ILLINOIS CAPACITOR, INC.

Material Safety Data Sheet (MSDS)
Super Capacitors

Supplier information

Supplier: Illinois Capacitor, Inc.	
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Product Identification

Product type	Supercapacitor, Ultracapacitor, Electric Double Layer Capacitor (EDLC)
Product	Commercial

Composition

Supercapacitors are composed of plastic tubing around aluminum cans with a rubber end seal. Internally supercapacitors consist of aluminum foils with activated carbon deposited on the foil surface. The foils are separated by a paper soaked with an electrolyte consisting of tetraethyl ammonium tetra fluoroborate dissolved in Acetonitrile.

Under normal use exposure of the internal components is not expected. If this product is heated or opened the activated carbon and electrolyte can be released. Precautions should be taken to prevent rupturing or overheating supercapacitors.

Material Name	Proportion in weight	Material component	CAS No.	Material Proportion	Hazardous substance
Anode foil	15.40	Al	1333-86-4	35.60	None
		Fe	7429-90-5	0.10	
		Si	7439-89-6	0.10	
		Cu	7440-21-3	0.20	
		C	7440-50-8	64.00	
Cathode foil	13.15	Al	1333-86-4	35.60	None
		Fe	7429-90-5	0.10	
		Si	7439-89-6	0.10	
		Cu	7440-21-3	0.20	
		C	7440-50-8	64.00	
Separator	9.99	Cellulose	9004-34-6	100.00	None
Lead wire	8.40	Al	7429-90-5	52.08	None
		Fe	7439-89-6	34.74	
		Cu	7440-50-8	9.10	
		Bi	7440-69-9	0.72	

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		Sn	7440-31-5	3.35	
Rubber	14.15	BUTYL/EPDM	9010-85-9	35.00	None
		C	1333-86-4	18.00	
		$CaCO_3$	1332-58-7	38.00	
		SiO_2	14808-60-7	7.00	
		ZnO	1314-13-2	2.00	
Al case	18.40	Al	7429-90-5	99.84	None
		Fe	7439-89-6	0.12	
		Si	7440-21-3	0.04	
Electrolyte	16.51	C8H20BF4N (tetraethyl ammonium tetra fluoroborate)	429-06-1	35.00	None
		C2H3N (Acetonitrile)	75-05-8	65.00	
Sleeve	3.92	PET	29154-49-2	85.00	None
		Stabilizer	15546-11-9	14.00	
		Pigment	1333-86-4	1.00	
Printing Ink	0.8	Cyclohexanone	108-94-1	70.00	None
		Methyl Ethyl Ketone	78-93-3	20.00	
		Toluene	108-88-3	5.00	
		Pigment		5.00	

Physical and chemical properties

Flash Point	Not applicable
Auto-ignition	Not applicable
Explosion sensitivity	Not sensitive
Flammable limits	Not applicable

Fire fighting measures

First aid responders should not attempt retrieving victims of exposure without adequate personal protective equipment. Only trained personal should administer supplemental oxygen or CPR when necessary.

Extinguishing media	1. Dry chemical powder 2. Alcohol resistant foam 3. Carbon dioxide 4. Halon 5. Any “ABC” class medium.
Specific extinguishing procedure	1. Water based extinguishers could be used for fires for cooling purposes only. 2. Eye protection. 3. Full protective clothing and self contained breathing apparatus

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Health hazard and first aid measures

First aid measures for exposure to the electrolyte solution:

Toxicological	No health hazard is anticipated during normal use of this product. In the event the container is ruptured the electrolyte can be released. See first aid measures for treatment if exposure occurs. This product is not a known carcinogen.
Health hazard:	Eye contact: May cause mild irritation. Skin contact: May cause skin irritation. Inhalation: Sign and symptoms of excessive exposure may feel headache or sick.
First aid measures: .	Eyes: Flush with large amount of water. If irritation persists, seek medical attention.
	Skin: Rinse with water. If persistent irritation occurs, seek medical attention.
	Inhalation: Inhalation is not considered a problem. If any breathing difficulties are noticed, remove to fresh air and seek medical attention if needed.
	Ingestion: Do not induce vomiting. Get medical help.
	Electrical shock: Victim should not be touched if electrical connection to the capacitor is present. Once disconnected victim can be touched. If shock has resulted in cessation of breathing begin mouth to mouth resuscitation. If the heart has stopped start CPR. Immediate medical attention is to be sought while revival of the victim is occurring.

Accidental release measures

Personal Protection	Do not eat, drink, smoke or apply cosmetics while handling this product. Wash hands after handling this product. Avoid breathing gases generated by this product. Use in a well ventilated area.
Personal precautions	Remove ignition sources, no smoking. Avoid sparks. Evacuate the area of all non-essential personnel. Shut off leaks, without personal risk when possible.
Environmental Precautions	Prevent contamination of soil and water. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth or other appropriate barriers.
Cleanup and containment	No special accidental release measures are required. If use or misuse of the supercapacitor should occur and the electrolyte is spilled only trained personal using preplanned procedures should clean up the electrolyte. Before cleanup is initiated all sources of ignition should be

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	eliminated. Absorb the electrolyte with non-reactive absorbent materials. Place all spill residue materials in an appropriate container and seal. Decontaminate spill area thoroughly. Dispose of spill materials per the appropriate regulations.

Handling and storage

Handling	Remove all ignition sources. Avoid sparks. Do not smoke. Do not empty into drains.
Storage	Keep away from direct sunlight and other sources of heat or ignition. Keep container tightly closed and in a well-ventilated place. When stacking supercapacitors place a layer of cardboard between layers to prevent damage.

Disposal

Supercapacitors do not exhibit any hazardous waste characteristics but supercapacitors contain materials in the electrolyte that can be of environmental concern if not disposed of properly. Supercapacitors should be disposed at facilities that accept industrial waste. State and local regulations may be more restrictive than federal regulations. Checking for local and state regulations is recommended.

Ecological toxicity

The aluminum can and plastic sleeve will remain in the environment for an extended period of time.
The following information is for Acetrinitrile in the electrolyte.

Air	If the supercapacitor in opened the Acetrinitrile in the electrolyte will be exposed to the environment. Acetrinitrile exists as a vapor at standard atmospheric conditions. Acetrinitrile is listed as a Hazardous Air Pollutant (HAP) by the U.S. Clean Air Act.
Soil	Microbial degradation will remove Acetrinitrile from soil. Evaporation and leaching will help remove Acetrinitrile from soil.
Water	Biodegradation will remove Acetrinitrile from water. Acetrinitrile is a toxic pollutant per section 307(a)(1) of the U.S. Water Pollution Control Act.

Transportation information

This product is not classified as dangerous goods per U.S. DOT, Canadian, international air and maritime regulations.

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