CIS Li-Ion Battery – Altair 4 Product Family

CONTENT INFORMATION SHEET

1. Chemical Product and Company Identification

LABEL IDENTIFIER: BATTERY ASSEMBLY: Altair® 4, Altair® 4X, Altair® 4XR

COMPANY IDENTIFICATION: MSA Safety Incorporated
1000 Cranberry Woods Drive
Cranberry Township, PA 16066
CUSTOMER SERVICE: 1-800-MSA-2222 (8:30 a.m. – 5:00 p.m., USA local time)

2. Content Information

CONTENT: UN 38.3 Test Summary Report in accordance with Sub-section 38.3 of the UN Manual of Tests and Criteria, Part III, Sub-section 38.3.5.

Product Information Sheet furnished by Sony for Lithium Ion Cell used in the Altair®4, Altair®4X, and Altair®4XR.

Sony Energy Devices Corporation, Revision: – January 1, 2015

3. Disclaimer

This document is not a Safety Data Sheet as defined by 29 CFR 1910.1200. This product has been determined to be an "article" according to the OSHA Hazard Communication Standard and is thereby excluded from any requirements of the standard.

The information provided herein is considered proprietary in nature and is provided only as information that may be necessary for material handling. It may not be used or disclosed in any other manner. Use of the product may have impacted its contents; and it is the user's responsibility to dispose of the product in accordance with local, state and federal laws and regulations.

The information provided herein has been compiled from sources believed to be reliable. However, MSA Safety Incorporated makes no warranty as to the accuracy, completeness or sufficiency of the information and in no event will MSA Safety Incorporated be responsible for loss or damage of any nature whatsoever resulting from use of this information.

Revision 03/20/2019
Lithium Cell or Battery Test Summary in Accordance with Section 2.9.4 UN Model Regulations and Sub-section 38.3 of the UN Manual of Tests and Criteria, Part III, Sub-section 38.3.5.

### [a] Manufacturer
MSA Safety Incorporated

### [b] Manufacturer Contact Information
1000 Cranberry Woods Drive
Cranberry Twp., PA 16066 USA
T: 1-800-MSA-2222
www.MSAnet.com

### [c] Test Laboratory
Sony Electronics (Wuxi) Co., LTD
(Now Murata Energy Device Wuxi Co., Ltd.)
No. 27 Changjiang Road
New District, Wuxi, Jiangsu Province 214028 China
T: 86-0510-85239405
www.murata.com

### [d] Test Report ID#  
SEW-CB1267

### [e] Test Report Date  
2012.01.13

### [f] Description:  
Single small lithium ion cell, 3.7V, 1400 mAh utilized in the following MSA products: Altair® 4, Altair® 4X, Altair® 4X-R

<table>
<thead>
<tr>
<th>Lithium Ion</th>
<th>Lithium Metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass (g)</td>
<td>24.6 g</td>
</tr>
<tr>
<td>Watt-hour Rating</td>
<td>5.31</td>
</tr>
<tr>
<td>Lithium Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Model Number(s)</td>
<td>10083913 – MSA Altair® 4 Rechargeable Battery Pack</td>
</tr>
</tbody>
</table>

### [g] List of Test Conducted

<table>
<thead>
<tr>
<th>Test Conducted</th>
<th>Result (Pass / Fail / N/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38.3.4.1 T.1: Altitude simulation</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.2 T.2: Thermal test</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.3 T.3: Vibration</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.4 T.4: Shock</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.5 T.5: External short circuit</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.6 T.6: Impact/Crush (cell only)</td>
<td>Pass</td>
</tr>
<tr>
<td>38.3.4.7 T.7: Overcharge (packs only)</td>
<td>N/A</td>
</tr>
<tr>
<td>38.3.4.8 T.8: Forced discharge (cell only)</td>
<td>Pass</td>
</tr>
</tbody>
</table>

### [h] Battery Assembly:  
☒ Not Applicable  ☐ UN38.3.3 (f)  ☐ UN38.3.3 (g)

### [i] Test Reference:  

### [j] Signatory – Global Environmental Health and Safety
Date: March 14, 2019
Name: David Vogt
Title: Global Environmental Program Manager
Signature: 

[Signature]

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Notice – The above signatories affirm that this UN 38.3 Test Summary Report is an accurate and correct summary of the original tests. The original test data is confidential information available to competent Authorities with valid identification and only upon the review by MSA of a written formal request. Disclosure of original test data may be subject to the execution of a nondisclosure agreement.
1. Product and Company Identification

Product Information
- Product Category: Lithium Ion Polymer Rechargeable Battery
- Model Name: US503759
- Nominal Capacity: 1400mAh (5.2Wh)
- Rated Capacity: 1320mAh (4.9Wh)
- Average Operating Voltage: 3.70V

Company Identification
- Supplier's Name: Sony Energy Devices Corporation
- Supplier's Address: 1-1 Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, 963-0531 Japan
- Information Telephone: +81-50-3807-3065
- Date Prepared: Jan. 1, 2015
- Signature of Paper: [Signature]

2. Composition / Information on Ingredients

IMPORTANT NOTE:
The battery should not be opened or burned since the following ingredients contained within the battery that could be harmful under some circumstance if exposed or misused.

The battery contains neither metallic lithium nor lithium alloy.
- Cathode: Lithium Cobalt Oxides (active material)
  - Polyvinylidene Fluoride (binder)
  - Graphite (conductive material)
- Anode: Graphite (active material)
  - Polyvinylidene Fluoride (binder)
- Electrolyte: Organic Solvent (gel type electrolyte)
  - Lithium Salt
- Others: Heavy metals such as Mercury, Cadmium, Lead, and Chromium are not used in the battery.
- UN number: UN3480
- Watt-hour rating: 5.2Wh / 4.9Wh (Nominal / Rated)

3. Hazard Identification

Class Name: Not applicable for regulated class
Hazard: It may cause heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.
Toxicity: Vapor generated from burning batteries, may make eyes, skin and throat irritate.

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, and call a doctor. If appropriate procedures are not taken, this may cause an eye irritation.
5. Fire Fighting Measures
   • Use specified extinguishers (gas, foam, powder) and extinguishing system under the Fire Defense Law.
   • Since corrosive gas may be produced at the time of fire extinguishing, use an air inhalator when danger is predicted.
   • Use a large amount of water as a supportive measure in order to get cooling effect if needed.
   (Indoor/outdoor fire hydrant)
   • Carry away flammable materials immediately in case of fire.
   • Move batteries to a safer place immediately in case of fire.

6. Accidental Release Measures
   • Wipe off with dry cloth
   • Keep away from fire
   • Wear safety goggles, safety gloves as needed

7. Precautions for Safe Handling and Use
   Storage : Store within the recommended limit of -20°C to 45°C (-4°F to 113°F), well-ventilated area.
   Do not expose to high temperature (60°C/140°F). Since short circuit can cause burn hazard or gas release, do not store with metal jewelry, metal covered tables, or metal belt.
   Handling : Do not disassemble, remodel, or solder. Do not short + and - terminals with a metal.
   Do not open the battery.
   Charging : Charge within the limits of 0°C to 45°C (32°F to 113°F) temperature. Charge with specified charger designed for this battery.
   Discharging : Discharge within the limits of -20°C to 60°C (-4 °F to 140°F) temperature.
   Disposal : Dispose in accordance with applicable federal, state and local regulations.
   Caution : Fire, Explosion, and Severe Burn Hazard. Do not Crush, Disassemble, Heat Above 100°C/212°F, or Incinerate.

8. Exposure Controls/Personal protection (In case electrolyte is leaked from battery)
   Acceptable concentration : Not specified in ACGIH.
   Facilities : Provide appropriate ventilation such as local ventilation system in the storage.
   Protective clothing : Gas mask for organic gases, safety goggle, safety glove.

9. Physical and chemical Properties
   Appearance : Lithium Ion Polymer Rechargeable Cells.
   Average Operating Voltage : 3.70 V

10. Stability and Reactivity
    External short-circuit, deformation by crush, high temperature (over 100°C) exposure of a battery cause generation of heat and ignition.

11. Toxicological Information
    Acute toxicity : No information as a battery
    Local effects : No information as a battery

12. Ecological Information
    When exhausted battery is buried in the ground, corrosion may be caused on the outer case of battery and electrolyte may be oozed. There is no information on environmental influence.

13. Disposal considerations
    When battery is disposed, isolate positive (+) and negative (-) terminals of the battery to avoid those terminals from touching each other. Batteries may be short-circuited when piled up or mixed with the other batteries in disorder. Dispose in accordance with applicable federal, state and local regulations
14. Transport information

- When a number of batteries are transported by ship, vehicle and railroad, avoid high temperature and dew condensation.
- Avoid transportation which may cause damage of package.
- Lithium ion batteries are not subject to dangerous goods regulation for the purpose of transportation by the International Maritime Dangerous Goods regulations (IMDG). For Lithium ion batteries, the Watt-hour rating is no more than 20Wh/cell and 100Wh/battery pack can be treated as “non-dangerous goods” by the United Nations Recommendations on the Transport of Dangerous Goods/Special Provision 188, provided that the products are prevented from being short-circuited with each other and are packaged in an appropriate condition which satisfies Packing Group II performance level.
- IATA (International Air Transport Association): Dangerous Goods Regulation Packing Instruction 965 (Lithium ion or lithium polymer cells and batteries without electronic equipment)

Section II requirements apply to lithium ion cells with a Watt-hour rating not exceeding 20Wh and lithium ion batteries with a Watt-hour rating not exceeding 100Wh packed in quantities that within the allowance permitted in Section II, Table 965-II.

<table>
<thead>
<tr>
<th>Contents</th>
<th>Lithium ion cells and/or batteries with a Watt-hour rating of 2.7Wh or less</th>
<th>Lithium ion cells with a Watt-hour rating of more than 2.7Wh but not more than 20Wh</th>
<th>Lithium ion batteries with a Watt-hour rating of more than 2.7Wh but not more than 100Wh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum number of cells/batteries per package</td>
<td>No limit</td>
<td>8 cells</td>
<td>2 Batteries</td>
</tr>
<tr>
<td>Maximum net quantity per package</td>
<td>2.5 kg</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Lithium ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:
- Each cell and 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;
- Cells and batteries must be manufactured under a quality management program;
- For batteries, the Watt-hour rating must be marked on the outside of the battery case;
- Each package must be capable of withstanding a 1.2m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labeled with a lithium battery handling label.

Section IB requirements apply to lithium ion cells with a Watt-hour rating not exceeding 20Wh and lithium ion batteries with a Watt-hour rating not exceeding 100Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II. Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II must be assigned to Class 9 and are subject to all of the applicable provisions of Regulation.

Even classified as lithium batteries packed with equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 966 is applied. Even classified as lithium batteries installed in equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 967 is applied.

15. Regulatory information

16. Other Information

The information contained within is provided for your information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. However, Sony Energy Devices Corporation MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON IT.