TRIATHLON®
INTELLIGENT BATTERIES

Material/Product Safety Data Sheet (MSDS / PSDS)

Lead-acid batteries
US-BCI, TPzS/TPzB and TPzV/TPzV-BS

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1. PRODUCT AND COMPANY IDENTIFICATION

Product: US-BCI, TPzS, TPzB, TPzV, TPzV-BS

Category: TPzS vented lead-acid battery, wet, filled with diluted acid[1];
TPzV sealed lead-acid battery, wet, leak-proof

Manufacturer:

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QUESTIONS ABOUT TRANSPORT AND EMERGENCY ASSISTANCE

REACH Registration of Chemicals GmbH
Emergency number EU and outside USA: +49 / (0)700 24112112 (TBR)
Emergency number within USA: +1149 / (0)700 24112112 (contact ID:TBR)

-> Please state your letter code in brackets (TBR) when prompted.

2. HAZARDS IDENTIFICATION

No hazards occur during the normal operation of a Lead Acid Battery as it is described in the instructions for use that are provided with the Battery. Lead-acid Batteries have three significant characteristics:

- They contain an electrolyte which contains diluted sulphuric acid. Sulphuric acid may cause severe chemical burns.
- During the charging process or during operation they might develop hydrogen gas and oxygen, which under certain circumstances may result in an explosive mixture.
- They can contain a considerable amount of energy, which may be a source of high electrical current and a severe electrical shock in the event of a short circuit.

The Batteries have to be marked with the symbols listed under item 15.

3. COMPOSITION OF INGREDIENTS

CAS-No.	Description	Content[2] (% of weight)	Hazard symbol	GHS hazard pictograms	H-phrases
7439-92-1	Lead Grid (metallic lead, lead alloyswith possible traces of additives)	~ 32	T[3] (toxic)		H360 H362, H332, H302 H372, H351
7439-92-1	Active Mass[4] (BatteryOxide, inorganic lead compounds)	~ 32	T (toxic)		H360D H302, H332 H361f, H412
7664-93-9	Electrolyte[5] (diluted sulphuric acid with additives)	~ 29	C (corrosive)		H290 H314
	Plastic Container / Plastic Parts[6]	~ 7			

[1] See item 14 – Transport Information.

[2] Contents may vary due to performance data of the battery.

[3] As result of the harm to the unborn children Lead compounds are classified as toxic for reproduction, Category 1. As this category is not described with a specific hazard symbol, Lead compounds have to be labelled with the „skull " symbol. Lead compounds are not classified „toxic".

[4] See chapter 12 – Ecological Information.

[5] Density of the electrolyte varies in accordance to the state of charge.

[6] Composition of the plastic may vary due to different customer requirements.

4. FIRST-AID MEASURES

This information is of relevance only if the battery is broken and this results in a direct contact with the ingredients.

4.1 General

Electrolyte (diluted sulphuric acid): sulphuric acid acts corrosively and damages skin.

Lead compounds: lead compounds are classified as toxic for reproduction (if swallowed).

4.2 Electrolyte (Sulphuric acid)

After skin contact: rinse with water, remove and wash wetted clothing.

After inhalation of acid mist: inhale fresh air, seek advice of a medical doctor.

After contact with the eyes: rinse under running water for minimum 15 minutes, seek advice of a medical doctor.

After swallowing: drink lot of water immediately, swallow activated carbon, seek advice of a medical doctor.

4.3 Lead compounds

After skin contact: clean with water and soap.

After contact with the eyes: rinse under running water for minimum 15 minutes, seek advice of a medical doctor.

5. FIREFIGHTING MEASURES

Suitable fire extinguishing agents: CO_2 or dry powder extinguishing agents.

Unsuitable fire extinguishing agents: Water, if the battery voltage is above 120 V.

Special protective equipment: Protective goggles, respiratory protective equipment, acid protective equipment, acid-proof clothing in case of larger stationary battery plants or where larger quantities are stored.

6. ACCIDENTAL RELEASE MEASURES

This information is of relevance only if the battery is broken and the ingredients are released.

In the case of spillage, use a bonding agent, such as sand, to absorb spilt acid; use lime / sodium carbonate for neutralisation; dispose of with due regard to the official local regulations; do not allow penetration into the sewage system, into earth or water bodies.

7. HANDLING AND STORAGE

- Store under roof in cool ambiance - charged lead-acid batteries do not freeze up to -50°C; prevent short circuits.
- Seek agreement with local water authorities in case of larger quantities of batteries to be stored.
- If batteries have to be stored, it is imperative that the instructions for use are observed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Lead and Lead compounds

No exposure to lead and lead-containing battery paste during normal conditions of use.

8.2 Electrolyte (Sulphuric Acid)

Exposure to sulphuric acid and acid mist might occur during filling and charging.

Threshold value in workplace: Occupational exposure limits for sulphuric acid mist are regulated on a national basis.

Hazard symbol: GHS05, corrosive.

Personal protective equipment: Protective goggles, rubber or PVC gloves, acid-resistant clothing, safety boots.

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 protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or 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.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induve vomiting.
P310	Immediately call a POISON CENTER or a doctor.

9. PHYSICAL AND CHEMICAL PROPERTIES

	Lead and Lead compounds	Electrolyte (diluted sulphuric acid, 30 to 38.5%)
Appearance		
form:	solid	liquid
colour:	grey	colourless
odour:	odourless	odourless
Safety-related data		
solidification point:	327 °C	-35 to -60 °C
boiling point:	1740 °C	approx. 108 to 114 °C
solubility in water:	very low (0.15 mg/l)	complete
density (20 °C):	11.35 g/cm³	1.2 to 1.3 g/cm³
vapour pressure (20 °C):	N.A.	14,6 mbar

10. STABILITY AND REACTIVITY (diluted sulphuric acid, 30 - 35,5%)

- Corrosive, non-flammable liquid.
- Thermal decomposition at 338° C.
- Destroys organic materials such as cardboard, wood, textiles.
- Reacts with metals, producing hydrogen.
- Vigorous reactions on contact with sodium hydroxide and alkalis.

11. TOXICOLOGICAL INFORMATION

This information does not apply to the finished product "lead-acid battery". This information only applies to its compounds in case of a broken product. Different exposure limits exist on a national level.

11.1 Electrolyte (diluted sulphuric acid):

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

Acute toxicity data:

- $LD_{50\ (oral,\ rat)}$ = 2.140 mg/kg
- $LC_{50\ (inhalation,\ rat)}$ = 510 mg/m³/2h

11.2 Lead and Lead compounds

Lead and its compounds used in a Lead Acid Battery may cause damage to the blood, nerves and kidneys when ingested. The lead contained in the active material is classified as toxic for reproduction.

12. ECOLOGICAL INFORMATION

This information is of relevance if the battery is broken and the ingredients are released to the environment.

12.1 Electrolyte (diluted sulphuric acid)

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 electrolyte may also contain soluble components of lead that can be toxic to aquatic environments.

12.2 Lead and Lead compounds

Chemical and physical treatment is required for the elimination from water. Waste water containing lead must not be disposed of in an untreated condition.

The former classification of Lead compounds as toxic for the aquatic environment R50/53 had been triggered from test results generated in the 80's for soluble Lead compounds (Lead Acetate). The hardly soluble Lead compounds such as Battery Lead Oxide were not tested at this time. Tests on Battery Lead Oxide were carried out in 2001 and 2005. The respective test results conclude that Battery Lead Oxide is not toxic for the environment, neither R50 nor R50/53 nor R51/53. From this it follows that the general classification for Lead compounds (R50/53) does not apply to Battery Lead Oxide. As the result of this the Risk Phrase R52/53 (Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment) applies to Battery Lead Oxide (see chapter 12 – Ecological Information).

Effects of Battery Lead Oxide in the aquatic environment:

- Toxicity for fish: 96 h LC 50 > 100 mg/l
- Toxicity for daphnia: 48 h EC 50 > 100 mg/l
- Toxicity for alga: 72 h IC 50 > 10 mg/l

The results demonstrate these Battery Lead Oxide compounds in a concentration of 100 mg/l have no adverse effect on fish and daphnia. A concentration of these Battery Lead Oxide of 10 mg/l has no adverse effect on the rate of growth and the biomass. For the classification according to Directive 67/548/EEC the most sensitive adverse effect has to be considered. As a result of the toxicity for alga at > 10 mg/l Battery Lead Oxide has to be classified according to the R-Phrases 52/53 (Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment).

13. DISPOSAL CONSIDERATIONS

Spent lead-acid batteries are subject to regulation of the EU Battery Directive (91/157/EC, repealed by 2006/66/EU) and its adoptions into national legislation on the composition and end-of-life management of batteries.

Spent Lead-Acid batteries (EWC 160601) are recycled in lead refineries (secondary lead smelters). The components of a spent Lead-Acid battery are recycled or re-processed.

At 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.

To simplify the collection and recycling or re-processing process, spent Lead-Acid batteries must not be mixed with other batteries.

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

14. TRANSPORT INFORMATION

14.1 Batteries, wet, filled with acid :

Land Transport (road/rail)	**Land Transport (ADR/RID)** - UN N°: UN2794 - Classification ADR/RID: Class 8 - Proper Shipping Name: BATTERIES, WET, FILLED WITH ACID - Packing Group: not assigned; packing instructions P801 - Label required: Hazard Label 8 (Corrosive); tunnel code E - ADR/RID: New and spent batteries are exempt from all ADR/RID (special provision 598).
Sea Transport (on account of the differences between products supplied by various manufacturers, the supplier should be consulted).	**Sea Transport (IMDG Code)** - Classification: Class 8 - UN N°: UN2794 - Proper Shipping Name: BATTERIES, WET, FILLED WITH ACID - Packing Group: not assigned - EmS: F-A, S-B - Packing instructions: P801
Air Transport	**Air Transport (IATA-DGR)** - Classification: Class 8 - UN N°: UN2794 - Proper Shipping Name: BATTERIES, WET, FILLED WITH ACID - Label required: Hazard Label 8 (Corrosive) - Packing instructions: 870 - Packing Group: not assigned

14.2 Batteries, wet, non-spillable:

Land Transport (road/rail)	**Land Transport (ADR/RID, U.S. DOT)** - UN N°: UN2800 - Classification ADR/RID: Class 8 - Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE - Packing Group: not assigned; packing instructions P003 and P801 - Label required: Hazard Label 8 (Corrosive) - ADR/RID: New and spent batteries are exempt from all ADR/RID (special provision 598). - A manufactures declaration must be available. If not available, batteries have to be handled as described under 14.1

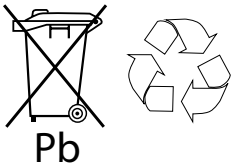
Sea Transport	**Sea Transport (IMDG Code)** - UN N°: UN2800 - Classification: Class 8 - Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE - Packing Group: not assigned - EmS: F-A, S-B - Label required: Hazard Label 8 (Corrosive) - If non-spillable batteries meet the Special Provision 238, they are exempted from all IMDG codes provided that the batteries' terminals are protected against short circuits. - A manufactures declaration must be available. If not available, batteries have to be handled as described under 14.1
Air Transport	**Air Transport (IATA-DGR)** - UN N°: UN2800 - Classification: Class 8 - Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE - Packing Group: not assigned - Packing instructions: 872 - Label required: Hazard Label 8 (Corrosive) - If non-spillable batteries meet the Special Provision A67, they are exempted from all IATA DGR codes provided that the batteries' terminals are protected against short circuits. - A manufactures declaration must be available. If not available, batteries have to be handled as described under 14.1

14.3 Batteries, broken:

Land Transport	**Land Transport (ADR/RID)** - UN N°: UN2794 - Classification ADR/RID: Class 8 - Proper Shipping Name: BATTERIES, WET, FILLED WITH ACID - Packing Group ADR: not assigned; Packing instructions P801, P801a - Label required: Hazard Label 8 (Corrosive) - Packaging instructions P 801a: hazardous goods transport (Battery Boxes) or special provisions VV14: hazardous goods transport (goods in bulk)

15. REGULATORY INFORMATION

Identification



In accordance with EU Battery Directive and the respective national legislation, Lead-Acid batteries have to be marked by a crossed out dust bin with the chemical symbol for lead shown below, together with the ISO return/recycling symbol.

In addition Lead-Acid batteries have to be labelled with the hazard symbols described below:

	No smoking, no open flames, no sparks		Corrosive		Wear Safety googles
	Keep away from children		Explosive gas mixture		Observe operating instructions

16. OTHER INFORMATION

16.1 Safety data sheet

The European Directive 91/155 / EEC describing the requirements for safety data sheets was repealed by the Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals of 1 January 2007 (REACH Regulation 1907/2006). / EC, Art. 31). The requirement to publish a safety data sheet applies to all suppliers of substances and preparations.

As already defined under the previous Directive, it is not necessary to develop and maintain a safety data sheet for products such as batteries.

16.2 Substances of Very High Concern (SVHC)

The publication of the European Chemicals Agency on Substances of Very High Concern is being monitored by Triathlon. As provided by REACH, customers shall receive the information they need when an updated publication can add a part of the list of SVHCs relevant to our products.

Four lead compounds - lead monoxide, lead tetroxide, tetra-lead trioxide sulphate and penta-blei-tetraoxide sulphate - were added to the list of substances of very high concern under Annex XIV of the REACH Regulation on December 19, 2012.

The ready-to-use batteries contain no substance of very high concern. Regardless of the battery design, this applies to all batteries with electrolyte (filled, MHF, gel, AGM)

Dry batteries / dry cells (dry charged plates that are supplied without electrolyte) contain more than 0.1% lead monoxide. Lead monoxide (CAS No. 1317-36-8) is a substance of very high concern.

As soon as the batteries / cells are filled with electrolyte, all lead monoxide is converted and they are therefore no longer among the substances of very high concern (SVHC).

16.3 GHS label

The European GHS Regulation, among other things, describes the classification and labelling of chemicals and preparations. GHS is not a regulation that describes labelling requirements for products such as lead-acid batteries.

Six pictograms on batteries are aimed at safety information and are based on an international standard (EN 50342).

These labels remain unaffected.

16.4 General

The above information is provided to the best of our knowledge and conscience on the basis of available knowledge and does not constitute security in all conditions. It is the user's responsibility to comply with all laws and regulations that apply to the storage, use, maintenance or disposal of the product. If there are any questions, please consult the supplier.

However, this does not guarantee certain product properties and does not establish a legally valid contractual relationship.

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