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

1.1. Product identifier
Lithium-ion battery

Further trade names
Battery Typ:
12V 19.2Wh; 12V24WH; 12V28.8Wh; 12V36Wh; 12V42Wh; 12V48Wh; 12V60Wh; 12V72Wh; 12V84Wh; 12V96Wh

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

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

Use of the substance/mixture
Lithium-Ion battery

1.3. Details of the supplier of the safety data sheet

Company name:	Robert Bosch GmbH Automotive Aftermarket
Place:	D-76227 Karlsruhe
Telephone:	+49 721-942-0
Responsible Department:	Responsible for the safety data sheet: sds@gbk-ingelheim.de
1.4. Emergency telephone number:	INTERNATIONAL: +49 - (0) 6132 - 84463, GBK GmbH (24h - 7d/w - 365d/a) England and Wales: NHS Direct - 0845 4647; Scotland: NHS 24 - 08454 24 24 24

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008
Hazard categories:
Acute toxicity: Acute Tox. 4
Skin corrosion/irritation: Skin Corr. 1A
Serious eye damage/eye irritation: Eye Dam. 1
Specific target organ toxicity - repeated exposure: STOT RE 2
Hazard Statements:
Harmful if swallowed.
Causes severe skin burns and eye damage.
Causes serious eye damage.
May cause damage to organs through prolonged or repeated exposure.

The following information is required only in case of exposure to interior battery components after damage of the external battery casing.
Undamaged, closed batteries do not represent a danger to the health.

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

2.2. Label elements

Regulation (EC) No. 1272/2008

Hazard components for labelling
Lithium hexafluorophosphate
Ethylene carbonate

Signal word: Danger

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

Pictograms:



Hazard statements

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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.
P501	Dispose of contents/container to in accordance with local and national regulations.

Additional advice on labelling

There is no hazard when the measures for handling and storage are followed.

2.3. Other hazards

No hazards in case of an intact battery and observation of the instructions for use.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

Lithium-Ion Battery: Mixture of the following substances
Plastic container:
< 22,6 % PA66 CAS 32131-17-2
< 9,7 % Glass, oxide, chemicals CAS 65997-17-3

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	Classification according to Regulation (EC) No. 1272/2008 [CLP]			
15365-14-7	Iron lithium phosphate			< 19 %
	476-700-9			
7440-50-8	Copper			< 10,6 %
	231-159-6		01-2119480154-42	
7782-42-5	Graphite			< 8,1 %
	231-955-3		01-2119486977-12	
21324-40-3	Lithium hexafluorophosphate			< 6,1 %
	244-334-7		01-2119383485-29	
	Acute Tox. 3, Skin Corr. 1A, Eye Dam. 1, STOT RE 1; H301 H314 H318 H372			
96-49-1	Ethylene carbonate			< 6,1 %
	202-510-0		01-2119540523-46	
	Acute Tox. 4, Eye Irrit. 2, STOT RE 2; H302 H319 H373			
616-38-6	dimethyl carbonate			< 6,1 %
	210-478-4	607-013-00-6	01-2119548399-23	
	Flam. Liq. 2; H225			
7429-90-5	Aluminium			< 4,7 %
	231-072-3		01-2119529243-45	
9003-07-0	Polypropylene, homopolymer			< 3,4 %
9002-88-4	Polyethylene			< 3,4 %
	618-339-3			
24937-79-9	Poly(vinylidene fluoride) (PVDF)			< 1,4 %
9004-32-4	Carboxymethyl cellulose sodium salt			< 0,4 %
	618-378-6			
9003-55-8	Styrene Butadiene Rubber (SBR)			< 0,4 %

Full text of H and EUH statements: see section 16.

Further Information

Because of the battery structure the dangerous ingredients will not be available if used properly.
Undamaged, closed batteries do not represent a danger to the health.

information:
The terminals contain 60% copper (CAS No. 7740-50-8), 40% zinc (CAS No. 7740-66-6), max. 0,5% lead(CAS-Nr. 7439-92-1) and max. 0,004% cadmium (CAS-Nr. 7440-43-9).

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.
Undamaged, closed batteries do not represent a danger to the health.

After inhalation
Ensure of fresh air.
Wash mouth and nasal passages with water.
Call a physician immediately.
If patient is not breathing, apply artificial respiration.
Do not make mouth-to-mouth resuscitation.
Corrosive to the respiratory tract.

After contact with skin
Wash off immediately with plenty of water and soap for at least 15 minutes.
Take off contaminated clothing and wash it before reuse.
Call a physician immediately.

After contact with eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
Seek medical treatment by eye specialist.

After ingestion
Rinse mouth.
Drink plenty of water or milk.
Never give anything by mouth to an unconscious person.
Do not induce vomiting.
Call a physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

In case of electrolyte leakage:
Causes severe irritation of eyes, skin and mucous membranes.
Ingestion of aqueous solution causes gastrointestinal burns.
May cause respiratory irritation.
Coughing
Shortness of breath

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptoms.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Use in case of small fire: Water, carbon dioxide (CO_2), Dry powder, Sand.
Use in case of large fire: water spray jet, Alcohol-resistant foam.
Unsuitable extinguishing media
Not known.

5.2. Special hazards arising from the substance or mixture

During contact of electrolyte with water hydrofluoric acid can be formed.
Heat development under short-circuit conditions.
Fire may produce:
Smoke contains combustible, irritating/corrosive and toxic gases.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit.

Additional information
If possible, remove batteries from fire fighting area. If heated above 125°C, batteries can vent.
Batteries is not flammable but internal organic material will burn if the batteries is incinerated.
Stand upwind of the fire while extinguishing

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

Collect contaminated water / firefighting water separately.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

The following information is required only in case of exposure to interior battery components after damage of the external battery casing.
Undamaged, closed batteries do not represent a danger to the health.

Use personal protective clothing.
Avoid contact with skin, eyes and clothing.
Avoid breathing fume and gas.
Keep away noninvolved persons.
Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/ground water.

6.3. Methods and material for containment and cleaning up

Take up mechanically and send for disposal.
Waste disposal according to local regulations.
In case of electrolyte leakage:
Take up with absorbent material (e.g. general-purpose binder).

6.4. Reference to other sections

Information for safe handling look up chapter 7.
Information for personal protective equipment look up section 8.
Information for disposal see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Follow the directions.
Avoid short circuiting the battery. Avoid mechanical damage of the battery. Do not open or disassemble.

Do not throw into fire.
Handle in accordance with good industrial hygiene and safety practice.
At work do not eat, drink and smoke.
Wash hands and skin before breaks and after work.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Store only in original container at cool and aired place.
Protect from moisture.

Further information on storage conditions

Protect from heat and direct solar radiation.

7.3. Specific end use(s)

Lithium-Ion Battery
Note: This product is an "article".

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

Exposure limits (EH40)

CAS No	Substance	ppm	mg/m³	fibres/ml	Category	Origin
7429-90-5	Aluminium metal, inhalable dust	-	10		TWA (8 h)	WEL
		-	-		STEL (15 min)	WEL
7440-50-8	Copper, fume	-	0.2		TWA (8 h)	WEL
		-	-		STEL (15 min)	WEL
16984-48-8	Fluoride (inorganic as F)	-	2.5		TWA (8 h)	WEL
		-	-		STEL (15 min)	WEL

Additional advice on limit values

During normal charging and discharging there is no release of product.
No hazards in case of an intact battery and observation of the instructions for use.

8.2. Exposure controls

Appropriate engineering controls

Ensure adequate ventilation.
Provide eye bath.
Provide emergency shower.

Protective and hygiene measures

Handle in accordance with good industrial hygiene and safety practice.
When using do not eat, drink or smoke.
Wash hands and skin before breaks and after work.

Eye/face protection

No special measures necessary if used correctly.
In case of electrolyte leakage: Safety goggles with side protection, Face shield

Hand protection

No special measures necessary if used correctly.
In case of electrolyte leakage: Wear suitable gloves

Skin protection

No special measures necessary if used correctly.
In case of electrolyte leakage: Protective suit. Chemical resistant apron (EN 467). Boots.

Respiratory protection

No special measures necessary if used correctly.
If the occupational exposure limit is exceeded, suitable respiratory protection must be worn.
In case of electrolyte leakage: Wear respiratory protection.

Environmental exposure controls

No special measures necessary if used correctly.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	Solid, Battery
Colour:	n.a.
Odour:	Odourless
pH-Value:	n.a.

Changes in the physical state

Flash point:	n.a.
Lower explosion limits:	n.a.
Upper explosion limits:	n.a.

Auto-ignition temperature

Solid:	n.a.

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

Water solubility: insoluble

9.2. Other information

Battery Typ:
12V 19.2Wh; 12V24WH; 12V28.8Wh; 12V36Wh; 12V42Wh; 12V48Wh; 12V60Wh; 12V72Wh; 12V84Wh; 12V96Wh

SECTION 10: Stability and reactivity

10.1. Reactivity

No uncommon reactivity known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

10.4. Conditions to avoid

Short circuit
Overcharge
Incompatible materials
heat, sparks, open flames, hot surfaces
Handle with care - avoid shock, friction and impact.
Avoid high temperatures
Protect against direct sun radiation.
Protect from atmospheric moisture and water.

10.5. Incompatible materials

Marine water, Water, strong oxidizing agents, Strong acid.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.
Heat development under short-circuit conditions.
Fire may produce: toxic gases/vapours, Metallic oxides, carbon monoxide (CO), carbon dioxide (CO2).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicocinetics, metabolism and distribution

No hazards in case of an intact battery and observation of the instructions for use.
Undamaged, closed batteries do not represent a danger to the health.

Acute toxicity

Harmful if swallowed.
There is no hazard when the measures for handling and storage are followed.

ATEmix calculated

ATE (oral) 925,9 mg/kg

CAS No	Chemical name				
	Exposure route	Dose		Species	Source
21324-40-3	Lithium hexafluorophosphate				
	oral	LD50 mg/kg	50 - 300	Rat	
96-49-1	Ethylene carbonate				
	oral	ATE	500 mg/kg		
616-38-6	dimethyl carbonate				
	oral	LD50	13000 mg/kg	Ratte	GESTIS
	dermal	LD50	> 5000 mg/kg	Kaninchen	GESTIS

Irritation and corrosivity

Causes severe skin burns and eye damage.

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Sensitising effects
Based on available data, the classification criteria are not met.

Carcinogenic/mutagenic/toxic effects for reproduction
Based on available data, the classification criteria are not met.

STOT-single exposure
Based on available data, the classification criteria are not met.

STOT-repeated exposure
May cause damage to organs through prolonged or repeated exposure. (Lithium hexafluorophosphate)

Aspiration hazard
Based on available data, the classification criteria are not met.

Practical experience

Other observations
If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

SECTION 12: Ecological information

12.1. Toxicity
There is no hazard when the measures for handling and storage are followed.

12.2. Persistence and degradability
No data available

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
The following information is required only in case of exposure to interior battery components after damage of the external battery casing.
Harmful to the environment
Should not be released into the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal
Waste disposal according to local regulations.
Do not incinerate.

Waste disposal number of waste from residues/unused products

160605	WASTES NOT OTHERWISE SPECIFIED IN THE LIST; batteries and accumulators; other batteries and accumulators

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number:	UN 3480
14.2. UN proper shipping name:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	9
14.4. Packing group:	-
Hazard label:	9A



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Classification code:	M4
Special Provisions:	188 230 348 376 377
Limited quantity:	0
Excepted quantity:	E0
Transport category:	2
Tunnel restriction code:	E

Inland waterways transport (ADN)

14.1. UN number:	UN 3480
14.2. UN proper shipping name:	Lithium-ion battery
14.3. Transport hazard class(es):	9
14.4. Packing group:	-
Hazard label:	9A



Classification code:	M4
Special Provisions:	188 230 348 376 377
Limited quantity:	0
Excepted quantity:	E0

Marine transport (IMDG)

14.1. UN number:	UN 3480
14.2. UN proper shipping name:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	9
14.4. Packing group:	-
Hazard label:	9A



Special Provisions:	188 230, 348, 376, 377
Limited quantity:	0
Excepted quantity:	E0
EmS:	F-A, S-I

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number:	UN 3480
14.2. UN proper shipping name:	LITHIUM ION BATTERIES
14.3. Transport hazard class(es):	9
14.4. Packing group:	-
Hazard label:	9A



Special Provisions:	A99 A154 A164 A183 A201 A206 A331
Limited quantity Passenger:	Forbidden
Passenger LQ:	Forbidden
Excepted quantity:	E0
IATA-packing instructions - Passenger:	Forbidden
IATA-max. quantity - Passenger:	Forbidden
IATA-packing instructions - Cargo:	See 965
IATA-max. quantity - Cargo:	See 965

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS:	no

This Safety Data Sheet corresponds to the criteria of www.compliance-footprint.com

14.6. Special precautions for user

To avoid risks to human health and the environment, comply with the instructions for use.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

The transport takes place only in approved and appropriate packaging.

SECTION 15: Regulatory information

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

EU regulatory information

Additional information

No information available.

National regulatory information

Additional information

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

15.2. Chemical safety assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Changes

Changes in chapter: 3.2

Abbreviations and acronyms

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route
RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses
ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure
IMDG = International Maritime Code for Dangerous Goods
IATA/ICAO = International Air Transport Association / International Civil Aviation Organization
MARPOL = International Convention for the Prevention of Pollution from Ships
IBC-Code = International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
REACH = Registration, Evaluation, Authorization and Restriction of Chemicals
CAS = Chemical Abstract Service
EN = European norm
ISO = International Organization for Standardization
DIN = Deutsche Industrie Norm
PBT = Persistent Bioaccumulative and Toxic

LD = Lethal dose
LC = Lethal concentration
EC = Effect concentration
IC = Median immobilisation concentration or median inhibitory concentration

Relevant H and EUH statements (number and full text)

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.

Further Information

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product(s) and is based on the

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present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. (n.a. = not applicable; n.d. = not determined)

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)

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