

MATERIAL SAFETY DATA SHEET

Super pulse battery capacitor (SPC)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Super pulse battery capacitor (SPC). Product designation can include additional letter, such as SPC-1550, SPC-1530, SPC-1520, and SPC-0920 which, can include one or more lines and letters and digits to indicate different finishing.

MODEL

	DIAMETRE	HEIGHT	CAPACITY
SPC0920	9.0mm	21mm	49F
SPC1520	15.1mm	21mm	147F
SPC1530	15.1mm	29mm	229F
SPC1550	15.1mm	51mm	524F

MANUFACTURER

EVE Energy Co., Ltd

CHEMICAL SYSTEM

Based on Lithium Ion

ADDRESS

EVE Industrial Park, Xikeng Industrial
Zone, Huihuan Town, Huizhou,
Guangdong, China

EMERGENCY TELEPHONE NUMBER

(752) 2606966 (China)
86(752) 2606966 (International)

2. COMPOSITION INFORMATION

HAZARDOUS INGREDIENTS	Formula	%	CAS NUMBER
Lithium Cobalt Nickel Manganese Oxide	LiMn_xO_y , LiCoO_2 , $\text{LiNi}_x\text{Co}_{1-x}\text{O}_2$	10-20	
Graphite and Carbons	C, C6	10-20	7782-42-5/1333-86-4
Ethylene carbonate	$\text{C}_4\text{H}_6\text{O}_3$	3-12	96-49-1
Dimethyl carbonate	$\text{C}_3\text{H}_6\text{O}_3$	3-12	616-38-6
Diethyl Carbonate	$\text{C}_5\text{H}_{10}\text{O}_3$	3-12	105-58-8
Lithium Hexafluoro Phosphate	LiPF_6	1-2	21324-40-3
Polyvinylidene Fluoride(PVDF)	$-(\text{C}_2\text{H}_2\text{F}_2)_n-$	1	24937-79-9
Copper	Cu	7-15	7440-50-8
Aluminum	Al	5-10	7429-50-5
Steel, nickel and inert components	N/A	Balance	N/A

3. HAZARDS IDENTIFICATION

The capacitors described in this MSDS is hermetically sealed unit, which are not hazardous when used according to the recommendations of the manufacturer and provide that the integrity the capacitors is maintained.

- Health Hazards (Acute and Chronic)

These chemicals are contained in a sealed Al foil. Risk of exposure occurs only if the SPC is mechanically or electrically abused. Contact of electrolyte with skin and eyes should be avoided.

- Sign/Symptoms of Exposure

A shorted SPC can cause thermal and chemical burns upon contact with the skin. Maybe a reproductive hazard.

4. FIRST AID MEASURES

EYE

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

SKIN

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

INHALATION

Remove from exposure and move to fresh air immediately. Use oxygen if available.

INGESTION

Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

5. FIRE FIGHTING MEASURES

FLASH POINT

N/A

EXTINGUISHING MEDIA

Dry chemical type extinguishers, or CO₂ extinguishers or water extinguishers and dry sand can be used effectively for burning capacitors. Water-based foam or copious quantities of water can be used to cool down burning SPC.

SPECIAL FIRE-FIGHTING INSTRUCTIONS

Wear the self-contained breathing apparatus (SCBA) to avoid breathing of irritant fumes. Wear protective clothing and equipment to prevent body contact with electrolyte solution. The Lithium metal in capacitors reacts with water and generates Hydrogen gas. Since vapor, generated from burning capacitors may make eyes, nose and throat irritates, be sure to extinguish the fire on the windward side. DO NOT re-enter the area until it has been thoroughly ventilated (purged) of fire vapors and from extinguishing agent.

UNUSUAL FIRE AND EXPLOSION HAZARDS

SPC may explode or leak potentially hazardous vapors when subject to: excessive heat (above 150°C), fire, recharged, over-discharged (discharge below 0V), punctured and crushed. Burning SPC emit acrid smoke, irritating fumes, and toxic fumes of hazardous oxides of carbons, hydrofluoric acid and other toxic by-products.

Damaged or opened capacitors can result in rapid heating and release of flammable vapors.

HAZARDOUS COMBUSTION PRODUCTS

Carbon monoxide, carbon dioxide, lithium oxide fumes and other toxic by-products (e.g., lithium oxide, aluminum, aluminum oxide, cobalt oxide, nickel oxide, copper, copper oxide, phosphorus pentafluoride, etc.).

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken in case Material is Released or Spilled

In the case of electrolyte leakage from a SPC, the leaked materials should be removed using protective glass and protective gloves. Do not inhale the gas as much as possible. In addition, avoid touching the material as much as possible. Remove personnel from area until fumes dissipate. Avoid skin and eye contact or inhalation of vapors. If skin has come into contact with the electrolyte, it should be washed thoroughly with water.

Damaged capacitors that are not hot or burning should be placed in a sealed plastic bag or container, adding some chalk (CaCO_3) or lime (CaO) powder or Vermiculite. The removal of the capacitors should be dealt carefully using protective glasses and protective gloves.

Waste Disposal Method

It is recommended to discharge the SPC to the end, handing in the abandoned capacitors to related department unified, dispose of the capacitors in accordance with approved local, state, and federal requirements. Consult state environmental protection agency and/or federal EPA.

7. HANDLING AND STORAGE

The SPC should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit, over charge, puncture, incinerate, crush, immerse in water, force discharge, or expose to temperatures above the temperature range of the SPC. Do not crush or puncture the SPC, or immerse in liquids. Risk of fire and explosion.

Precautions to be taken in Handling and Storing

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided.

Do not place the SPC near heating equipment, nor expose to direct sunlight for long periods.

Other Precautions

The SPC may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures.

Do not short or install with incorrect polarity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION

In case of SPC venting, provide as much ventilation as possible. Avoid confined areas with venting SPC cores. None necessary under normal use. In case electrolyte leakage from capacitors, protect hand with chemical resistant rubber gloves. If capacitors are burning, leave the area immediately. In all fire situations, use contained breathing apparatus.

VENTILATION

Not necessary under conditions of normal use. In case of abuse, use adequate mechanical ventilation (local exhaust) for SPC that vent gas or fumes.

PROTECTIVE GLOVES

Not necessary under conditions of normal use. In case of spill, use chemical resistant rubber gloves.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

Not necessary under conditions of normal use.

Personal Protection is recommended for venting SPC: Respiratory protection, Protective gloves, protective clothing and safety glass with side shields.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Appearance:	Cylindrical Solid Object
Odor:	No odor. If leaking, gives off organic odor
pH:	Not applicable, unless individual SPC or internal components is exposed to water.
Vapor pressure:	not applicable
Vapor density:	not applicable
Boiling point:	not applicable
Flammability:	not applicable
Melting and boiling points:	not applicable
melting boiling ranges:	not applicable
Ignition temperature:	not applicable
% Volatiles:	not applicable
Flash point:	not applicable
Density(gr/cc)	> 1.5gr/cc
Solubility in water and other solvents	not applicable, unless internal components exposed
explosion properties	not applicable

10. STABILITY AND REACTIVITY

STABILITY

The SPC is stable under normal use and storage as described in Section 7.

CONDITIONS TO AVOID

Mechanical abuse such as crushing, piercing, and disassembly.

Electrical abuse such as short-circuiting, charging, over-discharge, (voltage reversal).

Heating above 85°C, exposure to open flame and incineration.

HAZARDOUS DECOMPOSITION PRODUCTS

None during normal operating conditions. If SPC opens:

1. Thermal decomposition during fire produces hazardous oxides of carbon (mainly CO and other VOC's) and phosphorous, hydrofluoric acid and other toxic byproducts.
2. Metallic compounds such as oxides of nickel, cobalt and copper.
3. Electrolyte with water: Hydrofluoric acid (HF).

HAZARDOUS POLYMERIZATION

N/A

11. TOXICOLOGICAL INFORMATION

None, unless SPC ruptures. Inhalation, skin contact and eye contact are possible when the SPC is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

12. ECOLOGICAL INFORMATION

When properly used and disposed, the SPC does not present environmental hazard. Some materials within the capacitors are bioaccumulative, so do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Do not incinerate, or subject capacitors to temperatures in excess of 150 °C. Such abuse can result in loss of seal, leakage, and/or SPC explosion. Dispose of in accordance with appropriate local regulations.

14. TRANSPORT INFORMATION

According to PACKING INSTRUCTION PI965II ~ PI967II of IATA DGR 61st Edition for transportation, or the special provision 188 of IMDG. More information concerning shipping, testing, marking and packaging can be obtained from Label master at <http://www.labelmaster.com>.

The products meet all the requirements of the IATA DGR 61th edition, under special provisions A164 including UN 38.3 test and 1.2m drop test. They can be shipped as "Not Restricted" cargo in accordance with IATA Dangerous Good Regulations Section II of Packing Instruction 967 of IATA DGR item UN3481.

Separate battery when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

Transport Fashion: By air, by sea.

Packaging Information: Packaging paper+ Plastic tray.

15. REGULATORY INFORMATION

LAW INFORMATION

- «Dangerous Goods Regulation»
- «Recommendations on the Transport of Dangerous Goods Model Regulations»
- «International Maritime Dangerous Goods»
- «Technical Instructions for the Safe Transport of Dangerous Goods»
- «Classification and code of dangerous goods»
- «Occupational Safety and Health Act» (OSHA)
- «Toxic Substances Control Act» (TSCA)
- «Consumer Product Safety Act» (CPSA)

«Federal Environmental Pollution Control Act» (FEPCA)
«The Oil Pollution Act» (OPA)
«Superfund Amendments and Reauthorization Act Title III (302/311/312/313)»
(SARA) «Resource Conservation and Recovery Act» (RCRA)
«Safety Drinking Water Act» (CWA)
«California Proposition 65»
«Code of Federal Regulations» (CFR)

In accordance with all Federal, State and Local laws.

16. ADDITIONAL INFORMATION

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.