

Material Safety Data Sheet (MSDS)

Section I – Manufacturer's Information

Manufacturer: **DYNAMIS Batterien GmbH**
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Product Name: LITHIUM- POLYMER Battery
System: Rechargeable Lithium-Ion Battery w/ fixed Polymer Electrolyte

Section II - Product's Component Information

<u>Components</u>	<u>Molecular formula</u>	<u>CAS No.</u>	<u>Content of met. in [%]</u>
Lithium Cobalt Oxide	LiCoO ₂	12190-79-3	30 - 35
Carbon	C	1333-86-4	20 - 25
Electrolyte	LiPF ₆	21324-40-3	1 - 2
PVDF	(CH ₂ -CF ₂) _n	24937-79-9	1 - 2
Acetylene Black	C	1333-86-4	0.5 – 1
SBR	(C ₈ H ₈ C ₄ H ₆) _x	9003-55-8	0.2 – 0.8
EC	C ₃ H ₃ O ₄	96-49-1	5 - 10
DMC	C ₃ H ₆ O ₃	616-38-6	5 – 10
Aluminium	Al	7429-90-5	10 - 15
Copper	Cu	7440-50-8	2 - 5
Dissepiment	-	-	2 – 5
Others	-	-	2 – 5

The components of a Li Polymer battery are only considered potentially dangerous in case of physical damage to a cell, openings, ruptures or punctual damages, or if dangerous situations are caused by electrical mistreatment.

Section III – Physical and Chemical Properties

n/a

Section IV - Emergency and First Aid measures

First Aid (in case of untightness):

1. Eyes:

The eyes shall be rinsed with plenty of water as quickly as possible and for a minimum of 15 minutes, the eye lid shall be lifted occasionally in order to rinse the eye surface below the lid as well.

Call for medical assistance.

2. Skin Contact:

Contaminated clothing shall be removed quickly and the respective skin areas shall be flushed with plenty of water. Continue flushing for at least 15 minutes (if accessible use lab shower / emergency shower), call for medical assistance.

3) Inhalation of Emitted Gas:

Remove the respective person from the endangered area and move to a fresh air zone. If supporting oxygen for emergency breathing is available, use in its proper way. In case of difficulties to breathe, call for medical help immediately.

Flush the endangered area with fresh air.

4) Ingestion:

Call for medical help immediately.

Section V – Fire and Explosion

Extinguishing Media: Powder, Water

Fire Fighting Method: Self-contained breathing apparatus may be necessary, wear protective clothes.

Unusual Fire- And Explosion Hazards: Toxic gases (HF, PF₆) may be generated if cells or batteries are exposed to fire. Cells and batteries may burn as well or emit dangerous organic vapors if they are exposed to excessive heat, fire or high voltage. Damaged or opened cells may generate heat by themselves by reaction with air and emit ignitable gases.

Section IV – Handling / Use and Storage

1) Prevent cells and batteries from short circuits during storage and operation

2) Do not place batteries close to sources of heat and keep away from direct sunlight for longer terms because this may cause high cell temperatures shortening the service life

3) Charging

Use only suitable chargers and charging methods. Wrong charging methods can lead to damages and/or ignition

4) Opening or tear-down of batteries

Do not open or tear-down a battery. In case a battery is accidentally damaged or cracked in pieces, do wear protective gloves for handling the debris and parts. Avoid inhalation of potentially occurring gases.

5) Short-circuits

Avoid any kind of short-circuit. Short-circuits lead to evolution of excessive heat, e.g. at the poles and may propose a source of ignition.

In any case a short-circuit will shorten the service life of a battery dramatically and may also cause ignition of other materials nearby, inside materials will be damaged substantially as well.

Physical contact with short-circuited batteries can cause skin burns.

Do also avoid wrong polarisation assemblies - these may lead to short-circuit situations alike.

6) Mixed batteries and types

Do not connect batteries of different types with each other, as well as the assembly of packs using cells of significant different age. Of course do not mix different chemical system batteries.

Section VII- Disposal

DYNAMIS Lithium Polymer cells and batteries do not contain toxic metals exceeding naturally occurring traces as part of chemical components.

Please do contact your local authorities according the applicable local laws.

Section VIII – Transport Information

According PACKING INSTRUCTION 965 ~ 967 of IATA DGR 61st Edition (2020) for transportation, or Special Provision 188 of IMDG.

Furthermore new restrictions apply since April 1, 2016, which forbid transport of Lithium batteries on passenger aircraft at all and strengthen limits even for small numbers and cells on cargo aircraft.

Additional information acc. transport, test, markings and packing methods can be taken from Label master <http://www.labelmaster.com> .

The batteries must be secured against short-circuit for transport using appropriate packages, e.g. with separating functions. These packages must also be protective against outer mechanical damage.

Falling down or other typical incidents must not lead to possible short-circuits. Do avoid many layer packing due to the weight and excessive humidity.

Ways of transport: Air, Land, Sea

Packing information: Resp. Documents

Section IX – Additional Information

The information given above is based on the current knowledge of DYNAMIS. Possible changes to information and recommendations deriving from sources elsewhere may not have been considered in this issue. Current incidents and their consequences to recommendations of which DYNAMIS has not been aware yet do not lead to responsibilities beyond the information given above or for those in contradiction to any part of it.

This information is provided to our customers under the condition, that every customer develops its own view for feasibilities and risks and takes care of the products accordingly.