



Please refer to the following reference information about concrete ways of transportation. Actual 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 (Reference number)	Special provision	Note
Air transport	IATA (2)	Packing Instruction 968 Section	Cells
		Packing Instruction 969 Section	Cells packed with equipment
		Packing Instruction 970 Section	Cells contained in equipment
Marine transport	IMDG (3)	Special provision 188	

## 15 Regulatory Information

IATA Dangerous Goods Regulations

IMO International Maritime Dangerous Goods Code

## 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.

In California only, packages that contain CR lithium coin cells and the Owners/Operating Instructions of products that contain CR lithium coin cells must include the following statement: "Perchlorate Material - special handling may apply, See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)".

The effective date for this Perchlorate label is July 1, 2006 for non-consumer products and January 1, 2007 for consumer products.

#### References

- (1) UN Recommendations on the Transportation of Dangerous Goods, Model Regulations
- (2) IATA Dangerous Goods Regulations 57th Edition ( 2016 )
- (3) IMO International Maritime Dangerous Goods Code 2014 Edition
- (4) UN Recommendations on the Transportation of Dangerous Goods, Manual of Tests and Criteria

(END)