

UN38.3 Test Summary MC-EX-BATTERY2

The MC-EX-BATTERY2 is a CMC battery that can be forwarded alone and inside equipment. The marking of the shipment must be as follows:

- UN3480 for batteries shipped by themselves.
- UN3481 for batteries shipped inside equipment.
- For shipments with batteries by themselves and inside equipment, both markings shall be added.

Used batteries must be checked for damage and discharged to less than 30% State of Charge before it can be forwarded. Damaged batteries shall be discarded and not forwarded by any means of transportation.

Appendix 1 to this declaration is the Test Summary. The form is provided by www.lithium-battery-service.com and used to give the necessary information that is required by Sub-section 38.3 of Manual of Tests and Criteria.

Appendix 2 is the SDS given by the manufacturer of the battery cells used inside the MC-EX-BATTERY2. The two cells are connected in series.

Hell 14/1-20
(Place) (Date)

Stian Arntsen 
Stian Arntsen
Technical Manager

LITHIUM BATTERY TEST SUMMARY AND SUPPLIER INQUIRY

IN ACCORDANCE WITH SUB-SECTION 38.3
OF MANUAL OF TESTS AND CRITERIA

N/A = Not Applicable

1. Name/Description of battery	
MC-EX-BATTERY2, M9-1051-3003	

1a. Name/Description of the cells inside the battery	
2x Sanyo UF653450R 3,7V 1100mAh 4.1Wh Li-ion	

The test summary of the cells inside the battery must either be presented or under checkpoint 9 and 9a it must be confirmed that the UN 38.3 test summary for the cells is available.

2. Manufacturer of battery	
Name	HansaMatrix, AS
Address	Akmenu iela 72, LV-5001 Ogre, Latvia
Phone	+371 6504 9088
Email	info@hansamatrix.com
Website	www.hansamatrix.com

2a. Manufacturer of the equipment (if the battery is contained in equipment)	
Name	Cavotec Germany GmbH
Address	Gewerbering 3, DE-93345, Hausen, Germany
Phone	+ 49 9448 90120 0
Email	purchase.hausen@cavotec.com
Website	www.cavotec.com

3. Test laboratory of battery	
Name	Cavotec Micro-control AS
Address	Gevinglia 112, 7517 Hell, Norway
Phone	+47 74 84 31 00
Email	mc@cavotec.com
Website	www.cavotec.com

4. ID-number and date			
Unique test report identification number	TRP-3014-0003	Date of test report	07.01.2020

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Name/Description of battery (taken from field 1)
MC-EX-BATTERY2, M9-1051-3003

DESCRIPTION OF BATTERY

5. Mark the type of battery with an "●"	
<input checked="" type="radio"/> Lithium ion battery	Lithium metal battery <input type="radio"/>
<input type="radio"/> Lithium hybrid battery	

6. Parameters	
Mass in gram (g):	205
Lithium ion: Indicate watt-hour rating (Wh):	8.2
Lithium metal: Indicate lithium metal content in gram (g):	N/A
Lithium hybrid: Indicate lithium metal content in gram (g) and watt-hour rating (Wh):	N/A g
	N/A Wh

7. Physical description of battery
92x41x27mm black battery with quick snap-in/out.

8. Model numbers
MC-EX-BATTERY2, MP-05-028.

TESTS AND RESULTS

9. List of tests conducted and results - Mark N/A, pass or fail with an "●"	N/A	pass	fail
T1 - Altitude simulation	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
T2 - Thermal Test	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
T3 - Vibration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
T4 - Shock	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
T5 - External Short Circuit	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
T6 - Impact - for cylindrical cells having a diameter of at least 18 mm See check point 1a and 9a.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
T6 - Crush - for prismatic cells, pouch cells, button cells and cylindrical cells having a diameter of less than 18 mm. See check point 1a and 9a.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
T7 - Overcharge	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
T8 - Forced Discharge, only valid for cells. See check point 1a and 9a.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>



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Name/Description of battery (taken from field 1)

MC-EX-BATTERY2, M9-1051-3003

9a. UN 38.3 Test Confirmation for the Cells inside the battery

When no separate document for the cells is provided, this confirms that the cells inside the battery (see checkpoint 1.a.) have successfully passed the UN 38.3 test. In this case under checkpoint 9 the T.6 and T.8 must be marked as „passed“ and here under 9.a. „Cell UN 38.3 Test confirmed“ needs to be ticked.



Cell
UN 38.3 Test
confirmed

Cell
UN 38.3 Test
NOT
confirmed



10. Reference to assembled battery testing requirements

TP-08-006 Test procedure for MC-EX-BATTERY2 PCB.pdf
TPR-2014-0002 Maintenance and SoC for batteries on stock.pdf

N/A

11. Reference to the revised edition of the Manual of Tests and Criteria used and to amendments thereto

Sixth Revised Edition, Sub-Section 38.3.

ADDITIONAL SUPPLIER INQUIRY

12. Quality management system for manufacturing batteries

Does the manufacturer of the battery manufacture the products based on a documented quality management system according to transport regulations?



YES

NO



13. Are the following parameters exceeded?

Lithium ion battery: more than 100 Wh
Lithium metal battery: more than 2 g Lithium
Lithium hybrid Battery: more than 1,5 g Lithium and/or more than 10 Wh



YES

NO



Check point 14 – 16 need to be answered when 13 has been ticked "YES":

14. Does each battery incorporates a safety venting device or is designed to preclude a violent rupture under normal conditions of carriage?



YES

NO



15. Is each battery equipped with an effective means of preventing external short circuits?



YES

NO



16. Is each battery containing cells or series of cells connected in parallel equipped with effective means as necessary to prevent dangerous reverse current flow (e.g. diodes, fuses, etc.)?



N/A



YES

NO



17. Only in air transport: State of Charge (SoC) for UN 3480 Lithium ion batteries and lithium polymer batteries

State of Charge (SoC) max. 30 %



N/A



YES

NO




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Name/Description of battery (taken from field 1)
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BATTERIES INSTALLED IN EQUIPMENT

18. Check point 18 needs to be answered when the batteries are installed in articles:						
18.a) Only button cells enclosed?	<input type="radio"/>	YES	NO	<input checked="" type="radio"/>		
18.b) Number of enclosed batteries per equipment				max 2		
When the equipment is intentionally active/switched on during transport e.g. data loggers:						
18.c) Confirmation that no dangerous amount of heat is emitted from the equipment	<input checked="" type="radio"/>	N/A	<input type="radio"/>	YES	NO	<input type="radio"/>
18.d) Confirmation that the equipment when transported by air fulfills the defined air transport standards for electromagnetic radiation according to DO-160	<input checked="" type="radio"/>	N/A	<input type="radio"/>	YES	NO	<input type="radio"/>

19. Place, Date	20. Title, Surname, First name	21. Company stamp and signature
Hell, 2020-01-14	Technical Manager, Arntsen, Stian	 <i>Stian Arntsen</i>



Safety data sheet for chemical products (SDS)

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion battery cell
- Product code: Prismatic type cell
UF103450P, UF383543F, UF383551F, UF384461S, UF423643F, UF463048F, UF463048P, UF463443F, UF463443G, UF463446S, UF463450F, UF464459F, UF464462F, UF493850S, UF493856S, UF503436F, UF503445S, UF503861F, UF504547F, UF534042F, UF553040P, UF553048F, UF553436F, UF553436G, UF553443F, UF553443R, UF553443S, UF553443Z, UF553446Z, UF553450F, UF553450R, UF553450S, UF553450Z, UF533640S, UF564447F, UF583136R, UF603443S, UF611948P, UF613756F, UF624447F, UF633836S, UF634042F, UF653048P, UF653436S, **UF653450R**, UF653450S, UF703450F, UF752836F
- Company name: Sanyo Electric Co., Ltd. Mobile Energy Company
- Address: 222-1, Kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number: +81-799-24-4111
- Fax number: +81-799-24-4121
- Emergency telephone number: [Weekday] +81-799-23-3942
[Night and holiday] +81-799-24-4131

2. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product:

Common chemical name / General name	CAS number	Concentration / Concentration range	Classification and hazard labeling
Lithium Cobaltate (LiCoO ₂)	12190-79-3	25-40%	-
Aluminum	7429-90-5	10-40%	-
Graphite (Natural graphite) (Artificial graphite)	7782-42-5 7740-44-0	10-20%	-
Copper	7440-50-8	5-15%	Sensitization of the skin group No.2
Organic electrolyte	-	10-20%	Inflammable liquid

- UN CLASS :

Even classified as lithium ion batteries (UN3480), 2010 IATA Dangerous Goods Regulations 51st edition Packing Instruction 965 Section II is applied. The product is handled as non-dangerous goods by meeting below requirements:

- * for cells, the Watt-hour rating is not more than 20Wh

- * for batteries, the Watt-hour rating is not more than 100Wh

(the Watt-hour rating must be marked on outside of the battery case except those manufactured before 1 Jan 2009 which may be transported without this marking until 31 Dec. 2010)

- * each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria Part III subsection 38.3.

- And they are out of scope for Special Provision A154 and comply with Special Provision A164.

3. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.

Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.

- Most important hazard and effects

Human health effects:

Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.

Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.

Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

- Specific hazards:

If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

4. FIRST-AID MEASURES

Spilled internal cell materials

- Inhalation:

Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

- Skin contact:

Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

- Eye contact:

Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and spilled internal cell materials

- Ingestion:

Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention.

5. FIRE-FIGHTING MEASURE

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

- Specific hazards: Corrosive gas may be emitted during fire.

- Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.

- Special protective equipment for firefighters:

Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Protective cloth

6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

- Precautions for human body:
Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
- Environmental precautions: Do not throw out into the environment.
- Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

7. HANDLING AND STORAGE

• Handling

Technical measures:

Prevention of user exposure: Not necessary under normal use.

Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling: Do not damage or remove the external tube.

Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water or seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or fling. Never disassemble, modify or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by Sanyo.

• Storage

Technical measures:

Storage conditions (suitable, to be avoided): Avoid direct sunlight, high temperature, high humidity.

Store in cool place (temperature: -20 ~ 35 degree C, humidity: 45 ~ 85%).

Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids

Packing material (recommended, not suitable): Insulative and tear proof materials are recommended.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

• Engineering measures:

No engineering measure is necessary during normal use. In case of internal cell materials' leakage, operate the local exhaust or improve ventilation.

• Control parameters

Common chemical name / General name	ACGIH (2002)	
	TLV-TWA	BEI
Lithium Cobaltate (LiCoO ₂)	0.02mg/m ³ (as cobalt)	-
Aluminum	10mg/m ³ (metal coarse particulate) 5mg/m ³ (flammable powder) 5mg/m ³ (weld fume)	-
Carbon (Natural graphite) (Artificial graphite)	2mg/m ³ (inhalant coarse particulate)	-
Copper	0.2mg/m ³ (fume) 1.0mg/m ³ (a coarse particulate, Mist)	-
Organic electrolyte	-	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value-Time Weighted Average concentration

BEI: Biological Exposure Indices

• Personal protective equipment

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance
 - Physical state: Solid
 - Form: Prismatic
 - Color: Metallic color (without tube)
 - Odor: No odor
 - pH: NA
 - Specific temperatures/temperature ranges at which changes in physical state occur:
 - There is no useful information for the product as a mixture.
 - Flash point: NA
 - Explosion properties: NA
 - Density: NA
 - Solubility ,with indication of the solvent(s): Insoluble in water
-

10. STABILITY AND REACTIVITY

- Stability: Stable under normal use
 - Hazardous reactions occurring under specific conditions
 - Conditions to avoid: When a battery cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will be the cause of heat generation and ignition. Direct sunlight and high humidity.
 - Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
 - Hazardous decomposition products: Acrid or harmful gas is emitted during fire.
-

11. TOXICOLOGICAL INFORMATION

There is no available data on the product itself. The information of the internal cell materials is as follows.

Lithium cobaltate - LiCoO₂

- Acute toxicity: No applicable data.
 - Reference cobalt: LDLo, oral - Guinea pig 20mg/kg
- Local effects: Unknown.
- Sensitization:
 - The nervous system of respiratory organs may be stimulated sensitively.
- Chronic toxicity/Long term toxicity:
 - By the long-term inhalation of coarse particulate or vapor of cobalt, it is possible to cause the serious respiratory-organs disease. Skin reaction or a lung disease for allergic or hypersensitive person may be caused.
- Skin causticity: Although it is very rare, the rash of the skin and allergic erythema may result.

Aluminum

- Local effects: Aluminum itself has no toxicity. When it goes into a wound, dermatitis may be caused.
- Chronic toxicity/Long term toxicity: By the long-term inhalation of coarse particulate or fume, it is possible to cause lung damage (aluminum lungs).

Graphite

- Acute toxicity: Unknown.
- Local effects: When it goes into one's eyes, it stimulates one's eyes; conjunctivitis, thickening of corneal epithelium or edematous inflammation palpebra may be caused.
- Chronic toxicity/Long term toxicity:
 - Since the long-term inhalation of high levels of graphite coarse particulate may become a cause of a lung disease or a tracheal disease.
- Carcinogenicity:
 - Graphite is not recognized as a cause of cancer by research organizations and natural toxic substance research organizations of cancer.

Copper

- Acute toxicity:
 - 60-100mg sized coarse particulate causes a gastrointestinal disturbance with nausea and inflammation.

TDL_o, hypodermic - Rabbit 375mg/kg

- Local effects:
Coarse particulate stimulates a nose and a tracheal.
When it goes into one's eyes, the symptom of the reddening and the pain is caused.
- Sensitization: Sensitization of the skin may be caused by long-term or repetitive contact.
- Reproductive effects: TDL_o, oral - Rat 152mg/kg

Organic Electrolyte

- Acute toxicity:
LD₅₀, oral - Rat 2,000mg/kg or more
- Local effects: Unknown.
- Skin irritation study: Rabbit - Mild
- eye irritation study: Rabbit - Very severe

12. ECOLOGICAL INFORMATION

- Persistence/degradability:
Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Do not throw out a used battery cell. Recycle it through the recycling company.

Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

UN regulation

- ID number: 3480 (or 3481)
- Proper shipping name:
"Lithium ion batteries" (or "Lithium ion Batteries packed with equipment" or "Lithium ion Batteries contained in equipment")
- Class: 9 *
- Packing group: II *

* However this product is defined as above, it is **not** recognized as "DANGEROUS GOODS" when its transport condition accords with instructions or provisions depend on region and transportation mode. About the instructions or provisions, please see descriptions in box brackets of following regulations.

Regulation depends on region and transportation mode

- Worldwide, air transportation:
IATA-DGR ["packing instruction 965 section II" (or "packing instruction 966 section II" or "packing instruction 967 section II")
- Worldwide, sea transportation:
IMO-IMDG Code [special provision 188]
- Europe, road transportation:
ADR [special provision 188]

15. REGULATORY INFORMATION

- Regulations specifically applicable to the product:
 - Wastes Disposal and Public Cleaning Law [Japan]
 - Law for Promotion of Effective Utilization of resources [Japan]
 - US Department of Transportation 49 Code of Federal Regulations [USA]

* About overlapping regulations, please refer to Section 14-TRANSPORT INFORMATION.

16. OTHER INFORMATION

- This safety data sheet is offered an agency who handles this product to handle it safely.
- The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
- The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

Reference

Chemical substances information: Japan Advanced Information center of Safety and Health
International Chemical Safety Cards (ICSCs): International Occupational Safety and Health Information Centre (CIS)
2002 TLVs and BEIs: American Conference of Governmental Industrial Hygienists (ACGIH)
Dangerous Goods Regulations – 51st Edition Effective 1 January 2010: International Air Transport Association (IATA)
IMDG Code - 2008 Edition: International Maritime Organization (IMO)
The European Agreement concerning the International Carriage of Dangerous Goods by Road - 2009:
The United Nations Economic Commission for Europe (UNECE)
RTECS (CD-ROM)
MSDS of raw materials prepared by the manufactures

First edition: Dec. 01 2003
Prepared and approved by
Sanyo Electric Co., Ltd.
Mobile Energy Company
Battery System Development Management Department