



Material - Safety - Data Sheet (MSDS)

for
Ansmann Lead Acid Batteries
Valve Regulated

No.6

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1. Product and Supplier Identification

Product name: VRLA Battery
Type: Valve Regulated Lead Acid (VRLA) Battery
Models / types: Prismatic cells
Electrochemical system: Lead acid
Proper shipping name: Battery, wet, sealed, maintenance free, non-spillable

Supplier:
Germany: ANSMANN AG
Address: Industriestraße 10; 97959 Assamstadt; Germany
Phone / Fax: + 49 (0) 6294 42040 / + 49 (0) 6294 420444
Home / email: ansmann.de / info@ansmann.de

Subsidiaries:

United Kingdom: ANSMANN UK LTD.
Address: Units 11-20, RO24, Harlow Business Park, Harlow, Essex. CM19 5QB. UK
Phone / Facsimile: +44 (0) 870 609 2233 / +44 (0) 870609 2234
email: UK@ansmann.de

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 (spill, leak, fire, exposure or accident)
call phone no.: +49 6294 4204 0

2. Hazards Identification

The rechargeable lead acid 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, 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 opening of the valves and/or the rupture of the battery container. Electrolyte leakage or battery vent/explosion/fire may follow, depending upon the circumstances.



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3. Composition and Informations on Ingredients

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

Ingredient	Content (%)	CAS No.	OSHA (PEL)	ACGIH (TLV)	Risk Phrases
Lead (Pb)	40 - 60	7439-92-1	0.05mg/m ³	0.15mg/m ³	R23, R25
Lead Dioxide (PbO ₂)	20 - 30	1309-60-0	0.05mg/m ³	0.15mg/m ³	R23, R24, R25
Barium Comp. (Ba)	< 1.5	7440-39-3	0.5mg/m ³	0.5mg/m ³	R23, R24, R25
Tin (Sn)	0 - 2	7440-31-5	2mg/m ³	2mg/m ³	R23, R25
Calcium (Ca)	< 0.2	7440-70-2	-	-	R23, R25
Arsenic (As)	< 0.2	7440-38-2	0.01mg/m ³	0.2mg/m ³	
Electrolyte (Sulfuric acid -water solution) H ₂ SO ₄	10 - 40	7664-93-9	1mg/m ³	1mg/m ³	R21, R22, R35, R36 R37, R38, R49
Fibre Glass	2 - 6		n/a	n/a	
Polypropylene	0 - 10	9003-07-0	n/a	n/a	
Polyethylene	0 - 10	9002-88-4	n/a	n/a	
Acrylonitrile Butadiene Styrene (ABS)	0 - 10	9003-56-9	n/a	n/a	
Antimony (Sb)	0 - 5	7440-36-0	0.5mg/m ³	0.5mg/m ³	

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 odours.

If it occurs, by accident, following measures must be taken:

- Basically:** If people get in contact with harmful battery components; SPEED is essential. Immediate medical attention is strongly recommended.
- Inhalation:** Provide fresh air or in severe cases medical oxygen/CPR if needed. If breathing difficulty or discomfort occurs and persists seek a medical doctor. If breathing has stopped, give artificial respiration and see medical doctor immediately.
- 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. Lifting upper and lower lids, until no evidence of the chemical remains. Obtain medical attention.
- Ingestion:** Wash out mouth thoroughly with water. Do not induce vomiting or give food or drink. Seek medical attention immediately.
- Further treatment:** All cases of eye contamination, persistent skin irritation and casualties who have swallowed this substance or been affected by breathing its vapours should be seen by a doctor.



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5. Fire Fighting Measures

VRLA batteries emit hydrogen gas which is flammable and will form explosive mixtures in air from 4% to 76%. This can be ignited by a spark at any voltage, naked flames or other sources of ignition.

Batteries in use will be a part of an electrical circuit and must be isolated from the power source before attempting to put out a fire. Switch the power OFF before disconnecting the batteries from the power source.

Damaged batteries may expose negative plates (grey) colour, which may ignite if allowed to dry out. These plates may be wetted down with water after the battery has been removed from all electrical circuits.

Suitable extinguisher types: CO₂; Foam; Dry Powder

Unsuitable extinguisher types: Water extinguisher must never be used to put out an electrical fire

Hazardous decomposition products: Carbon monoxide, Sulphur dioxide, Sulphur trioxide, lead fume and vapour, toxic fumes from decomposition of battery case materials

Special protective equipment for the fire fighters: Full face visor or safety goggles; respiratory protective equipment or self-contained breathing apparatus; full acid resistant protective clothing must be worn in fire fighting conditions.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel protective equipment: Wear chemical gloves

For emergency responders protective equipment: Wear chemical gloves, goggles, acid resistant clothing and boots, respirator if insufficient ventilation

Environmental precautions: Prevent entry into waterways, sewers, basements or confined areas. Runoff from fire control and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

Methods and material for containment and cleaning up for containment: In the event of a battery rupturing; stop the leak if you can do it without risk. Absorb with earth, sand or other non-combustible material. Cautiously neutralize spilled liquid.

For cleaning up: Dispose of in accordance with local, State, and national regulations.

7. Precautions for safe Handling and Use

Storage: Store in a cool (preferable below 25°C), well ventilated area, away from moisture, sources of heat, and open flames. Batteries should be stored under roof for protection against adverse weather conditions. Place cardboard between layers of stacked batteries to avoid damage and short circuits. Store batteries on an impervious surface. Storage class: Class 8B; non-flammable corrosive materials

Handling: Handle batteries cautiously. Do not tip to avoid spills (if filled with electrolyte). Avoid contact with internal components. Wear protective clothing when filling or handling batteries. Follow manufacturer's instructions for installation and service. Do not allow conductive material to touch the battery terminals. Short circuit may occur and cause battery failure and fire. Wash hands thoroughly with soap and water after handling and before eating, drinking or using tobacco.

Charging: This battery is made to be charged many times. Use only specified charger. Follow manufacturer data in respect of charge current and charge time. Note correct polarity. Improper charging can cause heat damage or even high pressure rupture.

Disposal: Dispose in accordance with all applicable federal, state and local regulations.






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8. Special Protection Information / Control Measures

- 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

	Appearance	Specific Gravity (g/cm ³)	Solubility in water	Melting Point	Odour
Lead	silver-gray metal	11.34	n/a	327.4°C	n/a
Lead sulphate	white powder	6.32	40mg/l	1000°C	n/a
Lead dioxide	brown powder	9.37	n/a	289°C	n/a
Sulphuric acid	clear liquid	1.225 - 1.300	100%	114°C	acidic
Glass separator	white fibrous glass	135-175	n/a	>900°C	n/a
Plastic (ABS)	solid plastic	1.05	n/a	220°C	n/a
PP Separator	solid plastic	1.05	n/a	150°C	n/a

10. Stability and Reactivity

- Reactivity:** Not reactive
- Chemical stability:** Stable under normal temperatures and pressures
- Possibility of hazardous reactions:** Hazardous polymerization will not occur.
- Conditions to avoid:** Prolonged overcharge; Sources of ignition
- Incompatible materials:**
Sulfuric acid: Contact with combustible and organic materials may cause fire and explosions. Also reacts violently with strong reducing agents, metals sulfur trioxide, strong oxidizers and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Lead compounds: Avoid contact with strong bases, acids, combustible organic materials, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, reducing agents and water.
- Hazardous decomposition products:** Lead compounds exposed to high temperatures will likely produce toxic metal fume, vapor or dust; contact with stron acid/base or presence of nascent hydrogen may generate highly toxic arsine gas.
Sulfuric acid: Sulfur trioxide, carbon monoxide, sulfuric acid, sulfur dioxide and hydrogen.




11. Toxicological Information

Information on toxicological effects

Lead 7439-92-1	Effect dose / Concentration	Species	Method	Time
Acute oral toxicity	155mg/kg	Human	LDLo	
Acute oral toxicity	1050µg/kg	Rat	TDLo	30 Weeks (int.)
Acute inhalative toxicity(dust/m	0.011mg/m ³	Human	LCLo	26 Weeks (int.)
Mutagen	23µg/m ³	Rat	Inhalation	16 Weeks
Reproductive	790mg/kg	Rat	TDLo (Oral)	
Reproductive	3mg/m ³	Rat	TCLo (Inhalation)	1-21 Days preg.
Sulphuric Acid 7664-93-9	Effect dose / Concentration	Species	Method	Time
Acute oral toxicity	2140mg/kg	Rat	LD50	
Acute inhalative toxicity(vapor)	30mg/m ³	Guinea Pig	LCLo	7 Days (cont.)
Acute inhalative toxicity(vapor)	510mg/m ³	Rat	LC50	2 Hours
Acute inhalative toxicity(vapor)	3mg/m ³	Human	LCLo	24 Weeks
Irritation	5mg	Rabbit	SEV (eye)	30 Second rinse
Irritation	250µg	Rabbit	SEV (eye)	
Antimony 7440-36-0	Effect dose / Concentration	Species	Method	Time
Acute oral toxicity	100mg/kg	Rat	LD50	
Acute inhalative toxicity(dust/m	13.5mg/m ³	Human	LCLo	4 Hours
Tumorigen/Carcinogen	50mg/m ³	Rat	TCLo	7 hours 52 Weeks (int.)

12. Ecological Information

This information does not apply to the undamaged VRLA battery. It is of relevance if the battery is broken and the components are released to the environment.

Components		
Plate grids and active materials:	Metallic lead, lead alloys and lead dioxide	Chemical and physical treatment is required for the elimination of lead from water. Waste water containing lead must not be disposed of in an untreated condition.
	Ecotoxicity:  Risk Phrase R52/53	The general classification for lead compounds , R50/53 does not apply to battery lead oxide. Tests in 2001 and 2005 have concluded that battery lead oxide is not toxic for the environment; neither R50 nor R50/53 nor R51/53. Risk phrase 52/53 (harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment) applies to battery lead oxide.
	Effect in the aquatic environment: 	Toxicity for fish: 96h LC 50 > 100mg/l Toxicity for daphnia: 48h EC 50 > 100mg/l Toxicity for alga: 72h IC 50 > 10mg/l
Battery electrolyte:	Ecotoxicity: 	In order to avoid damage to the sewerage system, the acid has to be neutralized by means of soda ash, sodium carbonate before disposal Ecological damage is possible by change of pH. The electrolyte solution reacts with water and organic substances causing damage to flora and fauna. The electrolyte may also contain components of lead that can be toxic to aquatic environments.
	Persistence and Degradation	Remains indefinitely in the environment as sulphate



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Case material:	Elimination information:	No data available: insoluble in water
	Behaviour and environmental fate:	Due to consistency of the product, and its insolubility in water, it will apparently not be bio-available.
Separator material:		No data available: insoluble in water Not thought to pose any risk to the environment.

13. Disposal Considerations

Components		
VRLA Battery	Europe:	Spent VRLA batteries are subject to the requirements of the Batteries Directive 2006/66/EC (on batteries and accumulators and waste batteries and accumulators). Spent VRLA batteries must be sent for recycling through an authorized contractor. The WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment) applies. Spent VRLA batteries must be removed from equipment at end-of-life.
	Worldwide:	VRLA batteries contain inorganic lead components and sulphuric acid which are damaging to the environment. Spent batteries must be disposed of in an environmentally friendly manner in accordance with local national laws and regulations.
Plate grids and active materials:		Metallic lead and active materials (lead oxides) must be recycled. Disposal must be carried out in accordance with the European Hazardous Waste Directive 91/689/EEC (until end of 2010), then Directive 2008/98/EC
Battery electrolyte:	Europe:	Disposal must be carried out in accordance with the European Hazardous Waste Directive 91/689/EEC (until end of 2010). Thereafter, Directive 2008/98/EC on the protection of the environment through criminal law.
	Worldwide:	Disposal should be in accordance with local, state or national legislation.

14. Transport Information

Components		
VRLA battery	Land transport: <u>RID</u> <u>ADR</u>	Ansmann VRLA batteries are not subject to the requirements of ADR as, at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if, as packaged for carriage, the terminals are protected from short circuit. UN no.: UN2800 Hazard Class: 8 Proper shipping name: Batteries, wet, non-spillable Classification Code: C11 Special Provisions: 238, 295, 598
	Sea transport: <u>IMDG</u>	Ansmann VRLA batteries have been tested and meet the non-spillable criteria listed in IMDG Code Special Provision 238.1 and 2. Therefore, these batteries are not subject to the provisions of the IMDG code, provided that the battery terminals are protected against short circuits when packaged for transport. UN no.: UN2800 Hazard Class: 8 Proper shipping name: Batteries, wet, non-spillable Packing group: III Special Provisions: 29, 238



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	Air transport: <u>IATA</u> <u>ICAO</u>	Ansmann VRLA batteries have been tested and meet the non-spillable criteria listed in IATA Packing Instruction 872 and Special Provision A67. These batteries are excepted from all IATA regulations provided that the battery terminals are protected against short circuits. The words "Not Restricted , as per Special Provision A67" must be included the description on the Air Waybill. UN no.: UN2800 Hazard Class: 8 Proper shipping name: Batteries, wet, non-spillable Packing group: III Special Provisions: A48 A67, A164, A183
	All methods of transport	Do not place VRLA batteries inside sealed enclosures. VRLA batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approx. 4% to 76%. This can be ignited by a spark at any voltage, naked flames or other sources of ignition.

16. Regulatory Information

Required Markings:



Crossed-out wheeled bin indicating "Separate Collection" for all batteries and accumulators. Not to be disposed of with general domestic, commercial or industrial waste.

Reference: The Batteries Directive 2006/66/EC

Pb

The Pb symbol indicates the heavy metal content of the battery and enables the lead-acid battery to be sorted for recycling.

Reference: The Batteries Directive 2006/66/EC



The international recycling symbol , required by law in many countries world-wide to facilitate the identification of secondary batteries and accumulators for recycling.

Reference: IEC61429; 1995; Marking of secondary cells and batteries with the international recycling symbol ISO 7000-1135

16. Other Information

To ensure the safe use of VRLA batteries supplied by Ansmann AG, the following precautions must be observed:

Only trained, competent personnel, who received special instructions for the hazards and risks, should be allowed to handle VRLA batteries.

Never short-circuit battery terminals, since sparks and arcs produced can injure personnel and are a fire and explosion hazard.

VRLA batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approx. 4% to 76%. Never install VRLA batteries in gas-tight enclosure, whether during storage, transport or usage.

Batteries must always be charged on a voltage-regulated charging system with adequate ventilation provided to avoid the build-up of ignitable gases and to promote good heat dissipation.

Do not charge VRLA batteries above +50°C, discharge or store above +60°C.

Risk phrases:	R21 Harmful in contact with skin	R35 Causes severe burns
	R22 Harmfull if swallowed	R36 Irritating to eyes
	R23 Toxic by inhalation	R37 Irritating to respiratory system
	R24 Toxic in contact with skin	R38 Irritating to skin
	R25 Toxic if swallowed	R49 May cause cancer by inhalation

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