Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
ELECTRIC DOUBLE LAYER CAPACITOR

Synonyms
ULTRACAPACITOR; SUPERCAPACITOR

Product Description
This product is considered an article; therefore, there are no significant adverse effects when used as directed. The information in this SDS is provided for situations where this article may be deformed, creating dusts or fumes which may be potentially hazardous.

Product Use
Energy storage device that is positioned between conventional electrolytic capacitor and rechargeable batteries. Similar use with secondary cell.

Restrictions on Use
None known.

Details of the supplier of the safety data sheet

ENERGYFLO US

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Combustible Dust
Acute Toxicity - Oral - Category 4
Acute Toxicity - Dermal - Category 3
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Eye Irritation - Category 1
Germ Cell Mutagenicity - Category 2
Carcinogenicity - Category 1A
Specific target organ toxicity - Single exposure - Category 1 (central nervous system , respiratory system)
Specific target organ toxicity - Repeated exposure - Category 1 (lungs , skeletal system)
Specific target organ toxicity - Repeated exposure - Category 2 (central nervous system , circulatory system , kidneys , liver , respiratory system)
Hazardous to the Aquatic Environment - Acute - Category 3
Hazardous to the Aquatic Environment - Chronic - Category 4

GHS Label Elements

Symbol(s)

Signal Word
Danger

Hazard Statement(s)

May form combustible dust concentrations in air (during handling or processing).
Toxic in contact with skin.
Harmful if swallowed.
Causes skin irritation.
Causes serious eye damage.
Suspected of causing genetic defects.
May cause cancer.
Causes damage to organs. (central nervous system , respiratory system)
Causes damage to organs through prolonged or repeated exposure. (lungs , skeletal system)
May cause damage to organs through prolonged or repeated exposure. (central nervous system , circulatory system , kidneys , liver , respiratory system)

Precautionary Statement(s)

Prevention
Do not breathe dust.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.

Response
IF exposed or concerned.
Get medical advice/attention.
IF ON SKIN.
Wash with plenty of water.
Call a POISON CENTER or doctor/physician if you feel unwell.
If skin irritation occurs.
Get medical advice/attention.
Take off immediately all contaminated clothing.
Wash contaminated clothing before reuse.
IF IN EYES.
Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do.
Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED.
Call a POISON CENTER or doctor/physician if you feel unwell.
Rinse mouth.

Storage
Store locked up.

Disposal
Dispose in accordance with all applicable regulations.

Statement of Unknown Toxicity
0% of the mixture consists of ingredient(s) of unknown acute toxicity.

Other Hazards
None known.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
7429-90-5	Aluminum	30-45
75-05-8	Acetonitrile	25-30
7440-44-0	Carbon, activated	15-25
429-06-1	Tetraethylammonium tetrafluoroborate	<15
9004-34-6	Cellulose	<5

Section 4 - FIRST AID MEASURES

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eyes
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion
If swallowed, get medical attention. Rinse mouth.

Most Important Symptoms/Effects

Acute
Toxic in contact with skin, Harmful if swallowed, skin irritation, eye burns, central nervous system damage, respiratory system damage

Delayed
mutagenic effects, cancer, lung damage, bone damage, central nervous system damage, circulatory system damage, kidney damage, liver damage, respiratory system damage

Antidote
Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
Use extinguishing agents appropriate for surrounding fire.

Unsuitable Extinguishing Media
None known.

Special Hazards Arising from the Chemical
Negligible fire hazard. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products
Cyanides, Hydrogen fluoride, oxides of aluminum, oxides of boron, Oxides of carbon, oxides of nitrogen

Fire Fighting Measures
Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Special Protective Equipment and Precautions for Firefighters
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8. Avoid release to the environment.

Methods and Materials for Containment and Cleaning Up
Keep unnecessary people away, isolate hazard area and deny entry. If sweeping of a contaminated area is necessary, use a dust suppressant agent. Collect spill using a vacuum cleaner with a HEPA filter or wet and scoop up dry spills. Avoid sweeping spilled dry material. Eliminate ignition sources including sources of electrical, static or frictional sparks. Collect spilled material in appropriate container for disposal.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Do not breathe dust. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Use methods to minimize dust.

Conditions for Safe Storage, Including any Incompatibilities
Store locked up.
Store and handle in accordance with all current regulations and standards. Store locked up. See original container for storage recommendations. Keep separated from incompatible substances.

Incompatible Materials
Acids bases combustible materials halocarbons halogens metal carbide metal oxides metal salts metals oxidizing materials peroxides reducing agents

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Aluminum	**7429-90-5**
ACGIH:	1 mg/m3 TWA respirable particulate matter
NIOSH:	10 mg/m3 TWA total dust ; 5 mg/m3 TWA respirable dust
OSHA (US):	15 mg/m3 TWA total dust ; 5 mg/m3 TWA respirable fraction
Mexico:	10 mg/m3 TWA VLE-PPT dust
Acetonitrile	**75-05-8**

ACGIH:	20 ppm TWA
	Skin - potential significant contribution to overall exposure by the cutaneous route
NIOSH:	20 ppm TWA ; 34 mg/m3 TWA
	500 ppm IDLH
Europe:	40 ppm TWA ; 70 mg/m3 TWA
	Possibility of significant uptake through the skin
OSHA (US):	40 ppm TWA ; 70 mg/m3 TWA
	prevent or reduce skin absorption (as CN) (related to Cyanide compounds)
Mexico:	40 ppm TWA VLE-PPT ; 70 mg/m3 TWA VLE-PPT
	60 ppm STEL [PPT-CT]; 105 mg/m3 STEL [PPT-CT]
Carbon, activated	**7440-44-0**
Mexico:	2 mg/m3 TWA VLE-PPT dust
Cellulose	**9004-34-6**
ACGIH:	10 mg/m3 TWA
NIOSH:	10 mg/m3 TWA total dust ; 5 mg/m3 TWA respirable dust
OSHA (US):	15 mg/m3 TWA total dust ; 5 mg/m3 TWA respirable fraction
Mexico:	10 mg/m3 TWA VLE-PPT
	20 mg/m3 STEL [PPT-CT]

EU - Occupational Exposure (98/24/EC) - Binding Biological Limit Values and Health Surveillance Measures

There are no biological limit values for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Provide local exhaust or process enclosure ventilation system. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection
Wear appropriate chemical resistant clothing.

Respiratory Protection
No respirator is required under normal conditions of use. Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Glove Recommendations
Wear appropriate chemical resistant gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	solid	**Physical State**	solid
Odor	Not available	**Color**	Not available
Odor Threshold	Not available	**pH**	Not available
Melting Point	Not available	**Boiling Point**	Not available
Boiling Point Range	Not available	**Freezing point**	Not available
Evaporation Rate	Not available	**Flammability (solid, gas)**	Not available
Autoignition Temperature	Not available	**Flash Point**	Not available
Lower Explosive Limit	Not available	**Decomposition temperature**	Not available
Upper Explosive Limit	Not available	**Vapor Pressure**	Not available
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	Not available
Water Solubility	Not available	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Solubility (Other)**	Not available
Density	Not available	**Physical Form**	solid
Molecular Weight	Not available		

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Will not polymerize.

Conditions to Avoid
Avoid accumulation of airborne dusts. Avoid heat, flames, sparks and other sources of ignition. Protect from physical damage and heat. Avoid contact with incompatible materials.

Incompatible Materials

Acids, bases, combustible materials, halocarbons, halogens, metal carbide, metal oxides, metal salts, metals, oxidizing materials, peroxides, reducing agents

Hazardous decomposition products

Thermal decomposition products
Cyanides Hydrogen fluoride oxides of aluminum oxides of boron Oxides of carbon oxides of nitrogen

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
central nervous system damage, kidney damage, lung damage, respiratory system damage, cancer

Skin Contact
irritation

Eye Contact
burns

Ingestion
central nervous system damage

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
Acetonitrile (75-05-8)
Oral LD50 Rat 160 mg/kg
Dermal LD50 Rabbit 390 mg/kg
Inhalation LC50 Rat 26.8 mg/L 4 h
Carbon, activated (7440-44-0)
Oral LD50 Rat >10000 mg/kg
Cellulose (9004-34-6)
Oral LD50 Rat >5 g/kg
Inhalation LC50 Rat >5800 mg/m3 4 h

Product Toxicity Data

Acute Toxicity Estimate

Inhalation - Dust and Mist	> 5 mg/L

Immediate Effects
Toxic in contact with skin, Harmful if swallowed, skin irritation, eye burns, central nervous system damage, respiratory system damage

Delayed Effects
mutagenic effects, cancer, lung damage, bone damage, central nervous system damage, circulatory system damage, kidney damage, liver damage, respiratory system damage

Irritation/Corrosivity Data
skin irritation, eye burns

Respiratory Sensitization
no data available.

Dermal Sensitization

no data available.

Component Carcinogenicity

Aluminum	**7429-90-5**
ACGIH:	A4 - Not Classifiable as a Human Carcinogen
Acetonitrile	**75-05-8**
ACGIH:	A4 - Not Classifiable as a Human Carcinogen

Aluminum itself has not been evaluated by IARC. However, aluminum production has been evaluated as IARC Group 1 (Human Sufficient Evidence). There is sufficient evidence that certain exposures occurring during aluminum production cause cancer.

Germ Cell Mutagenicity
Available data characterizes this substance as mutagenic.

Tumorigenic Data
No data available

Reproductive Toxicity
No data available for the mixture.

Specific Target Organ Toxicity - Single Exposure
central nervous system, respiratory system

Specific Target Organ Toxicity - Repeated Exposure
lungs, skeletal system, central nervous system, circulatory system, kidneys, liver, respiratory system

Aspiration hazard
no data available.

Medical Conditions Aggravated by Exposure
Alzheimer's disease, central nervous system disorders, heart or cardiovascular disorders, kidney disorders, liver disorders, respiratory disorders, skin disorders and allergies

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

Acetonitrile	**75-05-8**
Fish:	LC50 96 h Pimephales promelas 1600 - 1690 mg/L [flow-through]; LC50 96 h Pimephales promelas 1000 mg/L [static]; LC50 96 h Lepomis macrochirus 1850 mg/L [static]; LC50 96 h Poecilia reticulata 1650 mg/L [static]

Persistence and Degradability
No data available for the mixture.

Bioaccumulative Potential
No data available for the mixture.

Mobility
No data available for the mixture.

Other Toxicity
no data available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose in accordance with all applicable regulations.

Section 14 - TRANSPORT INFORMATION

Component Marine Pollutants
This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants

Component	CAS #	Minimum Concentration
Acetonitrile	**75-05-8**	DOT regulated marine pollutant (mixtures or solutions) (related to Cyanide compounds)

US DOT Information:
Shipping Name: CAPACITOR
Hazard Class: 9
UN/NA #: UN3499
Required Label(s): 9
Additional information: Not regulated as dangerous goods.

IMDG Information:
Shipping Name: CAPACITOR, ELECTRIC DOUBLE LAYER
Hazard Class: 9
UN#: UN3499
Required Label(s): 9
Additional information: Not regulated as dangerous goods.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Aluminum	**7429-90-5**
SARA 313:	1 % de minimis concentration (dust or fume only)
Acetonitrile	**75-05-8**
SARA 313:	1 % de minimis concentration
CERCLA:	5000 lb final RQ ; 2270 kg final RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes **Chronic Health:** Yes **Fire:** No **Pressure:** No **Reactivity:** No

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA

Aluminum	**7429-90-5**	Yes	Yes	Yes	Yes	Yes
Acetonitrile	**75-05-8**	Yes	Yes	Yes	Yes	Yes
Cellulose	**9004-34-6**	No	Yes	Yes	Yes	Yes

Not listed under California Proposition 65

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL)
Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Aluminum	**7429-90-5**
	1 %
Acetonitrile	**75-05-8**
	0.1 %

Component Analysis - Inventory
Aluminum (7429-90-5)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes

Acetonitrile (75-05-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

Carbon, activated (7440-44-0)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes

Tetraethylammonium tetrafluoroborate (429-06-1)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	NSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes

Cellulose (9004-34-6)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

U.S. Inventory (TSCA)
All the components of this substance are listed on or are exempt from the TSCA inventory listing.

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 3 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Updated: 08/27/2015

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CFR - Code of Federal Regulations (US); CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KECI - Existing Chemicals Inventory; KECL – Existing Chemicals List; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; NDSL – Non-Domestic Substance List (Canada); NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TCCA – Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

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