

# Instructions for the safe handling of AGM batteries (Absorbed Glass Mat lead acid batteries)

1. Identification/ preparation of the substance and identification/  
undertaking of the company

Data on the product  
trade name

## **Absorbed Glass Mat Lead Acid Battery**

Data on the manufacturer:

**Johnson Controls/Optima Batteries  
Am Leineufer 51  
D-30419 Hanover**

**Environmental manager: Dr. Lesch; VB-TH 4**

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2. Composition / information on ingredients

<b>EINECS-No.</b>	<b>CAS-No.</b>	<b>Description</b>	<b>Content (Unit)*</b>	<b>Classification</b>
231-100-4	7439-92-1	blue lead	25-35 Weight %	- -
231-100-4	7439-92-1	lead alloys with traces of As, Sb, Sn		
231-100-4	7439-92-1	inorganic lead compounds	37-47 Weight %	T Toxic R61-20/22-33-62-50/53
231-639-5	7664-93-9	sulphuric acid absorbed in glass fiber material	16-20 Weight %	C Corrosive R 35

*\*Content may vary*

3. Hazards identification

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

Lead-acid batteries have the following significant characteristics:

- They contain diluted sulphuric acid, which is absorbed in glass fiber material. Skin contact with glass fiber material may cause severe acid burns.
- During the charging process they develop hydrogen gas and oxygen gas, which under certain circumstances may turn into an explosive mixture.

For this reason, the batteries have been marked with the following hazard symbols:



The significance of the hazard symbols is:

1. No smoking, no open flames, no sparks.
2. Wear safety goggles.
3. Keep away from children.
4. Sulphuric acid.
5. Observe operating instructions.
6. Explosive gas mixture.

Additionally: Do not clean batteries with dry washers, use only wet washers.

#### 4. First-aid measures

*This information is of relevance only, if the battery is broken and direct contact to the compounds occurred.*

##### **Lead containing battery paste:**

*after contact to skin*

clean with water and soap

##### **Sulphuric acid:**

*after contact to skin*

rinse with water; remove and wash wetted clothing

*after inhalation of acid mist\*)*

inhale fresh air

*after contact with the eyes\*)*

rinse under running water for several minutes

*after swallowing\*)*

drink a lot of water immediately, and swallow activated carbon, do not induce vomiting.

*\*)Seek the advice of a doctor*

#### 5. Fire-fighting measures

##### **Suitable extinguishing agents:**

CO<sub>2</sub> and dry powder fire extinguishing agent

##### **Unsuitable extinguishing agents:**

water in case of battery voltages of over 120 V

##### **Special protective equipment:**

protective goggles, respiratory protective equipment, acid protective equipment, acid-proof clothing in case of larger stationary battery plants of larger quantities stored

#### 6. Accidental release measures

Cleaning / take up procedures

If a battery is destroyed, the released glass fiber material must be disposed with due regard to the official local regulations. Do not permit penetration into the sewage system, the earth or water bodies. If necessary, use lime / sodium carbonate for neutralisation.

## 7. Handling and storage

Store under roof in cool ambience-charged lead-acid batteries do not freeze up to -50°C; prevent short circuit. If batteries have to be stored in storage rooms, it is imperative that the instructions for use are observed. Additional Information about the storage of lead-acid batteries is available by Johnson Controls/Optima Batteries.

## 8. Exposure limits and personal protective equipment

8.1 No exposure caused by lead and lead containing battery paste when handling properly.

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

Threshold value on workplace		Occupational exposure to sulphuric acid mist is regulated on a national basis
Hazard symbol		C, corrosive <i>(sulphuric acid is adsorpted in glass fiber material)</i>
R-phrases	R-35	Causes severe burns.
S-phrases	S-2	Keep out of reach of children
	S-16	Keep away from sparks or naked flame – No smoking
	S-26	In case of contact with eyes rinse immediately with plenty of water and seek medical advice.
	S-45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).
Personal protective equipment		Rubber or PVC gloves, acid-proof goggles, acid-proof clothing, safety boots.

## 9. Physical and chemical properties

### Lead

### Sulphuric acid (38.5 to 44.4 %)

Appearance		Appearance	
form:	solid	form:	liquid
colour:	grey	<i>(sulphuric acid is adsorbed in glass fiber material)</i>	
odour:	odourless	colour:	colourless
<b>Safety-related data</b>		odour:	odourless
<i>pH-value(25°C):</i>	7 – 8 (100 mg/l water)	<b>Safety-related data</b>	
<i>solidification point:</i>	327 °C	<i>pH-value(25°C):</i>	less than 1
<i>boiling point:</i>	1'740 °C	<i>solidification point:</i>	-48 to -58 °C
<i>solubility in water: (25 °C)</i>	low (0.15 mg/l)	<i>boiling point:</i>	approx. 106 to 123°C
<i>density (20 °C):</i>	11.35 g/cm <sup>3</sup>	<i>solubility in water: (25 °C):</i>	complete
<i>vapour pressure (20 °C)</i>	-	<i>density (20 °C):</i>	(1.2 to 1.4) g/cm <sup>3</sup>
		<i>vapour pressure (20 °C)</i>	13.3 mbar
<ul style="list-style-type: none"> <li>- Lead and lead-containing battery paste is poorly soluble in water.</li> <li>- Lead can be dissolved in an acidic or alkaline environment.</li> </ul>			

## 10. Stability and reactivity of the sulphuric acid (38.5 to 44.4 %)

- Corrosive, inflammable liquid (at AGM-Batteries absorbed in glass fiber material)
- Thermal decomposition at 338 °C
- Destroys organic materials, such as cardboard, wood, textiles.
- Reacts with metals producing hydrogen.
- Vigorous reactions with alkalis.

## 11. Data on toxicology of the constituents

### - Sulphuric acid

is intensely corrosive to skin and mucous membranes; the inhalation of mists may cause damage to the respiratory tract.

Acute toxicity data: LD50 (oral, rat) 2140 mg/kg  
LC50 (inhalation, rat) 510 mg/mc/2h.

**- Leads and its inorganic compounds**

may cause damage to the blood, nerves, and kidneys when taken in. Lead compounds are considered to be toxic to reproduction.

**Note:** *Not applicable to the finished product, only applicable to list compounds in case of broken battery.*

**12. Ecological information**

*This information is of relevance only, if the battery is broken and direct contact to the compounds occurred.*

**- Lead and its inorganic compounds**

Chemical flocculation is required for elimination from water. Waste water containing lead must not be disposed of in untreated condition.

Water-polluting material within the meaning of the German Water-Resources Act (WHG):

Water pollution class 1  
(mildly water polluting)

**- Sulphuric acid**

*(sulphuric acid is adsorpted in glass fiber material)*

In order to avoid damage to the sewage system, the acid has to be neutralised by means of lime or 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 batteries also contain soluble components of lead that can be toxic to aquatic environments.

Water-polluting material within the meaning of the German Water-Resources Act (WHG)

Water pollution class 1  
(mildly water polluting)  
*(fluid is absorbed in glass fiber material)*

**13. Disposal considerations**

The point 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.

In Germany old batteries are recycled by VARTA Recycling plant:

VARTA Automotive GmbH  
Geschäftsbereich Recycling  
Krautscheider str. 22  
53567 Buchholz

Spent lead-acid batteries (EWC 160601) are subject to the regulation of 91/157/EC (Battery Directive) and the national regulations on recollecting batteries. They are marked with the recycling / return symbol and with a crossed-out roller container.

Dead lead-acid batteries should not be mixed with other batteries in order not to complicate 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.

## 14. Transport instructions

Land Transport	<p>Land Transport (ADR/RID)</p> <p>UN N°: UN2800  Classification ADR/RID: Class 8  Proper Shipping Name: BATTERIES, (ACCUMULATORS), WET, NON-SPILLABLE, electric storage</p> <p>Packing Group ADR: not assigned  Label required: not assigned</p> <p>ADR/RID:  AGM batteries are non-spillable batteries (special provision 238) and are exempt from all ADR/RID provisions, if they are protected from short circuit.</p>
Sea Transport	<p>Sea Transport (IMDG Code)</p> <p>UN N°: UN2800  Classification: Class 8  Proper Shipping Name: BATTERIES, (ACCUMULATORS), WET, NON SPILLABLE, electric storage</p> <p>Packing Group: not assigned  EmS: not assigned  Label required: not assigned</p> <p>AGM batteries are non-spillable batteries (special provision 238) and are exempt from all IMDG codes, if they are protected from short circuit.</p>
Air Transport	<p>Air Transport (IATA-DGR)</p> <p>UN N°: UN2800  Classification: Class 8  Proper Shipping Name: BATTERIES, (ACCUMULATORS), WET, NON SPILLABLE, electric storage</p> <p>Group: not assigned  Label required: not assigned</p> <p>AGM batteries are non-spillable batteries (special provision A67) and are exempt from all IATA DGR codes, if they are protected from short circuit.</p>

## Notice

### Special provision 238 ADR/RID/IMDG Code:

- a.) Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential test given below, without leakage of battery fluid

#### Vibration test:

The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz and 55 Hz. The entire range of frequencies and return is traversed in  $95 \pm 5$  minutes for each mounting position (direction of vibration) of the battery. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

#### Pressure differential test:

Following the vibrations test, the battery is stored for six hours at  $24\text{ °C} \pm 4\text{ °C}$  while subjected to a pressure differential of at least 88 kPa. The battery is tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

#### b.)

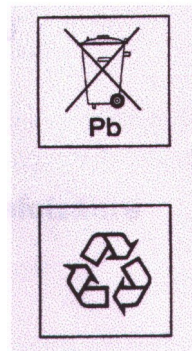
Non-spillable batteries are not subject to the requirements of ADR if, at a temperature of  $55\text{ °C}$ , the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if, as packaged for carriage, the terminals are protected from short circuit.

### A67 IATA DGR:

Non-spillable batteries are considered to be non-dangerous if, at a temperature of  $55\text{ °C}$ , the electrolyte will not flow out of a ruptured or cracked case and there is no free liquid to flow. When packaged for transport, the terminals must have protection against short circuits.

## 15. Marketing

In accordance with EC and national laws lead-acid batteries have to be marked by a crossed out refuse bin with the chemical symbol for lead Pb shown below, together with the ISO return/ recycling symbol.



In addition, the ISO-return / recycling symbol is rendered.

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, which is required by the EC Directives quoted above.

The manufacturers and sellers of the batteries subject to identification requirements (packaging, technical instructions, leaflets) shall be responsible for this information.

## **16. Other information**

The information given above is provided in good faith based on existing knowledge and does not constitute an assurance of safety under all conditions. It is the user's responsibility to observe all laws and regulations applicable for storage, use, maintenance or disposal of the product. If there are any queries, the supplier should be consulted.