



Updated August 2024

## MSDS Material Safety Data Sheet

### 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

SUN Battery

Lead-acid battery, filled with dilute sulfuric acid

#### 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.

The basis for the intended use is the standard EN IEC 62485-2. This International Standard provides requirements on safety aspects associated with the erection, use, inspection, maintenance and disposal.



### 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
7439-92-1	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



No smoking, no naked flames, no sparks



Shield eyes



Corrosive (Battery acid)



Note operating instructions



Explosive gas



Keep away from children's reach



#### 4. First aid measures

##### General information:

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

<sup>2)</sup> Seek the advice of a doctor

#### 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<sub>2</sub> 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.



## 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  
+ 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 on workplace: 0,1 mg/m<sup>3</sup>

Hazard symbol



corrosive



Personal protective equipment:

Rubber-, PVC-gloves, acid-proof goggles, acid-proof clothing, safety boots

## 9. Physical and chemical properties

### Lead

Appearance:

form: solid

colour: grey

odour: odourless

Safety-related data

Solidification point: 327 °C

Boiling point: 1740 °C

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

density (20 °C): 11,35 g/cm<sup>3</sup>

### Sulphuric acid (30 - 38,5 %)

Appearance:

form: liquid

colour: colourless

odour: odourless

Safety-related data

Solidification point: -35 °C to -60 °C

Boiling point: ca. 108 - 114 °C

Solubility in water (25 °C): complete

density (20 °C): 1,2 - 1,3 g/cm<sup>3</sup>

## 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) Used<sup>1)</sup> 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-B
- Hazard label: 8

#### **Air transportation according to IATA-DGR**

- UN No.: 2794
- Proper 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
- Proper 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
- Proper shipping name: BATTERIES, WET, NON-SPILLABLE
- Hazard class: 8
- Packing group: none
- Packaging Instruction : 872
- Hazard 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
- Proper shipping name: WASTE, BATTERIES, WET, FILLED WITH ACID, ENVIRONMENTALLY HAZARDOUS <sup>2)</sup>
- 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 wheellie 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.