

## MATERIAL DATA SHEET

Types	: V28PX, V76PX, V301, V303, V309, V315, V317, V319, V321, V329, V335, V339, V341, V344, V346, V350, V357, V361, V362, V364, V370, V371, V373, V377, V379, V381, V384, V386, V389, V390, V391, V392, V393, V394, V395, V396, V397, V399	
Chemical system	: Ag <sub>2</sub> O   KOH, NaOH   Zn	Date: 1998-05-06
Voltage	: 1.55 V; V28PX: 6.2 V	

### 1. TYPE AND WEIGHT

Cell Type	Weight (g)	Cell Type	Weight (g)
V28PX	11.1	V364	0.33
V76PX	2.4	V370	0.6
V301	1.78	V371	0.61
V303	2.33	V373	0.5
V309	1.08	V377	0.39
V315	0.4	V379	0.23
V317	0.18	V381	0.9
V319	0.25	V384	0.69
V321	0.25	V386	1.78
V329	0.6	V389	1.31
V335	0.15	V390	1.32
V339	0.22	V391	0.9
V341	0.27	V392	0.69
V344	1.49	V393	1.08
V346	0.3	V394	1.04
V350	1.49	V395	0.75
V357	2.33	V396	0.55
V361	0.4	V397	0.50
V362	0.4	V399	0.75

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	<ul style="list-style-type: none"> <li>- Silver oxide - Ag<sub>2</sub>O</li> <li>- Manganese dioxide - MnO<sub>2</sub></li> <li>- Zinc - Zn</li> <li>- Potassium hydroxide - KOH</li> <li>- Sodium hydroxide - NaOH</li> </ul>	13 - 34 0 - 14 5 - 10 0 - 3 0 - 2
Main passiv materials*	<ul style="list-style-type: none"> <li>- Steel</li> <li>- Copper</li> <li>- Nickel</li> <li>- Mercury</li> <li>- Plastic</li> </ul>	26 - 57 2 - 5 1 - 13 0.2 - 0.6 2 - 7

\* All cell types are sealed button cells or button cell batteries, no chemical hazard will be posed as long as the cell remains in sealed condition.

### 3. SAFETY GUIDELINE

- 3.1 Keep out of the reach of children. If swallowed, contact a physician at once.
- 3.2 Do not heat. Nor dispose in fire. May burst or release toxic materials.
- 3.3 Avoid forced discharge.
- 3.4 Do not short circuit, may cause burns.
- 3.5 Do not charge.
- 3.6 Do not solder the battery directly.
- 3.7 Do not disassemble, apply excessive pressure or deform.
- 3.8 Battery compartment should provide sufficient space for battery to expand in case of abuse.
- 3.9 Either battery compartment or battery connector should have a design that makes it impossible to place the battery in reverse polarity.
- 3.10 Equipment intended for use by children should have tamper-proof battery compartment.
- 3.11 Battery of different electrochemical system, grades, or brands should not be mixed.
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Prepared by : Dr. Ermisch	Approved by : Dr.Holl
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## MATERIAL DATA SHEET

Types : V4034PX, V72PX, V74PX, V3GA, V8GA, V10GA, V12GA, V13GA, V23GA, V625L

Chemical system : MnO<sub>2</sub> | KOH, NaOH | Zn

Date: 1998-05-06

### 1. TYPE, VOLTAGE, CAPACITY AND WEIGHT

Cell Type	Voltage (V)	Weight (g)
V4034PX	6.0	10.4
V72PX	22.5	39.0
V74PX	15.0	14.0
V3GA	1.5	0.6
V8GA	1.5	0.8
V10GA	1.5	1.1
V12GA	1.5	1.6
V13GA	1.5	1.8
V23GA	12.0	7.5
V625U	1.5	3.3

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Manganese dioxide - MnO <sub>2</sub> - Zinc - Zn - Potassium hydroxide - KOH - Sodium hydroxide - NaOH	14 - 30 5 - 11 2 - 4 0- 0.4
Main passiv materials*	- Steel - Copper - Nickel - Mercury - Plastic	40 - 60 2 - 6 1 - 3 0.2 - 0.5 2 - 14

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Prepared by : Dr. Ermisch

Approved by : Dr.Holl

## MATERIAL DATA SHEET

Types : V5AT, V10AT, V13AT, V 312AT, V675AT

Chemical system : Air Cathode | KOH | Zn

Date: 1998-05-06

Voltage : 1.4V

### 1. TYPE, CAPACITY AND WEIGHT

Cell Type	Weight (g)
V5AT	0.19
V10AT	0.30
V13AT	0.83
V312AT	0.58
V675AT	1.85

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Catalyst - Zinc - Zn - Potassium hydroxide - KOH	1 - 3 24 - 41 2 - 4
Main passiv materials*	- Steel - Copper - Nickel - Mercury - Plastic	29 - 50 2 - 4 2 - 6 0.8 - 1.4 4 - 7

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Approved by : Dr.Holl

## MATERIAL DATA SHEET

Types : CR1216, CR1220, CR1616, CR1620, CR2016, CR2025, CR2032, CR2320, CR2430, CR2450, CR1/3N, V28PXL, CR1/2AA, CR2/3AA, CAAA, CR2/3A, CR2NF  
 Chemical system : MnO<sub>2</sub> | DME, PC, LiClO<sub>4</sub> | Li Date: 1998-05-06

### 1. TYPE, VOLTAGE, CAPACITY AND WEIGHT

Cell Type	Voltage (V)	Weight (g)
CR1216	3.0	0.7
CR1220	3.0	0.8
CR1616	3.0	1.2
CR1620	3.0	1.2
CR2016	3.0	1.8
CR2025	3.0	2.5
CR2032	3.0	3.0
CR2320	3.0	2.9
CR2430	3.0	4.0
CR2450	3.0	6.2
CR1/3N	3.0	3.0
V28PXL	6.0	8.8
CR1/2AA	3.0	11.5
CR2/3AA	3.0	15.0
CAAA	3.0	21.5
CR2/3A	3.0	17.0
CR2NP	3.0	13.0

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Manganese dioxide - MnO <sub>2</sub> - Lithium - Li - Propylene carbonate - PC - 1.2 Dimethoxyethan - DME - Lithium perchlorate - LiClO <sub>4</sub>	13 - 40 1 - 3 3 - 9 1 - 5 0.3- 1.5
Main passiv materials*	- Steel - Plastic	33 - 74 3 - 10

\* All cell types are sealed button cells, cylindrical cells or button cell batteries, no chemical hazard will be posed as long as the cell remains in sealed condition

### 3. SAFETY GUIDELINE

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Prepared by : Dr. Ermisch

Approved by : Dr.Holl

## PRELIMINARY MATERIAL DATA SHEET

Type : Lithium Flat Prismatic Cell - LFP 7 and LFP 25  
 Chemical system : MnO<sub>2</sub> | Carbon acid ester, LiClO<sub>4</sub> | Li Date: 1999-08-04

### 1. TYPE, VOLTAGE AND WEIGHT

Cell Type	Order-No.	Voltage (V)	Weight (g)
LFP 7	6804	3.0	0,30
LFP25	6803	3,0	0,50

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Manganese dioxide	22
	- Lithium	3
	- Solution of electrolyt	11
Main passiv materials*	- Copper	37
	- Aluminium	6
	- Plastic	19

\* The cell is sealed, no chemical hazard will be posed as long as the cell remains in sealed condition.

### 3. SAFETY GUIDELINE

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Prepared by : Dr. Ermisch

Approved by : Dr. Holl

## MATERIAL DATA SHEET

Types : V15H, V40H, V80H, V65HT, V110HT, V150H, V200H, V250H, CP300H, V300H, V350H  
 Chemical system : NiOOH | KOH | MH - Rechargeable Date: 1999-03-22  
 Voltage : 1.2V

### 1. TYPE, CAPACITY AND WEIGHT

Cell Type	Typical Capacity (mAh)	Weight (g)
V15H	16	1,3
V40H	43	1,7
V80H	80	4
V65HT	70	4
V110HT	120	6
V150H	150	6
V200H	220	7
V250H	250	10
CP300H	300	11
V300H	320	12
V350H	380	13

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Nickel hydroxide - Ni(OH) <sub>2</sub> - Hydrogen storage mischmetal alloy - Potassium hydroxide - KOH	10 10 - 11 8
Passive materials*	- Steel - Metallic nickel - Plastic	40 - 50 20 - 25 3

\* All cell types are sealed button cells, no chemical hazard will be posed as long as the cell remains in sealed condition.

### 3. SAFETY GUIDELINE

- 3.1 Keep out of the reach of children. If swallowed, contact a physician at once.
- 3.2 Do not incinerate or mutilate, may burst or release toxic materials.
- 3.3 Do not short circuit, may cause burns.
- 3.4 Do not solder the battery directly.
- 3.5 Restrict charging current and time to the recommended value.
- 3.6 Observe charging temperature: 0 to +65°C.
- 3.7 Battery compartment should provide sufficient space for battery to expand in case of abuse.
- 3.8 Either battery compartment or battery connector should have a design that makes it impossible to place the battery in reverse polarity.
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4. V15H, V40H, V150H, V250H, V300H and CP300H are UL recognized components: category BBET2, file no. MH13654.

Prepared by : E Pytlik

Approved by : M Kilb

## MATERIAL DATA SHEET

Types	: V400HR, V450HR	
Chemical system	: NiMH-Rechargeable	Date: 1999-03-02
Voltage	: 1.2V	

### 1. TYPE, CAPACITY AND WEIGHT

Cell Type	Typical Capacity (mAh)	Weight (g)
V400HR	420	14
V450HR	460	14,5
V20HR	22	1,1

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Nickel hydroxide - Ni(OH) <sub>2</sub> - Hydrogen storage mischmetal alloy - Potassium hydroxide - KOH (32%)	10 10 - 11 8
Passive materials*	- Steel - Metallic nickel - Plastic	40 - 50 20 - 25 3

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Prepared by :Tobias Mai

Approved by :

## PRELIMINARY MATERIAL DATA SHEET

Types	: MC 614, MC 621	
Chemical system	: LiMnO <sub>2</sub>   organ. electrolyt   Li	Date: 1999-08-03

### 1. TYPE, VOLTAGE, AND WEIGHT

Cell Type	Order-No.	Voltage (V)	Weight (g)
MC 614	60614	3.4 - 2.0	0,18
MC 621	60621	3.4 - 2.0	0,24

### 2. INGREDIENTS

	Approx. percentage (%) of total weight						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Active materials*</td> <td style="width: 30%;"> <ul style="list-style-type: none"> <li>- Lithium manganese dioxide</li> <li>- Lithium</li> <li>- Organ. electrolyt</li> </ul> </td> <td style="width: 40%; text-align: center;"> <ul style="list-style-type: none"> <li>3 - 5</li> <li>0,2</li> <li>5 - 9</li> </ul> </td> </tr> <tr> <td>Main passiv materials*</td> <td> <ul style="list-style-type: none"> <li>- Steel and nickel</li> <li>- Plastic</li> </ul> </td> <td style="text-align: center;"> <ul style="list-style-type: none"> <li>80</li> <li>8</li> </ul> </td> </tr> </table>	Active materials*	<ul style="list-style-type: none"> <li>- Lithium manganese dioxide</li> <li>- Lithium</li> <li>- Organ. electrolyt</li> </ul>	<ul style="list-style-type: none"> <li>3 - 5</li> <li>0,2</li> <li>5 - 9</li> </ul>	Main passiv materials*	<ul style="list-style-type: none"> <li>- Steel and nickel</li> <li>- Plastic</li> </ul>	<ul style="list-style-type: none"> <li>80</li> <li>8</li> </ul>	
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Prepared by : Dr. Ermisch	Approved by : Dr. Holl
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## PRELIMINARY MATERIAL DATA SHEET

Type	: Lithium Ion Polymer Flat - Series FLP ...	
Chemical system	: MnO <sub>2</sub>   Carbon acid ester, LiClO <sub>4</sub>   Li	Date: 1999-08-04

### 1. TYPE, VOLTAGE AND WEIGHT

Cell Type	Order-No.	Voltage (V)	Weight (g)
FLP 35741-S0	66030	3.6	0,??
...	...	3,6	0,??

### 2. INGREDIENTS

		Approx. percentage (%) of total weight
Active materials*	- Manganese dioxide - MnO <sub>2</sub> - Lithium - Li metal - Solution of electrolyt (carbon acid ester with LiClO <sub>4</sub> )	22 3 11
Main passiv materials*	- Copper - Aluminium - Plastic	37 6 19

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