Material - Safety - Data Sheet (MSDS)

for

Ansmann Lithium-Ion Batteries

single cells and multi-cell battery packs

Date of issue: 2011 - 06 - 10 Revision no: 6 Revision date: 2016 - 01 -07 Editor: Ansmann AG	The information contained within is provided as a service to our customers and for their information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate at the date of preparation. ANSMANN AG makes no warranty expressed or implied.

1. Product and Supplier Identification

Product name:	Ansmann Li-Ion Battery; Ansmann Li-Polymer Battery
Type:	Rechargeable Li-Ion battery
Models / types:	Prismatic and round cells
Electrochemical system:	negative electrode: graphite; positive electrode: metall oxide (proprietary)

Supplier:

Germany	ANSMANN AG
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Home / email:	ansmann.de / info@ansmann.de

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Phone / Facsimile:	+1 973 4395244 1012 / +1 973 2062006
email:	USA@ansmann.de

United Kingdom	ANSMANN UK LTD.
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Phone / Facsimile:	+44 (0) 870 609 2233 / +44 (0) 870609 2234
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Hong Kong	ANSMANN Energy Int. LTD.
Address:	Unit 3117-18, 31/F; Tower 1; Millenium City 1; No. 388 Kwun Tong Road; Kwun Tong, kowloon; Hong-Kong hongkong@ansmann.de

China	HuiZhou City ANSMANN Trading Co. LTD
Address:	Da Lian Industrial Park, Rengtu Village Ruhu Town Huicheng District, 516169 Huizhou City Guangdong, China china@ansmann.de

Sweden	ANSMANN Nordic AB
Address:	Victor Hasselblads Gata 11, 421 31 Västra Frölunda, Sweden nordic@ansmann.de

France	Ansmann Energy France
Address:	5, Place Copernic; Immeuble Boréal - Courcouronnes; F-91023 Evry Cedex; France

EMERGENCY CONTACT: For chemical emergency only (spill, leak, fire, exposure or accident)
call CHEMTREC at: 800-424-9300 within the USA and Canada
+1 703-527-3887 outside the USA and Canada
Non-emergency calls cannot be serviced at this number.

2. Hazards Identification

The rechargeable lithium-ion batteries described in this Product Safety Data Sheet are sealed units which are not hazardous when used according to the recommendations of the manufacturer and as long as their integrity is maintained.
Do not short circuit, puncture, incinerate, crush, immerse in water, force discharge or expose to temperatures above the declared operating temperature range of the product. Risk of fire or explosion.
Under normal conditions of use, the active materials and liquid electrolyte contained in the cells and batteries are not exposed to the outside, provided the battery integrity is maintained and seals remain intact. Risk of exposure only in case of abuse (mechanical, thermal, electrical) which leads to the activation of safety valves and/or the rupture of the battery container. Electrolyte leakage, electrode materials reaction with moisture/water or battery vent/explosion/fire may follow, depending upon the circumstances.

3. Composition and Informations on Ingredients

Each cell consists of a hermetically sealed metallic container containing a number of chemicals and materials of construction of which the following could potentially be hazardous upon release.

Ingredient	Content	CAS No.	Hazard Symbols	Classification	R Phrases
metall oxide compounds (propietary) e.g. Li-Ni, Li-Mn, Li-Co, Li-FePo	20 - 50%				
Organic Solvents	10 - 20%				
EA (Ethyl-Acetate)		141-78-6		Xi, F	11, 36, 66, 67
EC (Ethylene Carbonate)		96-49-1		Xi	41
DMC (Di Methyl Carbonate		616-38-6		F	11
EMC (Ethyl Methyl Carb.)		623-53-0		Xi	10, 36, 37, 38
DEC (Diethylcarbonate)		105-58-8			10
Lithium-Hexa-Fluoro Phosphate ($LiPF_6$)	1 - 3%	21324-40-3		T	22, 24 34
Polyvinylidene Fluoride (PVDF)	< 5%	24937-79-9	n/a	n/a	n/a
Styrene Butadiene Rubber (SBR)	< 5%	9003-55-8			
Copper (Cu)	2 - 11%	7440-50-8		F (powder)	11
Aluminium (Al)	2 - 10%	7429-90-5		F (powder)	10-15
Carbon (C) (Graphite)	10 - 30%	7440-44-0	n/a	n/a	n/a
stainless steel	25 - 35%	n/a	n/a	n/a	n/a

4. First Aid Measures

In case of accumulator breakage or burst, please evacuate employees from the contaminated area and ensure maximal ventilation in order to break-up corrosive gas, smoke and unpleasant odors.
If it occurs, by accident, following measures must be taken:

Inhalation — Remove from exposure, rest and keep warm.
In severe cases obtain medical attention.

Skin Contact — Wash off skin thoroughly with water. Remove contaminated clothing and wash before re-use. In severe cases obtain medical attention.

Eye Contact — Irrigate thoroughly with water for at least 15 minutes.
Obtain medical attention.

Ingestion — Wash out mouth thoroughly with water and give plenty of water to drink.
Obtain medical attention.

Further treatment — All cases of eye contamination, persistent skin irritation and casualities who have swallowed this substance or been affected by breathing its vapours should be seen by a doctor.

5. Fire Fighting Measures

Suitable extinguishing media:	Dry powder is applicable for burning lithium ion batteries. Metal fire extinction powder, rock salt or dry sand are suitable if only a few batteries are involved.
Extinguishing media with limited suitability:	Carbon dioxide (CO_2) is only applicable for incipient fire. Do not use water.
Special protection equipment during fire-fighting:	Contamination cloth including self-contained breathing apparatus.
Special hazard:	Cells may explode and release metal parts. At contact of electrolyte with water traces of hydrofluoric acid may be formed. In this case avoid contact and take care for good ventilation. At contact of changed anode material with water extremely flammable hydrogen gas is generated.
Attention:	Do not let used extinguishing media penetrate into surface water or ground water. If necessary, thicken water or foam with suitable solids. Dispose off properly.

6. Accidental Release Measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, face protection, breathing protection).
Environmental protection measures:	Bind released ingredients with powder (rock salt, sand). Dispose off according to the local law and rules. Avoid leached substances to penetrate into the earth, canalization or water.
Treatment for cleaning:	If battery casing is dismantled, small amounts of electrolyte may leak. Package the battery tightly including ingredients together with lime, sand or rock salt. Then clean with water.

7. Precautions for safe Handling and Use

Storage:	Store in a cool (preferable below 30°C), well ventilated area, away from moisture, sources of heat, open flames, food and drink. Elevated temperatures can result in shortened battery life. Temperautes above 70°C may result in battery leakage and rupture. Keep adequate clearance between walls and batteries. Since short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them. Preferred storage at 50% of nominal battery capacity. A fire alarm is recommended in case of storage of large amounts.
Handling:	Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e. metal) goods, which would end up into excessive heating. Do not directly heat or solder. Do not throw batteries into fire or water. Do not mix batteries of different types and brands. Do not mix new and used batteries. Keep batteries in non conductive (i.e. plastic) trays. Do not disassemble, mutilate or mechanically abuse cells and batteries. Avoid deep discharge. Follow manufacturers recommendations regarding maximum recommended currents and operating temperature range.
Other:	Applying pressure on deforming the battery may lead to disassembly followed by eye, skin and throat irritation. The Li-ion cells and batteries are not designed to be recharged from external power sources besides specific Li-ion charger models approved by Ansmann. Connecting to inappropriate power supplies can result in fire or explosion.
Disposal:	Dispose in accordance with all applicable federal, state and local regulations.

8. Special Protection Information

Ventilation Requirements: Not necessary under normal conditions. Room ventilation may be required in areas where there are open or leaking batteries.



Respiratory Protection: Not necessary under normal conditions. Avoid exposure to electrolyte fumes from open or leaking battery. In all fire situations, use self-contained breathing apparatus



Eye Protection: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.



Hand Protection: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery

9. Physical and Chemical Properties

Note: The following points are not applicable unless in case of leaking or damaged batteries with exposed internal components.

Appearance: Cylindrical or prismatic shape

Odour: Odourless (unless in case of damaged product with leaking electrolyte)

Flashpoint: Not applicable

Flammability: Not applicable

Relative density: > 2 g/cm3

Solubility (water): Not applicable unless individual components exposed

Solubility (other): Not applicable

10. Stability and Reactivity

Product is stable under conditions described in Section 7.

Conditions to avoid: Heat above 70° or incinerate. Deform. Mutilate. Crush. Pierce. Disassemble. Short circuit. Expose over a long period to humid conditions.

Materials to avoid: Strong mineral acids, alkali solutions, strong oxidising materials and conductive materials

Hazardous decomposition products: HF, CO, CO2

11. Toxicological Information

Signs & symptoms: None, unless battery ruptures. In the event of exposure to internal contents, corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Inhalation: Lung irritant

Skin contact: Skin irritant

Eye contact: Eye irritant

Ingestion: Tissue damage to throat and gastro-respiratory tract if swallowed

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, eczema, skin allergies, lung injuries, asthma and other respiratory disorders may occure.

12. Ecological Information

Ansmann lithium ion batteries do not contain heavy metals as defined by the European directives 2006/66/EC Article 21.

Mercury has not been "intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)" in the sense of the U.S.A. "Mercury-Containing and Rechargeable Battery Management Act" (May 13, 1996)

The Regulation on MercuryContent Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines 'low mercury' as 'mercury content by weight in battery as less than 0.025%', and 'mercury free' as mercury content by weight in battery as less than 0.0001%'. And therefore: Ansmann lithium ion batteries belong to the category mercury-free battery (mercury content lower than 0.0001%).

13. Disposal Considerations

USA: Lithium-Ion batteries are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by the Rechargeable Battery Recycling Corporation's (RPBC) Battery Recycling Program. Please go to the RPBC website at www.rbrc.org (www.call2recycle.org) for additional information.

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (http://www.epbaeurope.net/legislation_national.html)

Importers and users outside EU should consider the local law and rules

In order to avoid short circuit and heating, used lithium ion batteries should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals
- Embedding in dry sand

14. Transport Information

ADR

UN-Number:	3480
description	Lithium ion batteries
class:	9
packaging order:	P903
special provision:	188; 230; 310; 348; 376; 377; 636
tunnel forbitten code:	E
UN-Number:	3481
description	Lithium ion batteries contained in equipment / packed with equipment
class:	9
packaging order:	P903
special provision:	188; 230; 348; 360; 367; 377; 636
tunnel forbitten code:	E

IATA

UN-Number:	3480
description	Lithium ion batteries
class:	9
packaging order:	965
section:	II, IB,IA
special provision:	A88; A99; A154; A164; A183

UN-Number:	3481
description	Lithium ion batteries contained in equipment
class:	9
packaging order:	967
section:	II, I
special provision:	A48; A99; A154; A164; A181; A185
UN-Number:	3481
description	Lithium ion batteries packed with equipment
class:	9
packaging order:	966
section:	II, I
special provision:	A88; A99; A154; A164; A181; A185

IMDG-Code

UN-Number:	3480
description	Lithium ion batteries
class:	9
packaging order:	P903
special provision:	188; 230; 310; 348; 376; 377
UN-Number:	3481
description	Lithium ion batteries contained in equipment / packed with equipment
class:	9
packaging order:	P903
special provision:	188; 230; 348; 360; 376; 377

Since 1st of January 2013 it is necessary to produce both, lithium cells and lithium batteries under an existing quality assurance program.
The quality assurance program is detailed in following parts of the international dangerous goods laws:

- ADR (2015): 2.2.9.1.7 (e)
- IATA (57th edition): 3.9.2.6 (e)
- IMDG-Code (Amendment 37-14): 2.9.4 (5.)

Ansmann hereby declare that all lithium cells and batteries of the Ansmann product range are produced according the above named quality assurance program.

15. Regulatory Information

Regulations specifically applicable to the product:
- ACGIH and OSHA: see exposure limits of the internal ingredients of the battery in section 3.
- IATA/ICAO (air transportation): UN 3480 or UN 3481
- Transportation within the US-DOT, 49 Code of Federal Regulations (special provision 188
- IMDG (sea transportation) : UN 3480 or UN 3481(special provision 188, 230)

16. Other Information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.
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