

Instructions for the safe handling of lead-acid accumulators (lead-acid batteries)

Source: ZVEI information leaflet No. 1e / October 2018



For articles – like lead-acid batteries – safety data sheets are not required.

1. Substances / formulation and company name

Data on the product trade name	Lead-acid battery, filled or fillable with diluted sulphuric acid
Data on the manufacturer	MOLL Batterien GmbH Angerstr. 50 96231 Bad Staffelstein - GERMANY Tel. +49 (0) 95 73 / 96 22 – 0 Fax +49 (0) 95 73 / 96 22 – 11 info@moll-batterien.de

2. Hazardous identification

No hazards in case of an intact battery and observation of the instruction for use. Lead-acid batteries have significant characteristics:

- They contain diluted sulphuric acid, which may cause severe acid burns.
- During the charging process they develop hydrogen gas and oxygen, which under certain circumstances may turn into an explosive mixture.
- They have an internal voltage, which – depending on their level – can be dangerous to the human body when touched.

Standard EN 50272-2 includes safety battery installations and describes the basic precautions to protect against dangers deriving from electric currents, leaking gases or electrolytes.

3. Composition / information on ingredients

CAS-No.	Description	Content	H-phrases
7439- 92-1	lead, alloys with traces of As, Sb	29 weight %	H360, H362, H332, H302, H372, H351
7439- 92-1	lead-containing battery paste	29 weight %	H360D, H302, H332, H361f, H412 H290,
7664- 93-9	sulphuric acid	33 weight %	H314
9003- 07-0	polypropylene (case material)	7 weight %	

Note: Lead is included in the candidate list of substances of very high concern (SVHC). Lead batteries contain lead in concentrations above 0.1%, therefore a SCIP notification is required.

MOLL lead-acid-batteries: SCIP-Number: 18a3d492-33be-4c78-8936-e2368c99e576

Batteries are marked with the following hazard symbols¹⁾:

	Nicht rauchen, keine offenen Flammen, keine Funken No smoking, no naked flames, no sparks		Korrosiv (Batteriesäure) Corrosive (battery acid)
	Schutzbrille tragen Shield eyes		Bedienungsanleitung beachten Note operating instructions
	Kinder fernhalten Keep away from children's reach		Explosives Gasegemisch Explosive gas

¹⁾ The hazard symbols on the left side correspond to ISO 7010. The hazard symbols on the right side correspond to the European industry standard EN 50342-1 for starter batteries. In dependence of the respective normative background the hazard symbols shown here are suitable to fulfil the safety-related requirements. A marking of batteries after GHS CLP-regulation is not required.

4. First aid measures

General Information:

Sulphuric acid	acts corrosive and damages tissue
+ after contact with skin after	rinse with water, remove and wash wetted clothing
+ inhalation of acid mist ¹⁾ after	inhale fresh air
+ contact with the eyes ²⁾ after	rinse under running water for several minutes
+ swallowing ²⁾	drink a lot of water immediately, and swallow activated carbon
Lead-containing battery paste	classified as toxic for reproduction
+ after contact with skin	clean with water and soap

²⁾ seek the advice of a doctor

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5. Firefighting measures

- Suitable extinguishing agents** When electrical devices are set in fire in general water is the suitable extinguishing agent. For incipient fires CO₂ is the most effective agent. Fire brigades are trained to keep a distance of 1m when extinguishing an electrical fire (up to 1kV) with spray jet and a distance of 5 m with full jet. For electrical fires in electrical installations with voltages > 1 kV other distances are applicable depending on the respective voltage. For fires in photovoltaic installations other rules apply.
- Unsuitable extinguishing agents** Powder fire extinguishers are not suitable, amongst others because of only minor efficiency, possible risks or collateral damages.
- Special protective equipment** For larger stationary battery installations or larger stored quantities: protective goggles, respiratory and acid protective equipment, acid-proof clothing.

6. Accidental release measures

Cleaning / take-up procedures


Use a bonding agent, such as sand, to absorb split acid; Use lime / sodium carbonate for neutralisation; dispose with due regard to the official local regulations, do not permit penetration into the sewage system, the earth or water bodies.

7. Handling and storage

- Store frost-free under roof; prevent short circuits.
- Protect plastic housings against exposition to direct sun radiation.
- Seek agreement with local water authorities in case of larger quantities.
- If batteries have to be stored in storage rooms, it is imperative that the instructions for use are observed

8. Exposure controls / personal protection

- **No exposure caused by lead and lead-containing battery paste.**
- **Possible exposure caused by sulphuric acid and acid mist during filling and charging.**

Substance	sulphuric acid
CAS-No.	7664-93-9
H-phrases	
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
P-phrases	
P280	Wear protection gloves/protective clothing/eye protection/face protection IF
P301+P330+P331	SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
Threshold value	0,1 mg/m ³ (E) on workplace
Hazard symbol	corrosive 
Personal protection equipment	Rubber-, PVC-gloves, acid-proof goggles, acid-proof clothing, safety boots

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9. Physical and chemical properties

Lead		Sulphuric acid (30 – 38,5 %)	
Appearance:		Appearance:	
form:	solid	form:	liquid
colour:	grey	colour:	colourless
odour:	odourless	odour:	odourless
Safety-related data:		Safety-related data:	
Solidification point:	327 °C	Solidification point:	– 35 to – 60°C ca.
Boiling point:	1740 °C	Boiling point:	108 – 114 °C
Solubility in water		Solubility in water	
(25 °C): density (20°C):	low (0,15 mg/l) 11,35 g/cm ³	(25 °C): density (20 °C):	complete 1,2 – 1,3 g/ cm ³

10. Stability and reactivity of the sulphuric acid (30 to 38,5%)

Corrosive, inflammable liquid.

- Thermal decomposition at 338 °C.
- Destroys organic materials such as cardboard, wood, textiles.
- Reacts with metals producing hydrogen.
- Vigorous reactions with lyes and alkalis.

11. Toxicological information

Sulphuric acid

Acts intensely corrosive on skin and mucous membranes. The inhalations of mists may cause damage to the respiratory tract.

Lead and lead-containing battery paste

May cause damage to the blood, nerves, and kidneys when taken in. Lead-containing battery paste is classified as toxic for reproduction.

12. Environment-related issues

Preliminary remark: Relevant only if release is caused by destruction of the battery.

Sulphuric acid

Water-polluting liquid within the meaning of the German Water-Resources Act (WHG) Water pollution class: 1 (mildly water polluting) As described in section 6 use a bonding agent, such as sand, to absorb spilled acid or neutralise using lime / sodium carbonate. Dispose of under the locally applicable provisions, Dispose with due regard to official local regulations.

Do not allow progression into the sewage system, soil or bodies of water.

Lead and lead-containing battery paste

Are hardly soluble in water.

Lead can be dissolved in an acidic or alkaline environment. Chemical and physical treatment is required for elimination from water. Waste water containing lead must not be disposed of in untreated condition.

13. Disposal considerations

The points of sale, the manufacturers and importers of batteries, respectively the metal dealers take back dead batteries, and render them to the secondary lead smelters for processing.

Spent lead-acid batteries are not subject to accountability of the German Waste Prove Ordinance. They are marked with the recycling / return symbol and with a crossed-out roller container (cf. chapter 15 "Marking").

Spent lead-acid batteries are not allowed to be mixed with other batteries in order not to compliance the processing.

By no means may the electrolyte, the diluted sulphuric acid, be emptied in an inexpert manner. This process is to be carried out by the processing companies.

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14. Transport information

14.1 Batteries, wet, filled with acid Land transportation according to ADR/RID

Special Provision 598: no transport as dangerous goods (new + spent batteries are not subject to other requirements of ADR/RID if they meet the requirements according to Special Provision 598):

New storage batteries when:

- They are secured in such a way that they cannot slip, fall or be damaged;
- They are provided with carrying devices, unless they are suitably stacked, e.g. on pallets;
- There are no dangerous traces of alkalis or acids on the outside;
- They are protected against short circuit;

Used batteries when:

- Their cases are undamaged;
- They are secured in such a way that they cannot leak, slip, fall or be damaged, e.g. by stacking on pallets;
- There are no dangerous traces of alkalis or acids on the outside of the article;
- They are protected against short circuits;

If the requirements of Special Provision 598 are not fulfilled the transport of new and spent batteries has to be

- declared as dangerous goods as follows:

- Hazard class: 8
- UN-no.: 2794
- Naming and description: BATTERIES, WET, FILLED WITH ACID
- Packing group: none
- Hazard label: 8
- ADR Tunnel restriction code: E

Sea transportation according to IMDG Code

- Hazard class: 8
- UN-no.: 2794
- Proper shipping name: BATTERIES, WET, FILLED WITH ACID
- Packaging group: none
- EmS: F-A, S-B
- Packaging Instruction: P 801
- Hazard label: 8

Air transportation according to IATA-DGR

- Class: 8
- UN-no.: 2794
- Proper shipping name: BATTERIES, WET, FILLED WITH ACID
- Hazard class: 8
- Packaging Instruction: 870

14.2 Batteries, wet, non-spillable Land transportation according to ADR/RID

- UN-no.: 2800
- Proper shipping name: BATTERIES, WET, NON-SPILLABLE
- Packing group: none
- Packaging Instruction: P 003
- Hazard label: 8
- Special Provision 238 para. a) + b): no transport as dangerous goods (non-spillable batteries are not subject to other requirements of ADR/RID if they meet the requirements according to special provision 238. An appropriate manufacturer's confirmation is necessary. Batteries which do not meet the requirements according to Special Provision 238 have to be packed and carried as listed in 14.1 Land transportation ADR/RID according to Special Provision 598.)

Sea transportation according to IMDG Code

- Hazard class: 8
- UN-no.: 2800
- Proper shipping name: BATTERIES, WET, NON-SPILLABLE
- Packing group: none
- Packaging Instructions: P 003 and PP 16
- Hazard label: 8
- EmS: F-A, S-B
- Special Provision 238 no. 1 + 2: no transport as dangerous goods (non-spillable batteries are not subject to other requirements of IMDG Code if they meet the requirements according to Special Provision 238. An appropriate manufacturer's confirmation is necessary. Batteries which do not meet the requirements according to Special Provision 238 have to be packed as listed in 14.1 Sea transportation IMDG Code according to Packaging Instruction P 801 and carried as dangerous goods according to UN 2794.)

Air transportation according to IATA DGR

- Hazard class: 8
- UN-no.: 2800
- Proper shipping name: BATTERIES, WET, NON-SPILLABLE

- Packing group: none
- Packaging Instruction: 872
- Hazard label: 8
- Special Provision A 67: no transport as dangerous goods (non-spillable batteries are not subject to other requirements of IATA DGR if they meet the requirements of Special Provision A 67. Provided that poles are secured against short-circuit. An appropriate manufacturer's confirmation is necessary. Batteries which do not meet the requirements according to Special Provision A 67 have to be packed as listed in 14.1 Air transportation IATA-DGR according to Packaging Instruction 870 and carried as dangerous goods according to UN 2794.)

14.3 Batteries, damaged

Land transportation according to ADR/RID

- Hazard class: 8
- UN-no.: 2794
- Proper shipping name: WASTE, BATTERIES, WET, FILLED WITH ACID, ENVIRONMENTALLY HAZARDOUS
- Packing group: none
- Transport as dangerous goods considering:
 - Packing Instruction P 801 a: packing in accu boxes or
 - Special Provisions VC1, VC2, AP8: in bulk
 - Hazard label: 8
 - ADR Tunnel restriction code: E

Note: These references can be applied by transportation of Lead-acid batteries of UN-no. 2800 as well.

14.4 Batteries, dry, no electrolyte added

Land transportation (road/rail) according to ADR/RID

- Not regulated as a hazardous material.

See transportation according to IMDG code

- Not regulated as a hazardous material.

Air transportation according to IATA DGR

- Not regulated as a hazardous material.
- Special provision A123 has to be adhered to.

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15. Regulatory information

All types of batteries and accumulators, regardless of their shape, volume, weight, material composition or use are governed by the European battery directive (2006/66/EG). It contains rules regarding the placing on the market, collection, treatment, recycling and disposal of waste batteries and accumulators. Furthermore all lead-acid batteries have to be marked with a crossed-out wheelee bin and with the chemical symbol for lead Pb shown below.



In addition, the ISO-recycling symbol is marked.



The manufacturer, respectively the importer of the batteries shall be responsible for the attachment of the symbols. In addition, a consumer / user information on the significance of the symbols has to be attached. The manufactures and sellers of the batteries subject to identification requirements (packaging, technical instructions, leaflets) shall be responsible for this information.

16. Other information

The data rendered above are based on today's knowledge, and do not constitute an assurance op properties. Existing laws and regulations have to be observed by the recipient pf the product in own responsibility.