

# MATERIAL SAFETY DATA SHEET

## SECTION 1 Chemical Product & Company

Product Name	Nickel / Metal-hydride Battery
Type	EV-MP6R5R02
Company Name	Panasonic EV Energy Co., Ltd.
Address	555 Sakaijyuku, Kosai, Shizuoka, 431-0452 JAPAN
Emergency Telephone Number	+81-53-577-3112 Osamu Takahashi
Data Prepared	Sep. 19, 2003

## SECTION 2 Hazardous Ingredients / Identity Information

Hazardous Components	Other Limits															
Specific Chemical Identity : Common Name(s)	OSHA PEL ACGIH TLV Recommended Formulation(%) W/V															
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Ni(OH)<sub>2</sub></td> <td style="width: 20%;">0~16%</td> <td style="width: 20%;">W</td> </tr> <tr> <td>NiOOH</td> <td>1~17%</td> <td>W</td> </tr> <tr> <td>MmNiCoMnAl</td> <td>2~21%</td> <td>W</td> </tr> <tr> <td>(MmNiCoMnAl)Hx</td> <td>3~22%</td> <td>W</td> </tr> <tr> <td>KOH,NaOH and LiOH</td> <td>14%</td> <td>W</td> </tr> </table>	Ni(OH) <sub>2</sub>	0~16%	W	NiOOH	1~17%	W	MmNiCoMnAl	2~21%	W	(MmNiCoMnAl)Hx	3~22%	W	KOH,NaOH and LiOH	14%	W
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	Other Material : Battery Cases:Plastics(PPE/PP/HSBBC/HSIBC Blend) PPE: Poly Phenylene Ether PP: Polypropylene HSBBC: Hydrogenated Styrene Butadiene Block Copolymer HSIBC: Hydrogenated Styrene Isoprene Block Copolymer Separator: Polypropylene-Polyolefine mixed Sheet															

## SECTION 3 Physical / Chemical Characteristics

Specific Gravity(H <sub>2</sub> O=1)	1.9
Melting Point	N/A
Vapor Pressure(kgf/cm <sup>2</sup> )	N/A
Vapor Density(Air=1)	N/A
Evaporation Rate (Butyl Acetate=1)	N/A
Solubility in Water(V/V)	N/A

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## Appearance and Odor

Note: ●Nickel/Metal-hydride battery is solid and sealed in the plastics case. And it will not generate any gas in the static situation. In the atmosphere, it keeps the solid situation and also in the water.

●In the non-static situation it may generate oxygen(O<sub>2</sub>) in the overcharges status and hydrogen (H<sub>2</sub>) in the overdiscarged status. As there is a safety vent inside of the Nickel/Metal-hydride battry, those gases may be out of the case to the atmosphere. Speed and volume gas generation depend on the charging or discharging condition.

## SECTION 4 Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A
Flammeable Limits	
LEL	
UEL	

Note: ●No flash and explosion in the normal situation.

●Flash may be possible in the following cases:

- Sparking in the case of the short-circuit.
- Intentionally discharging the cell and / or the module battery with the extremely high current.

●Explosion may be possible in the following cases:

- Cell itself will not have explosion if abused because of its safety vent machanism. However in the case that cell were housed in the completed sealed vessel, cell will have the status of possible explosion with the ignition source because of combination of oxygen(O<sub>2</sub>) and hydrogen(H<sub>2</sub>) generated by the cell.

●Unusual fire and explosion hazards.

Extinguishing Media	<ul style="list-style-type: none"> <li>· Use the power-type ABC fire extinguisher.</li> <li>· Use CO<sub>2</sub>, sand, or a lot of water if the power-type ABC fire extinguisher is not available.</li> <li>· At the above both cases, do sprinkle extinguishable medicine directly onto the battery.</li> </ul>
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Special Fire Fighting Procedures	N/A
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## Unusual fire and explosion hazards

- In the abnormal usage, there is the possibility of explosion.
- The abnormal usage condition:
  - Cell was overcharged or overdischarged.
  - The temperature of cell was higher than 100°C.
  - In the complete sealed vessel, the cell discharged and charged exist by the ignition source.

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## SECTION 5 Reactivity Data

Stability	Unstatic		Conditions to Avoid
	Stable	Static	○
Incompatibility (Materials to Avoid)	N/A		

Hazardous Decomposition or Byproducts

- Disassembling the module battery
  - Danger of short-circuit
  
- Disassembling the single cell
  - Danger of short-circuit
  - Alkaline liquid leak out.
  - Alkaline liquid contact to the skin.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will not Occur	○	

## SECTION 6 Health Hazard Data

Route(s) Entry:

- In the normal condition  
N/A
- In the abnormal conditon

See Emergency and First Aid Proceures on the following page.

Health Hazards(Acute and Chronic)

Will not give any hazards in the long run.

However, leaked alkaline liquid may damage the skin if contacted.

Carcinogenicity: ●TNP                      ●IARC Monographs                      ●OSHA Regulated

▪No Carcinogen

Signs and Symptoms of Exposure                      -

Medical Conditions                      -

Generally Aggravated by Exposure

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## Emergency and First Aid Procedures

(A) In case the battery case is cracked and broken:

• Alkaline electrolyte flows out. If your skin and eye contact it, it causes very serious sore.

Element of alkaline electrolyte : KOH, NaOH, LiOH(PH<sub>14</sub>)

(B) In case the battery is burned:

A mixed steam is generated. If you inhale it a lot, it causes a stimulation of the mucous membrane, giddiness or vomit.

Main element of a mixed steam:

Carbon monoxide(CO), Carbon dioxide(CO<sub>2</sub>), Sulfur oxide(SO<sub>x</sub>) 1,3-Butadiene(C<sub>4</sub>H<sub>6</sub>), Benzene(C<sub>6</sub>H<sub>6</sub>), Toluene(C<sub>7</sub>H<sub>8</sub>), Styrene(C<sub>8</sub>H<sub>8</sub>), and alkaline mist of KOH, NaOH and LiOH.

## Emergency treatment(See Section 8)

(A) In case the alkaline electrolyte happen to put into your eye;

Immediately wash your eyes for more than 15 minutes(in every nook and corner of eyelid, including inside of it) with a lot of water and then promptly receive medical treatment from a doctor(oculist).

(B) In case the alkaline electrolyte contact your skin;

Immediately wash it off with a lot of water. And quickly take off clothes and shoes polluted and then promptly receive medical treatment from a doctor.

(C) In case inhale a mixed steam or alkalinemist;

Avoid inhaling by standing on the windward side

If inhale, immediately wrap person in a blanket, keep quiet and move to another place where there is fresh air. Then carry out the inhalation of oxygen and also promptly receive medical treatment from a doctor.

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## SECTION 7 Precautions for Safe Handling and Use

### Steps To be Taken in Case Material is Released or Spilled

Don't disassemble the module and cell. If disassemble the module and the cell, should be stored under water immediately and precaution that alkaline liquid leaked out of the module and cell.

### Waste Disposal Method

Dispose of it based on the means instructed by car manufactures or distributors. Insulate the output terminal of module or battery-pack during transportation. The discharged condition is preferable for disposal.

### Precautions to Be Taken in Handling and Storing

Never short-circuit the cell and/or the module battery. If short-circuited, body may be burned or injured.

### Other Precautions

## SECTION 8 Control Measures

### Respiratory Protection (Specify Type)

- In the normal condition, it is not needed particularly.
- In the abnormal condition, use mist respirator if necessary.

Ventilation	Local Exhaust	Special
	Mechanical(General)	Other

### Note:

- It is never admitted to use the module battery in the complete sealed vessel.
- In the usage of the vessel, any ventilation holes are needed.

Protective Gloves	Rubber
Eye Protection	Wear splash proof goggles

### Note:

- In the normal condition, it is not needed particularly.
- In the abnormal condition, it is needed.

### Other Protective Clothing of Equipment

N/A

### Work / Hygienic Practices

N/A