Safety data sheet

according to Regulation (EU) No 2015/830

EFFEKTA®

Lithium iron phosphate accumulator

Version 1.0 Issue Date: 04.11.2020

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	:	US2000C, US3000C
Specifications	:	Lithium iron phosphate accumulator

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture	:	Energy storage / telecommunication backup power supply / electric car

1.3 Details of the supplier of the safety data sheet

Company	:	EFFEKTA Regeltechnik GmbH
Address	:	Rheinwaldstr. 34 78628 Rottweil Deutschland
Telephone	:	+49 (0)741 17451 0
Telefax	:	+49 (0)741 17451 22
E-mail address	:	post-an@axel-pasedag.de

1.4 Emergency telephone number

Emergency telephone number	:	Vergiftungs- Informations-Zentrale Freiburg +49 (0)761 19240

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No 1272/2008 (CLP)

Skin Irrit. 2	H315
Eye Dam. 1	H318
STOT RE 2	H373
Flam. Liq. 3	H226

2.1.2 Additional information: For full text of Hazard- and EU Hazard-statements: see SECTION 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms



Signal word: Danger

Hazard statements:

H315	Causes skin irritation
H318	Causes serious eye damage
H373	May cause damage to organs through prolonged or repeated exposure
H226	Flammable liquid and vapour

Precautionary statements:

P264	Wash exposed skin thoroughly after handling.
P280	Wear protective gloves / protective clothing / eye protection / face protection.
P260	Do not breathe dust/fume/gas/mist/ vapours/spray.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P302 + P352	IF ON SKIN: Wash with plenty water
P321	Specific treatment (see section 4 on this SDS)
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P314	Get medical advice/attention if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370 + P378	In case of fire: Use dry chemical fire extinguishers,carbon dioxide fire extinguishers,foam to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.

P501	Dispose of contents/container in accordance with local/regional/national/international regulations

Supplemental Hazard information (EU): Not applicable.

2.3 Other hazards

no information available.

SECTION 3. Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Registration number	Classification according to Regulation (EU) 1272/2008 (CLP)	Concentration (% w/w)
Lithium iron phosphate(CAS No:15365-14-7)(EC No:604-917-2)		
		40-50%
Graphite (CAS No:7782-42-5)(EC No:231-955-3)		
		15-25%
Copper (CAS No:7440-50-8)(EC No:231-159-6)		
		5-10%
aluminium(CAS No:7429-90-5)(EC No:231-072-3)		
		5-10%
Poly(vinylidene fluoride)(CAS No:24937-79-9)(EC No:607-458-6)		
		5-10%
Carbon black (CAS No:1333-86-4)(EC No:215-609-9)		
		1-10%
(PAA)/2-PROPENOIC ACID, HOMOPOLYMER(CAS No:9003-01-4)(EC No:618-347-7)		
		1-5%
Lithium hexafluorophosphate(1-) (CAS No:21324-40-3)(EC No:244-334-7)		
	Acute Tox. 3,H301 Skin Corr. 1A,H314 Eye Dam. 1,H318 STOT RE 1,H372 (Tooth, Bone)	1-5%

nickel(CAS No:7440-02-0)(EC No:231-111-4)		
		0.1-1.0%
Carboxymethyl cellulose sodium salt(CAS No:9004-32-4)(EC No:618-378-6)		
		0.1-1.0%
Ethylene carbonate(CAS No:96-49-1)(EC No:202-510-0)		
	Eye Irrit. 2,H319	0.1-1.0%
dimethyl carbonate (CAS No:616-38-6)(EC No:210-478-4)		
	Flam. Liq. 2,H225	0.1-1.0%
Carbonic acid, ethyl methyl ester (CAS No:623-53-0)(EC No:613-014-2)		
	Flam. Liq. 3,H226 Skin Irrit. 2,H315 Eye Irrit. 2,H319 STOT SE 3,H335	0.1-1.0%

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice : If potential for exposure exists refer to Section 8 for specific personal protective equipment.

If inhaled : Move person to fresh air; If symptoms persist, consult a physician.

On skin contact : Take off contaminated clothing and shoes immediately. Flush contact area with lukewarm water.If irritation persists, consult a physician.

On contact with eyes : If you use contact lenses, remove the lenses first.Wash affected eyes for at least 15 minutes under running water with eyelids held open. If symptoms occur, consult a physician, preferably an ophthalmologist.

On ingestion : Rinse mouth immediately and then drink plenty of water, seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Treatment of exposure should be directed at the the clinical condition of the patient.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Dry chemical fire extinguishers.Carbon dioxide fire extinguishers.Foam.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.Combustion generates toxic fumes of the following：Carbon oxides.

5.3 Advice for firefighters

Special protective equipment	:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves).If protective equipment is not available or not used, fight fire from a protected location or safe distance.
Further information	:	No information available.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Avoid breathing vapor.Avoid skin contact.Ensure adequate ventilation.Remove all sources of ignition. Use personal protective equipment.

6.2 Environmental precautions

Environmental precautions	:	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up	:	Contain spilled material if possible.Collect in suitable and properly labeled containers.Then store and dispose of according to local regulations.

6.4 Reference to other sections

References to other sections, if applicable, have been provided in the previous sub-sections.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Avoid breathing vapors.Avoid contact with the skin, eyes and clothing.Wear safety glasses with side shields.
Advice on protection against fire and explosion	:	Sources of ignition should be kept well clear.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep container tightly closed in a cool, well-ventilated place.Keep away from heat, sparks and flames.

7.3 Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Chemical name	Occupational Exposure Limits		Regulation
Graphite	TWA	2 mg/m3	Belgium
Graphite	TWA	2 mg/m3,5 mg/m3 respirable aerosol	Denmark
Graphite	STEL	5 mg/m3 respirable aerosol	Denmark
Graphite	TWA	2 mg/m3	Finland
Graphite	TWA	2 mg/m3 respirable aerosol	France
Graphite	TWA	4 mg/m3 inhalable aerosol,1 mg/m3,5 mg/m3 respirable aerosol	Germany (DFG)

Graphite	TWA	10 mg/m3,4 mg/m3	Ireland
Graphite	TWA	2 mg/m3 (1	Latvia
Graphite	TWA	2 mg/m3 inhalable aerosol	Spain
Graphite	TWA	5 mg/m3 inhalable aerosol	Sweden
Graphite	TWA	5 mg/m3 inhalable aerosol,2 mg/m3,5 mg/m3 respirable aerosol	Switzerland
Graphite	TWA	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	United Kingdom
Aluminium metal	TWA	5 mg/m3 inhalable aerosol,2 mg/m3 respirable aerosol	Denmark
Aluminium metal	STEL	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	Denmark
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,5 mg/m3 respirable aerosol	France
Aluminium metal	TWA	4 mg/m3 inhalable aerosol,1 mg/m3,5 mg/m3 respirable aerosol	Germany (DFG)
Aluminium metal	TWA	6 mg/m3 respirable aerosol	Hungary
Aluminium metal	TWA	1 mg/m3	Ireland
Aluminium metal	TWA	2 mg/m3	Latvia
Aluminium metal	TWA	10 mg/m3	New Zealand
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,5 mg/m3 respirable aerosol	Spain
Aluminium metal	TWA	3 mg/m3 respirable aerosol	Switzerland
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	United Kingdom
Carbon black	TWA	3 mg/m3,5 mg/m3	Belgium
Carbon black	TWA	3 mg/m3,5 mg/m3	Denmark
Carbon black	STEL	7 mg/m3,0 mg/m3	Denmark
Carbon black	TWA	3 mg/m3,5 mg/m3	Finland
Carbon black	STEL	7 mg/m3	Finland
Carbon black	TWA	3 mg/m3,5 mg/m3	France
Carbon black	TWA	3 mg/m3,5 mg/m3	Ireland
Carbon black	STEL	7 mg/m3	Ireland
Carbon black	TWA	3 mg/m3,5 mg/m3	Spain

8.2 Exposure controls

Eye protection : Not required under normal conditions. If battery case is damaged, wear chemical goggles or face shield.

Hand protection : None required under normal conditions. Wear safety glasses if handling a damaged battery.

Body and skin protection : Where there is potential for skin contact, have available and wear as appropriate, impervious gloves, apron, pants, jacket, hood and boots.

General safety and hygiene measures	:	Wash hands before breaks and after handling the product.
Respiratory protection	:	None required under normal conditions.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	:	Solid
Odour	:	no data available
Odour threshold	:	no data available
pH	:	no data available
Melting point	:	not applicable
Boiling point	:	not applicable
Flash point	:	33℃
Evaporation rate	:	no data available
Flammability (solid, gas)	:	not applicable
Upper/lower flammability or explosive limits	:	no data available
Vapour pressure	:	no data available
Vapour density	:	no data available
Relative density	:	no data available
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Decomposition temperature	:	no data available

Viscosity, dynamic	:	no data available
Explosive properties	:	none
Oxidising properties	:	none

9.2 Other information :
no data available

SECTION 10: Stability and Reactivity

10.1 Reactivity	:	No hazardous reactions if stored and handled as prescribed/indicated.
10.2 Chemical stability	:	Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions	:	This product is considered stable.However, avoid contact with ignition sources (e.g. sparks, open flame, heated surfaces).
10.4 Conditions to avoid	:	Avoid all sources of ignition: heat, sparks, open flame.
10.5 Incompatible materials	:	Strong oxidizers.
10.6 Hazardous decomposition products	:	No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on toxicological effects

Acute toxicity

Acute Toxicity: oral

Nickel
LD50/rat:> 9 000 mg/kg bw

Lithium hexafluorophosphate(1-)
LD50/rat:50 - 300 mg/kg bw

Graphite
LD50/rat:> 2 000 mg/kg bw

Ethylene carbonate
LD50/rat:10 400 mg/kg bw

Dimethyl carbonate
LD50/rat:> 5 000 mg/kg bw

Copper
LD50/rat:300 - 500 mg/kg bw

Carbon black
LD50/rat:> 8 000 mg/kg bw

Aluminium
LD50/rat:> 15 900 mg/kg bw

Acute Toxicity: inhalation

Nickel
NOAEC/66 min/rat:>= 10.2 mg/L air

Graphite
LC50/4 h/rat:> 2 000 mg/m3; air

Ethylene carbonate
LC0/8 h/rat:730 mg/m3; air

Dimethyl carbonate
LC50/4 h/rat:> 5.36 mg/L air (analytical)

Copper
LC50/4 h/rat:> 5.11 mg/L air

Aluminium
LC0/4 h/rat:0.888 mg/L air (analytical)

Acute Toxicity: dermal

Ethylene carbonate
LD50/rat:> 2 000 mg/kg bw

Dimethyl carbonate
LD50/rabbit:> 2 000 mg/kg bw

Copper
LD50/rat:> 2 000 mg/kg bw

Skin irritation/corrosion

Nickel
rabbit
not irritating

Lithium hexafluorophosphate(1-)
human
corrosive

Graphite
rabbit
not irritating

Ethylene carbonate
rabbit
not irritating

Dimethyl carbonate
rabbit
not irritating

Copper
rabbit
not irritating

Aluminium
rabbit
not irritating

Serious eye damage/irritation

Nickel
rabbit
not irritating

Lithium hexafluorophosphate(1-)
Fresh, fertilised brown leghorn chicken eggs
severe irritant

Graphite
rabbit
not irritating

Ethylene carbonate
rabbit
Category 2 (irritating to eyes) based on GHS criteria

Dimethyl carbonate
rabbit
not irritating

Copper
rabbit
slightly irritating

Carbon black
rabbit
not irritating

Aluminium
rabbit
not irritating

Respiratory or skin sensitisation

Lithium hexafluorophosphate(1-)
mouse
not sensitising

Graphite
mouse
not sensitising

Ethylene carbonate
guinea pig
non-sensitizer

Dimethyl carbonate
guinea pig
not sensitising

Copper
guinea pig
not sensitising

Carbon black
guinea pig
not sensitising

Aluminium
guinea pig
not sensitising

Germ cell mutagenicity: in vitro

Lithium hexafluorophosphate(1-)
negative

Graphite
negative

Ethylene carbonate
negative

Dimethyl carbonate
negative

Copper
negative

Carbon black
negative

Aluminium
negative

Germ cell mutagenicity: in vivo

Lithium hexafluorophosphate(1-)
negative

Dimethyl carbonate
negative

Copper
negative

Carbon black
negative

Aluminium
negative

Carcinogenicity

Nickel
Suspected of causing cancer.

Ethylene carbonate
No evidence of carcinogenicity in the study animals was observed.

Carbon black
No evidence of carcinogenicity in the study animals was observed.

Aluminium
No evidence of carcinogenicity in the study animals was observed.

Reproductive toxicity

Lithium hexafluorophosphate(1-)
Animal tests showed no developmental toxicity

Graphite
Animal tests showed no developmental toxicity

Ethylene carbonate
Animal tests showed no developmental toxicity

Dimethyl carbonate
Animal tests showed no developmental toxicity

Copper
Animal tests showed no developmental toxicity

Carbon black
Animal tests showed no developmental toxicity

Aluminium
Animal tests showed no developmental toxicity

STOT-single exposure

No information available

STOT-repeated exposure

No information available

Aspiration hazard

No information available

SECTION 12: Ecological information

12.1 Toxicity

Short-term toxicity to fish

Nickel
LC50/96 h/Oncorhynchus mykiss (previous name: Salmo gairdneri):15.3 mg/L

Lithium hexafluorophosphate(1-)
EC50/96 h/other: Oncorhynchus mykiss, Salmo Trutta:51 mg/L

Graphite
LC50/96 h/Danio rerio (previous name: Brachydanio rerio):> 100 mg/L

Carbon black
LC0/96 h/Danio rerio (previous name: Brachydanio rerio):1 000 mg/L

Aluminium
LC50/96 h/Pimephales promelas:1.16 mg/L

Long-term toxicity to fish

Nickel
NOEC/32 d/Pimephales promelas:0.057 mg/L

Lithium hexafluorophosphate(1-)
LC50/20 d/other: Rainbow trout (Neuhold and Sigler, 1960). Rainbow and brown trout (Camargo, 1966).

Aluminium
NOEC/7 d/Pimephales promelas:0.4 mg/L

Short-term toxicity to aquatic invertebrates

Nickel
LC50/48 h/Ceriodaphnia dubia:276 µg/L

Lithium hexafluorophosphate(1-)
LC50/48 h/Daphnia magna:> 100 mg/L

Graphite
NOEC/48 h/Daphnia magna:>= 100 mg/L

Carbon black

EC100/24 h/Daphnia magna:10 000 mg/L

Aluminium
LC50/48 h/Ceriodaphnia dubia:0.72 mg/L

Long-term toxicity to aquatic invertebrates

Nickel
EC10/10 d/other: Chironomus tentans (now known as Chironomus dilutus):404.3 µg/L

Lithium hexafluorophosphate(1-)
NOEC/21 d/Daphnia magna:3.7 mg/L

Aluminium
NOEC/6 d/Ceriodaphnia dubia:1.02 mg/L

Toxicity to microorganisms

Nickel
EC50/30 min/activated sludge:33 mg/L

Lithium hexafluorophosphate(1-)
EC50/3 h/activated sludge of a predominantly domestic sewage:> 1 000 mg/L

Graphite
EC20/3 h/activated sludge of a predominantly domestic sewage:> 1 012.5 mg/L

Carbon black
EC10/3 h/activated sludge, domestic:ca. 800 mg/L

12.2 Persistence and degradability

Lithium hexafluorophosphate(1-)
Rapid reaction with water releases HF and LiF, leading to production of dissolved F- ions; subsequently, release of Li+ and PO4(3-) ions will follow.

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Observe national and local legal requirements.
Contaminated packaging	:	Uncontaminated packaging can be re-used.

SECTION 14: Transport Information

Land transport

ADR

14.1. UN number	:	3480
14.2. UN proper shipping name:	:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	:	9
14.4. Packing group	:	II
14.5. Environmental hazards	:	Yes
14.6. Special precautions for user	:	none

Sea transport

IMDG

14.1. UN number	:	3480
14.2. UN proper shipping name:	:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	:	9
14.4. Packing group	:	II
14.5. Environmental hazards	:	Yes

14.6. Special precautions for user	:	none

Air transport

IATA/ICAO

14.1. UN number:	:	3480
14.2.UN proper shipping name:	:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	:	9
14.4. Packing group:	:	II
14.5. Environmental hazards:	:	Yes
14.6. Special precautions for user	:	none

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Other regulations	:	Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment/Chemical Safety Report may not be required because: substance(s) are exempted from being registered under REACH, are not yet registered under REACH, are registered under another regulatory process (biocide uses, plant protection products), the volume is below the 10 tons/year threshold specified under Art.14(1) of REACH, the concentration of substance(s) in a mixture is/are below the limits specified under Art. 14(2) of REACH.

SECTION 16: Other information

Full text of H-Statements referred to under section 3.

H301	Toxic if swallowed
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation

H318	Causes serious eye damage
H319	Causes serious eye irritation
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H335	May cause respiratory irritation
H372	Causes damage to organs through prolonged or repeated exposure

Abbreviations and acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute toxicity estimate
CAS-No.	Chemical Abstracts Service number
CLP	Classification, Labelling and Packaging
EbC50	Concentration at which 50% reduction of biomass is observed
EC50	Median effective concentration
EN	European Norm
EPA	Environmental Protection Agency
ErC50	Concentration at which a 50% inhibition of growth rate is observed
EyC50	Concentration at which 50 % inhibition of yield is observed
IATA_C	International Air Transport Association (Cargo)
IBC	International Bulk Chemical Code
ICAO	International Civil Aviation Organization
ISO	International Standard Organization
IMDG	International Maritime Dangerous Goods
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Marine Pollution from
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No observed adverse effect level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
OECD	Organisation for Economic Co-operation and Development
OPPTS	Office of Prevention, Pesticides and Toxic Substances
PBT	Persistent, Bioaccumulative and Toxic
STEL	Short term exposure limit
TWA	Time Weighted Average (TWA)
vPvB	very Persistent and very Bioaccumulative

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