SAFETY DATASHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Important Note: As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use. The information contained in this Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Commercial product name
Q SAVE-G 2.6 3.3KWh Bl 1.1 or
Q SAVE-G 2.4 0.4KWh Bl 1.1

Use of the substance / preparation
Lithium-ion batteries

Synonyms
Lithium-ion Cell, Lithium-ion Battery, Li-Ion Cell, Li-Ion Battery

Manufacturer
Hanwha Solutions Corporation
23F 24F, 86, Cheonggyecheon-ro, Jung-gu, Seoul 04541, Korea

Supplier
Hanwha Q CELLS Australia Pty Ltd
Suite 1, Level 1, 15 Blue Street, North Sydney, NSW 2060, Australia
Tel: +61 (2) 9016 3033

Emergency Contact
Poisons Information Line: 13 11 26 (24 hours a day, 7 days a week in Australia)
In the case of an emergency, dial 000 immediately

Further Information
Battery System: Lithium-ion (Li-ion)
Nominal Voltage: 202.7 VDC
Rated Capacity: 31.095 Ah or 19.628 Ah
kWh rating: 6.3 kWh or 4.0 kWh
Anode (negative electrode): based on intercalation graphite
Cathode (positive electrode): based on lithiated metal oxide (Cobalt, Nickel, Manganese)

Remark:
The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Co., Ltd & Hanwha Q CELLS Australia Pty Ltd. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture
Preparation Hazards and Classification: Pursuant to Australian Work Health and Safety Regulations, the product is a Lithium ion cell or battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery interconnections are only applicable if exposure has occurred to components when a cell or battery is compromised and starts to leak, is exposed to high temperatures or is mechanically, electrically or physically abused / damaged. If the cell or battery is ruptured, the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact. Exposure occurs only if the cell or pack is mechanically, thermally, electrically or physically abused / damaged to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact.

Potential Health Effect(s):
Acute (short term): see Section 8 for exposure controls.
In the event that this cell or pack has been ruptured, the electrolyte solution contained within the cell would be corrosive and can cause burns to skin and eyes.
Ingestion: Swallowing of materials from a sealed cell is not an expected route of exposure. Vapors or mists from a ruptured cell may cause respiratory irritation.

Skin: Contact between the cell and skin will not cause any harm. Skin contact with the contents of an open cell can cause severe irritation or burns to the skin.
Chronic (long term): see Section 11 for additional toxicological data.

Interactions with other chemicals: Immersion in high conductivity liquids may cause corrosion and breach of the cell or battery enclosure. The electrolyte solution inside of the cells may react with alkaline (basic) materials and present a flammability hazard.

Potential Environmental Effects: Not Available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS. No.</th>
<th>% Mass range in cell (g / g %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolyte salt</td>
<td>21324-40-3</td>
<td>0.95-5</td>
</tr>
<tr>
<td>Electrolyte solvent</td>
<td>96-49-1</td>
<td>3-15</td>
</tr>
<tr>
<td>PVDF Polyvinylidene fluoride</td>
<td>24937-79-9</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-56-8</td>
<td>3-15</td>
</tr>
<tr>
<td>Aluminium</td>
<td>7429-99-5</td>
<td>2-10</td>
</tr>
<tr>
<td>Cathode Lithium Nickel oxide</td>
<td>1313-9-9</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Lithium cobalt oxide</td>
<td>1307-96-6</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Lithium Manganese oxide</td>
<td>1313-13-9</td>
<td>&lt;30</td>
</tr>
<tr>
<td>Anode Graphite</td>
<td>7782-42-5</td>
<td>10-30</td>
</tr>
<tr>
<td>Steel, Nickel, and inert components</td>
<td>Various Balance</td>
<td></td>
</tr>
</tbody>
</table>

Because of the cell structure the dangerous ingredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.

4. FIRST AID MEASURES

Description of first aid measures

The hazardous components of this cell or battery are contained within a sealed unit. The following are only applicable if exposure has occurred to components when a cell or battery leaks, is exposed to high temperatures or is mechanically, electrically or physically abused / damaged.
maged. The hazardous contents are caustic alkali electrolytes contained in cells with lithium metal oxide cathodes, graphite and carbon anodes and Polyvinylidenfluoride binders. Ingestion: Have victim rinse mouth thoroughly with water. Do NOT INDUCE VOMITING. Quickly transport victim to an emergency care facility. Eye: If eye contact with contents of an open cell occurs, immediately flush the contaminated eye(s) with water. Quickly transport victim to an emergency care facility. Skin Contact: Immediately flush with water. If irritation or pain persists, seek medical attention. Inhalation: Remove the patient from exposure into fresh air, seek medical attention. Protection for first Aiders Aiders: Do not enter corrosive vapor contaminated areas without a respirator or Self Contained Breathing Apparatus. Wear adequate personal protective equipment as indicated in Section 8. First Aid Facilities: Eye wash bottle, fountain, safety showers or at least a source of running water are required in the area where the product is used. Most important symptoms & effects, acute & delayed, caused by exposure: Acute: The contents of the battery are rated as corrosive. Ingestion of the electrolyte could lead to severe gastrointestinal tract irritation with nausea, vomiting and potentially burns. Inhalation of vapors may lead to severe irritation of the mouth and upper respiratory tract with burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing. Eye contact may lead to severe eye irritation or in worst case scenario irreversible damage and possible eye burns. Skin contact may lead to irritation and possible skin burns. Chronic: Skin contact may aggravate/exacerbate existing skin conditions, such as dermatitis. Chronic irritation may lead to the same symptoms as listed for acute irritation above. Indication of any immediate medical attention and special treatment needed Advice to Doctor: Treat symptomatically if the person comes into contact with the corrosive electrolyte liquid contents of a damaged battery. 5. FIRE FIGHTING MEASURES Suitable extinguishing media Cold water and dry powder in large amount are applicable. Use metal fire extinction powder or dry sand if only few cells are involved. Special hazards arising from the chemical May form hydrofluoric acid if electrolyte comes into contact with water. In case of fire, the formation of the following flue gases cannot be excluded: Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide. Protective equipment and precautions for firefighters Wear self-contained breathing apparatus and protective suit. Additional information If possible, remove cell(s) from fire fighting area. If heated above 125 °C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated. 6. ACCIDENTAL RELEASE MEASURES Personal precautions, protective equipment and emergency procedures: As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed areas before entering. Wear adequate personal protective equipment as indicated in Section 8. Environmental precautions Absorb spilled material with non-reactive absorbent such as vermiculite, clay or earth. Prevent from migration into soil, sewers and natural waterways – inform local authorities if this occurs. Methods and material for containment and cleaning up Evacuate spill area immediately and remove sources of ignition. Do NOT touch spilled material. Cleanup personnel must be trained in the safe handling of this product. Spills may be absorbed on non-reactive absorbents such as vermiculite. Place cells or batteries into individual plastic bags and then place into appropriate containers and close tightly for disposal. Ensure that cleanup procedures do not expose spilled material to any moisture. Immediately transport closed containers outside. Lined steel drums are suitable for storage of damaged cells or batteries until proper disposal can be arranged. 7. HANDLING AND STORAGE Precaution for Handling Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble. Advice on protection against fire and explosion Keep away from open flames, hot surfaces and sources of ignition. Condition for storage Storage at room temperature (approx. 20 °C) at approx. 20~60 % of the nominal capacity (OCV approx. 3.6~3.9 V/cell). Keep in closed original container. 8. EXPOSURE CONTROLS/PERSONAL PROTECTION EXPOSURE LIMIT VA LUES EXPOSURE LIMITS Exposure Control Measures Exposure Limit Values: Airborne exposures to hazardous substances are not expected when the cells or batteries are used for their intended purposes. Exposure standards are not applicable to the sealed articles. Biological Monitoring: Not applicable. Control Banding: Not applicable. Recommended monitoring procedures: Follow standard monitoring procedures. Derived no-effect level (DNEL): Not applicable. Derived minimal effect level (OMEL): Not applicable. Predicted no-effect concentrations (PNECs): Not applicable. Engineering Controls Engineering Controls: Special ventilation is not required when using these products in normal use scenarios. Ventilation is required if there is leakage from the cell or battery. Individual Protection Measures Eye and Face protection: Eye protection is not required when handling cells or batteries during normal use. Wear safety glasses / goggles if handling a leaking or ruptured cell or battery. Skin (Hand) protection: Hand protection is not required when handling the cell or battery during normal use. PVC gloves are recommended when dealing with a leaking or ruptured cell or battery. Skin (clothing) protection: Skin protection is not required when handling the cell or battery during normal use. Wear long sleeved clothing to avoid skin contact if handling a leaking or ruptured cell or battery. Soiled clothing should be washed with detergent prior to re-use. Respiratory protection: During routine operation, a respirator is not required. However, if dea ling with an electrolyte leakage and irritating vapors are generated, an approved half face inorganic vapor / gas / particulate respirator is required. Thermal Protection: Not applicable. Other Protective Equipment: Have a safety shower or eye wash station readily available. Hygiene Measures Do not eat, drink or smoke in work areas. Avoid storing food, drink or tobacco near the product. Practice and maintain good housekeeping. Environmental exposure controls: Avoid release to the environment. 9. PHYSICAL AND CHEMICAL PROPERTIES Appearance Physical state: Solid Color: Various Odor: Odorless Important health, safety and environmental information Test method pH Value: n.a. Flash point: n.a. Lower explosion limits: n.a. Vapour pressure: n.a. Density: n.a. Water solubility: Insoluble Ignition temperature: n.a. 10. STABILITY AND REACTIVITY Stability Stable Conditions to avoid Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate. Materials to avoid No materials to be especially mentioned. Hazardous decomposition products In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release. Possibility of Hazardous Reactions Will not occur Additional information No decomposition if stored and applied as directed. 11. TOXICOLOGICAL INFORMATION Information on toxicological effects: The hazardous components of the cell or battery are contained within a sealed unit. Under re-commended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery integrity remains and the seals remain intact. The potential for exposure should not exist unless the battery leaks, is exposed to high temperature or is mechanically, electrically or physically abused / damaged. The following toxicology data is in respect to if a person comes into contact with the electrolyte. Acute Toxicity: Swallowed: The electrolyte contained within the cell or battery is a corrosive liquid. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns to the gastrointestinal tract. During normal usage ingestion should not be a means of exposure. Eye: The electrolyte contained within the cell or battery is a corrosive liquid and it is expected that it would cause irreversible damage to the eyes. Contact may cause corneal burns. Effects may be slow to heal after eye contact. Correct handling procedures incorporating appropriate eye protection should minimize the risk of eye irritation. Skin: The electrolyte contained within the cell or battery is a corrosive liquid and it is expected that it would cause skin burns or severe irritation to the skin if not washed off immediately. Correct handling procedures should minimize the risk of skin irritation. People with pre-existing skin conditions, such as dermatitis, should take extreme care so as not to exacerbate the condition. Inhaled: Inhalation of vapors from a leaking cell or battery is expected to cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing. Skin Corrosion / Irritation: The electrolyte contained within the cell or battery is classified as a corrosive liquid and is expected to exhibit Dermal Corrosivity / Irritation.
15. REGULATORY INFORMATION

Canadian Federal Regulations:
These products have been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification: Not Controlled, manufactured article.

New Substance Notification Regulations: Lithium metaborophosphate is listed on the Non-Domestic Substance List (NDSL). All other ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL).

National Pollutant Release Inventory (NPRI) Substances: These products do not contain any NPRI chemicals.

United States Federal and State Regulations:

TSCA Status: All ingredients in these products are listed on the TSCA inventory.

OSHAA: These products do not meet criteria as per Part 1910.1200, manufactured article.

SARA EPA Title III: None.
Sec. 302 / 304: None.
Sec. 311 / 312: None.
Sec. 313: None.
CERCLA RQ: None.

Australia and New Zealand:

SUSMP: Not applicable.
AICS: All ingredients are on the AICS list.
HSNO Approval number: Not applicable
HSNO Group Title: Not applicable
NOHSC: 10008 Risk Phrases: R34 - Causes Burns.

Other EU Regulations

These products are not classified as hazardous according to Regulation (EC) No. 1272/2008. Keep out of reach of children.

EU Restrictions on use:
Regulation (EC) No. 1907 / 2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended: Aluminium (CAS 7429-90-5)

Japanese Regulations

Japanese Industrial Standards (JIS) JIS Z 7253:2012 Waste disposal and public cleaning law

Law for Promotion of Effective Utilization of Resources

Taiwanese Regulations

Regulation of Labeling and Hazard Communication of Chemicals in compliance with the GHS standard for chemical product sites and labeling of consumer goods. General Rule for Preparation of Precautionary Labels for Chemicals (GB 15258-2009): Specifies the relevant application methods of precautionary labels for chemicals. Safety Data Sheet for Chemical Products Content and Order of Sections (GB / T 16483-2008)

Chinese Regulations


16. OTHER INFORMATION

Further Information

Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product(s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. "n. a. = not applicable; n. d. = not determined" The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor’s safety data sheet.