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

The REACH-regulation (1907/2006/EC) describes the setting up and updating of safety data sheets for substances and mixtures. For articles-like lead-acid batteries- safety data sheets are not required.

1. Identification of the substance/mixture and of the company/undertaking

SUN Battery

Lead-acid battery, filled with dilute sulfuric acid

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2. Hazards identification

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

Lead-acid batteries have significant characteristics:

- They contain diluted sulphuric acid, which may cause several 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 requirements for batteries and 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	blue lead, lead alloys with traces of As, Sb	32 weight%	H360, H362, H332, H302, H372, H351
-	lead-containing Battery paste	32 weight%	H360D, H302, H332, H361f, H412
7664-93-9	sulphuric acid	29 weight%	H290, H314
-	plastic case	7 weight%	

Batteries are marked with the following hazard symbols 1)





No smoking, no naked flames, no sparks





Shield eyes





Corrosive (Battery acid)





Note operating instructions





Explosive gas

Safety sign P036 (ISO 7010) purchase e.g. at Beuth-Verlag



Keep away from children's reach

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 fulfill 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 rinse with water, remove and wash wetted clothing

after inhalation of acid mist²⁾ inhale fresh air

after contact with the eyes²⁾ rinse under running water for several minutes

after swallowing²⁾ 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

5. Firefighting measures

Suitable extinguishing agents:

When electrical devices are set on fire in general water and foam are suitable extinguishing agents. For incipient fires CO_2 is the most effective agent. Fire brigades are trained to keep a distance of 1 m when extinguishing an electrical fire (up to 1 kV) 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.

²⁾ Seek the advice of a doctor





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 because gases can be formed during battery loading.

8. Exposure controls/ personal protection

8.1 No exposure caused by lead and lead-containing battery paste.

8.2 Possible exposure caused by sulphuric acid and acid mist during filling and charging.

Substance	sulphuric acid		
CAS-Nr.	7664-93-9		
H-phrases			
H290	May be corrosive to metals		
H314	Causes severe skin burns and eye damage.		
P-phrases			
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.		
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.		
P303 + P361	IF ON SKIN (or hair):		
+ P353	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 is present and easy to do- continue rinsing.		

Threshold value on workplace: 0,1 mg/m³



Hazard symbol

corrosive





Personal Rubber-, PVC-gloves, acid-proof googles, acid-proof clothing, safety boots

protective equipment:

9. Physical and chemical proberties

Lead Sulphuric acid (30 - 38,5 %)

Appearance: Appearance: form: solid form: liquid

colour: grey colour: colourless odour: odourless

Safety-related data Safety-related data

Solidification point: 327 °C Solidification point: -35 °C to -60 °C Boiling point: 1740 °C Boiling point: ca. 108 - 114 °C

Solubility in water (25 °C): low (0,15 mg/l) Solubility in water (25 °C): complete

density (20 °C): 11,35 g/cm³ density (20 °C): 1,2 - 1,3 g/cm³

10. Stability and reactivity of sulphuric acid (30 - 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. Ecological information

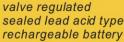
Preliminary remark:

Relevant only if release of sulphuric acid 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 describes 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 spent 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 "Regulatory information").

Spent lead-acid batteries are not allowed to dispose in the domestic waste or be mixed with other batteries in order not to compliance the processing and to prevent danger to humans and the environment.

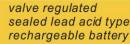
By no means may the electrolyte, the diluted sulphuric acid, be emptied in an inexpert manner. This process is to be carried out by the processing companies.

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):
- a) 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;
- they are no dangerous traces of alkalis or acids on the outside;
- they are protected against short circuits.







- b) Used¹⁾ 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 articles;
- they are protected against short circuits.
- 1) "Used storage batteries" means storage batteries carried for recycling at the end of their normal service life

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:

- UN-No.: 2794

Naming and description: BATTERIES, WET, FILLED WITH ACID

- Hazard class: 8

- Packing group: none

Hazard label: 8

- ADR Tunnel restriction; code: E

Sea transportation according to IMDG code

- UN No.: 2794

Proper shipping name: BATTERIES, WET, FILLED WITH ACID

- Hazard class: 8

- Packaging group: none

- Packaging Instruction: P 801

EmS: F-A, S-BHazard label: 8

Air transportation according to IATA-DGR

- UN No.: 2794

- Propper shipping name: BATTERIES, WET, FILLED WITH ACID

- Class: 8

Packaging group: none
 Packaging Instruction: 870
 Hazard class: (8) Corrosive





14.2 Batteries, wet, non-spillable

Land transportation according to ADR/RID

- UN No.: 2800

Proper shipping name: BATTERIES, WET, NON-SPILLABLE

Hazard class: 8

- Packaging group: none

- Packaging Instruction: P 003, P 801a

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

- UN No.: 2800

Propper shipping name: BATTERIES, WET, NON-SPILLABLE

Hazard class: 8

- Packaging group: none

Packaging constructions: P 003 und PP 16

- 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

- UN No.: 2800

Propper shipping name: BATTERIES, WET, NON-SPILLABLE

Hazard class: 8

Packing group: none

Packaging Instruction: 872Hazard label: (8) Corrosive

- 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 Packing Instruction 870 and carried as dangerous goods according to UN 2794).

14.3 Batteries, damaged:

Land transportation according to ADR/RID

- UN-Nr.: 2794

Propper shipping name: WASTE, BATTERIES, WET, FILLED WITH ACID, ENVIRONMENTALLY HAZARDOUS 2)

Hazard class: 8

- Packing group: none

Transport as dangerous goods considering:

(i) Packing Instruction P 801 a: Packing in accu boxes or

(ii) 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.

2) The note "Environmentally Hazardous" has to be attached when transporting in bulk

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 wheelie 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 seller 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 on properties. Existing laws and regulations have to be observed by the recipient of the product in own responsibility.

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