Safety Data Sheet

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

1 Identification of the article and the company

Lead-acid battery filled with diluted sulphuric acid, adsorbed in glass fiber material

Supplier:

DIESEL TECHNIC SE
Wehrmannsdamm 5-9
27245 Kirchdorf
Germany

Fon: +49 04273 89-0
Contact: www.dieseltechnic.com/contact

2 Composition / Information on Ingredients

EINECS-No.	CAS-No.	REACH Register No.	Description:	Content (% of weight)[1]	Classification 1272/2008 (CLP)
231-100-4	7439-92-1	01-2119513221-59-0069	Lead and lead alloys	~32	GHS08 Repr. 1 A H360FD STOT RE1 H372 Lact. H362 Lead metal is a substances of the Reach Candidate List
231-100-4	7439-92-1	01-2119513221-59-0069	Active mass (battery lead paste)	~32	GHS 07, Acute Tox. 4, H302, H332 GHS 08, Signal word: Danger Repr. 1 A, H 360FD, STOT RE 1, H372. Lact. H362 Aquatic Chronic 3, H412
31-639-5	7664-93-9	01-2119458838-20-0122	Diluted sulphuric acid adsorbed in glass fiber material[2]	~29	GHS 05, H314 Signal word: Danger
-	-	-	Plastic container[3]	~7	-

[1] Content may vary.
[2] Concentration of diluted sulphuric acid varies in accordance to the state of charge.
[3] Composition of the plastic may vary due to different customer requirements.

3 Hazard identification

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

Lead acid batteries have two significant characteristics:

» They contain diluted sulphuric acid, which may cause severe acid burns, when the material is touched.
» During the charging process they develop hydrogen gas and oxygen, which under certain circumstances may turn into an explosive mixture.

For this reason, batteries are marked with the following hazard symbols: [1]

Meaning of the hazard symbols

1. No smoking, no naked flames, no sparks
2. Shield eyes
3. Corrosive (diluted sulphuric acid)
4. Consult operating instructions
5. Explosive gas
6. Keep away from children's reach

[1)]The above mentioned hazard symbols 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.

Note: Do not clean batteries with dry cloths, use only wet cloths, due to electrostatic charge.

4 First aid measures

The information below is of relevance only, if the battery is damaged and direct contact to the contained compounds takes places.
According EC 1272/2008 (CLP) the contained compounds are classified as hazardous.

4.1 Diluted sulphuric acid

Hazard Statement according EC 1272/2008 (CLP):

H314	Causes servere skin burns and eye damages.

Precautionary Statements according EC 1272/2008 (CLP):

P264	Wash hands thoroughly after handling.
P301+P330+P331	If swallowed: rinse mouth. Do not induce vomiting.
P280	Wear protective gloves/protective clothing/eye protection.
P260	Do not inhale dust/fume/gas/mist/vapors/spray.
P363	Wash contaminated clothing before reuse.
P303+P361+P353	Conatct on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
In case of exposure:	Visit doctor.

4.2 Lead and battery lead paste

Hazard statements according EC 1272/2008 (CLP):

H302	Harmful if swallowed.
H332	Harmful if inhaled.
H360FD	May damage the unborn child. Suspected of damaging fertility.
H362	May cause harm to breast-fed children.
H372	Causes damage to organs (the central nervous system and system for reproduction) through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements according EC 1272/2008 (CLP):

P101	If medical advice is needed, have product container or label at hand.
P202	Do not handle until all safety precautions have been read and understood.
P263	Avoid contact during pregnancy/while lactation.
P273	Avoid release to the environment.
P308+P313	If exposed or concerned: Get medical advice/attention.
P405	Store locked up.
P501	Dispose of contents/container according to the local waste management regulations.
In case of exposure:	Visit doctor.

5 Fire-fighting measures

Suitable extinguishing agents:
Water and foam are suitable extinguishing agents. For incipient fire CO2 is most efficient agent.

Hazards which can be caused by a fire:
Hazardous combustion gases can be generated. Lead vapor, Lead oxides, Sulphur dioxide.

Special protective equipment:
Protective goggles, respiratory protective equipment, acid proof clothing.

6 Accidental release measures

Cleaning / take-up procedures:
Use a bonding agent, such as sand, use lime or sodium carbonate for neutralization; 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 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. If batteries have to be charged in storage rooms, it is imperative that the instructions for use are observed.
Additional Information about the storage of lead-acid batteries can be requested from Diesel Technic SE.

8 Exposure controls / personal protection

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

8.2 In case of a damaged battery and with direct contact to the contained sulphuric acid, please note following:

Dermal:	Sulfuric acid is corrosive. DNEL values for local dermal effects are not derived.
Inhalation:	0,1 mg/ml

Personal protective equipment (in case of a damaged battery):

Eye protection:	Safety glasses (are necessary during recharging also).
Recommend:	Safety gloves for contact with sulphuric acid.
Type of material:	Rubber, PVC gloves acid proof.
Working Clothes and shoes:	Acid proof clothing, safety boots.

9 Physical and chemical properties

Diluted sulphuric acid (30 to 38.5 %)		Lead	
Appearance		**Appearance**	
form:	liquid	form:	solid
colour:	colourless	colour:	grey
odour:	odourless	odour:	odourless
Safety-related data		**Safety-related data**	
pH-value (25°C):	0,3 (49 mg/l water)	pH-value (25°C):	7-8 (100 mg/l water)
solidification point:	-35 to -60 °C	solidification point:	327 °C
boiling point:	approx. 108 to 144 °C	boiling point	1.740 °C
solubility in water:	sulphuric acid is (25 °C) miscible with water	solubility in water:	low (0.15 mg/l) (25 °C)
density (20 °C):	1,2 - 1,3 g/cm³	density (20 °C):	11,35 g/cm³
vapour pressure (20 °C):	14.6 mbar	vapour pressure (20 °C):	-
flash point:	non combustible	flash point:	non combustible
explosive properties:	non explosive	explosive properties:	non explosive

10 Stability and reactivity

Diluted sulphuric acid

10.1 Reactivity

Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air. Destroys organic materials, such as cardboard, wood, textiles.

10.2 Chemical stability

Thermal decomposition at 338 °C

10.3 Possibility of hazardous reactions

Reaction with many metals produced extremely flammable hydrogen gas which can form explosive mixtures with air.

10.4 Conditions to avoid

No data available.

10.5 Incompatible materials

Vigorous reactions with alkalis.

10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 Toxicological information

11.1 Diluted sulphuric acid

11.1.1 Information on toxicological effects

Sulphuric acid immediately dissociates to the hydrogen and sulphate ions, with the hydrogen ion being responsible for the local toxicity (irritation and corrosively) of sulphuric acid.

11.1.2 Acute toxicity

Oral, rat, LD50: 2140 mg/kg bw (similar to OECD 401)
Inhalation, rat LC50 : 375 mg/m³ air (OECD Guideline 403)

11.1.3 Dermal

No data on acute dermal toxicity in animals are available. Although this is a potential route of exposure for workers, testing is not justified for scientific reasons and on animal welfare grounds. The effects of acute dermal exposure to sulphuric acid on animals can be readily predicted, and the data from human exposure are sufficient to characterize the effects.

No classification for acute toxicity is proposed according to current EU criteria.

11.1.4 Irritation and corrosion

Skin irritation / corrosion:	corrosive
Eye irritation:	corrosive

Sulphuric acid is listed on Annex I of Directive 1272/2008 (CLP) with classification Skin Corrosive 1 A > 15 %.

No studies of dermal irritation / corrosion have been performed with the substance and none are proposed, based on scientific considerations and for reasons of animal welfare.

11.1.5 Sensitization

No classification is proposed for skin sensitization or respiratory sensitization based on theoretical considerations and in the absence of any findings in exposed humans following occupational use over a long period of time.

Subacute, subchronic and prolonged toxicity (Repeated dose toxicity)

Inhalation (subacute, inhalation: aerosol, nose only), rat NOAEC: 0.3 mg/m³ air (OECD Guideline 412).
Target organs: respiratory: larynx
Classification for severe effects after repeated or prolonged exposure is not proposed.

11.1.6 Mutagenicity

Genetic toxicity: negative.
No classification is proposed for genotoxicity

11.1.7 Carcinogenicity

The available animal data do not support the classification of sulphuric acid for carcinogenicity.

11.1.8 Reproductive toxicity

Inhalation, rabbit, mouse: NOAEC: 19.3 mg/m³ air (OECD Guideline 414).
No classification is proposed for reproductive or developmental toxicity.

11.1.9 STOT-single exposure

Sulfuric acid is not classified for STOT SE.

11.1.10 STOT-repeated exposure

Sulfuric acid is not classified for STOT RE.

11.1.11 Aspiration hazard

Sulfuric acid is not classified for aspiration hazard.

11.1.12 Other information on acute toxicity

No other information available.

11.2 Battery lead paste

11.2.1 Information on toxicological effects

The toxicity of this product has not been tested. The assessment of the toxicity has been done using the test data with similar inorganic lead compounds.

11.2.2 Toxicokinetic assessment

Inorganic lead compounds are slowly absorbed by ingestion and inhalation and poorly absorbed through the skin. If absorbed, lead will accumulate in the body with low rates of excretion, leading to long-term build up. Part of risk management is to take blood samples from workers for analysis to ensure that exposure levels are acceptable.

11.2.3 Acute toxicity

Sparingly soluble inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin, and by inhalation. Nevertheless current EU regulations require this substance to be classified as harmful by ingestion and inhalation.

Toxicity data:

LD50 (oral, rat)	> 2000 mg/kg
LD50 (dermal, rat)	> 2000 mg/kg
LC50 (4 hr inhalation, rat)	> 5 mg/L

No toxicity data available for Lead metal (lead metal powder, particle < 1mm).

11.2.4 Irritation and corrosion

Skin:
Studies of similar sparingly soluble inorganic lead compounds have shown that they are not corrosive or irritating to the skin of rabbits. This is supported by the lack of reports of irritant effects from occupational settings.

Eyes:
Studies of lead monoxide and similar sparingly soluble inorganic lead compounds have shown that they are not corrosive or irritating to the eyes of rabbits.

Respiratory:
No symptoms of respiratory irritation were noted during long-term inhalation studies involving lead monoxide.

11.2.5 Sensitization

There is no evidence that sparingly soluble inorganic lead compounds cause respiratory or skin sensitization.

11.2.6 Subacute, subchronic and prolonged toxicity

11.2.7 Germ cell mutagenicity

The evidence for genotoxic effects of highly soluble inorganic lead compounds is contradictory, with numerous studies reporting both positive and negative effects. Responses appear to be induced by indirect mechanisms, mostly at very high concentrations that lack physiological relevance.

11.2.8 Carcinogenicity

There is evidence that highly soluble inorganic lead compounds may have a carcinogenic effect, particularly on the kidneys of rats. However, the mechanisms by which this effect occurs are still unclear. Epidemiology studies of workers exposed to inorganic lead compounds have found a limited association with stomach cancer. This has led to the classification by IARC that inorganic lead compounds are probably carcinogenic to humans (Group 2A).

11.2.9 Reproductive toxicity

Exposure to high levels of inorganic lead compounds may cause adverse effects on male and female fertility, including adverse effects on sperm quality. Prenatal exposure to inorganic lead compounds is also associated with adverse effects on neurobehavioral development in children.

11.2.10 STOT-single exposure

Sparingly soluble inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin, and by inhalation, with no evidence of any local or systemic toxicity from such exposures, reproductive function and the central nervous system.

11.2.11 STOT-repeated exposure

Inorganic lead compounds are cumulative poisons and may be absorbed into the body through ingestion or inhalation. Inorganic lead compounds have been documented in observational human studies to produce toxicity in multiple organ systems and body function including the haematopoietic (blood) system, kidney function.

11.2.12 Aspiration hazard

Inorganic lead compounds is not classified for aspiration hazard.

11.2.13 Other information on acute toxicity

No other information available.

12 Ecological information

12.1 Diluted sulphuric acid

12.1.1 Toxicity

12.1.2 Aquatic toxicity

This substance is not classified as hazardous to the aquatic environment.
Results on aquatic toxicity in freshwater:

12.1.3 Short-term toxicity

Fish, Lepomis macrochirus, LC50 (96 h): > 16-< 28 mg/L. (no information on test methodology)

12.1.4 Bioaccumulative potential

Sulphuric acid is a strong mineral acid (pKa =1.92) that dissociates readily in water to hydrogen ions and sulphate ions (at environmentally relevant pH) and is totally miscible with water. The resulting hydrogen ions and sulphate ions are naturally present in water/sediment and no bioaccumulation of these ions is predicted.

12.1.5 Mobility in soil

Sulphuric acid is a strong mineral acid that dissociates readily in water to hydrogen ions and sulphate ions (at environmentally relevant pH) and is totally miscible with water. The resulting hydrogen ions and sulphate ions are naturally present in water/sediment. The hydrogen ions will contribute to local pH and are potentially mobile; sulphate ions may be incorporated into naturally occurring mineral species.

12.1.6 Results of PBT and vPvB assessment

Sulphuric acid is neither a PBT nor a vPvB substance.

12.1.7 Other adverse effects:

No other information available.

12.2 Battery lead paste

12.2.1 Toxicity

12.2.2 Aquatic toxicity

Battery lead oxide which is comparable to the inorganic lead compounds within a lead acid battery is classified as aquatic chronic 3, H412.

12.2.3 Short term toxicity:

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

12.2.4 Bioaccumulative potential

Inorganic lead is considered to be bioaccumulative in the environment, and may accumulate in aquatic and terrestrial plants and animals. The following bioaccumulation/bioconcentration factors have been derived for Pb inorganic compounds:

12.2.5 Aquatic compartment

Bioaccumulation/bioconcentration factors in freshwater: 1,553 L/kg (wet weight)

12.2.6 Soil compartment

Bioaccumulation/bioconcentration factors in soil: 0.39 kg/kg (dry weight).

12.2.7 Mobility in soil

This product contains inorganic lead compounds which are sparingly soluble and are expected to be adsorbed onto soils and sediments. Mobility is expected to be low.

12.2.8 Results of PBT and vPvB assessment

The PBT and vPvB criteria in Annex XIII of the REACH Regulation do not apply to inorganic substances.

12.2.9 Other adverse effects

No other information available.

13 Disposal considerations

Used lead-acid batteries (EWC 160601*) are subject to the regulation of EU (Battery Directive) and its adoptions into national legislation on the composition and end-of-life management of batteries. They are marked with the recycling / return symbol and with a crossed-out roller container. Other battery chemistries have to be separated from lead-acid batteries to avoid any risks during collection, transport and recycling.

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

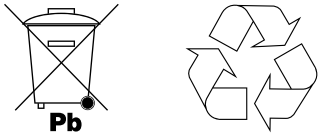
DIESEL TECHNIC SE
Wehrmannsdamm 5-9
27245 Kirchdorf
Germany
Phone: +49 04273 89-0
Contact: www.dieseltechnic.com/contact

14 Transport Information

Land transport	Land transport (ADR/RID) UN N°: UN2794 class 8, Proper shipping name: BATTERIES, WET, FILLED WITH ACID electric storage Packing group ADR: not assigned Label required: corrosive ADR/RID: Batteries are exempted from all ADR/RID regulations, if requirements of special provision 598 are met. 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 aren't any dangerous traces or acids on the outside. » they are protected against short circuits.
Sea transport	See transport (IMDG Code) UN N°: UN2794 class 8. Proper shipping name: BATTERIES, WET, FILLED WITH ACID electric storage Packing group: not assigned EmS: F-A, S-B Label required: corrosive
Air transport	Air transport (IATA-DGR) UN N°: UN2794 class 8, Proper shipping name: BATTERIES, WET, FILLED WITH ACID electric storage Packing group: not assigned Label required: corrosive

15 Regulatory information

In accordance with Battery Directive 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.



The manufacturer, respectively the importer of the batteries shall be responsible for labelling batteries with the symbols. In addition, a consumer / user information on the significance of the symbols has to be attached.

16 Other information

16.1 Key or legend to abbreviations and acronyms

» AF - Assessment factor
» CLP - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures.
» DNEL - Derived no-effect level
» DSD - Council Directive 67/548/EEC (Dangerous Substances Directive)
» EC50 - Concentration of the substance that causes 50 % reduction of a certain effect on test organisms
» EWC - European Waste Catalogue
» LC50 -Concentration of the substance that causes 50 % mortality of the test population
» NOAEC - No observed adverse effect concentration
» NOAEL- No observed adverse effect level
» OECD - Organisation for Economic Co-operation and Development
» PBT/vPvB - Persistent, bioaccumulative and toxic/ very persistent and very bioaccumulative
» PNEC - Predicted no-effect concentration
» REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
» STOT RE - Specific Target Organ Toxicity, Repeated Exposure
» STOT SE - Specific Target Organ Toxicity, Single Exposure
» STP - Sewage treatment plant

16.2 Emergency telephone numbers

Europe-wide emergency number: 112

Contact a poison control centre. List of phone numbers:

AUSTRIA (Vienna Wien) +43 1 406 43 43; **BELGIUM** (Brussels Bruxelles) +32 70 245 245; **BULGARIA** (Sofia) +359 2 9154 409; **CZECH REPUBLIC** (Prague Praha) +420 224 919 293; **DENMARK** (Copenhagen) 82 12 12 12; **ESTONIA** (Tallinn) 112; **FINLAND** (Helsinki) +358 9 471 977; FRANCE (Paris) +33 1 40 0548 48; **GERMANY** (Berlin) +49 30 19240; **GREECE** (Athens Athinai) +30 10 779 3777; **HUNGARY** (Budapest) 06 80 20 11 99; **ICELAND** (Reykjavik) +354 525 111, +354 543 2222; **IRELAND** (Dublin) +353 1 8379964; **ITALY** (Rome) +3906 305 4343; **LATVIA** (Riga) +371 704 2468; **LITHUANIA** (Vilnius) +370 5 236 20 52 or +370 687 53378; **MALTA** (Valletta) 2425 0000; **NETHERLANDS** (Bilthoven) +31 30 274 88 88; **NORWAY** (Oslo) 22 591300; **POLAND** (Gdansk) +48 58301 65 16 or +48 58 349 2831; **PORTUGAL** (Lisbon Lisboa) 808 250 143; **ROMANIA** (Bucharest) +40 21 3183606; **SLOVAKIA** (Bratislava) +421 2 54 77 4166; **SLOVENIA** (Ljubljana) + 386 41 650500; **SPAIN** (Barcelona) +34 93 227 98 33 or +34 93 227 54 00 bleep 190; **SWEDEN** (Stockholm) 112 or +46 833 12 31 (mon-fri 9.00-17.00); **UNITED KINGDOM** (London) 112 or 0845 4647 (NHS Direct).

16.3 Disclaimer of Liability

The information in this data sheet for safe handling of lead-acid batteries is provided in good faith based on existing knowledge. However, the information is provided without any warranty, express or implied, regarding its correctness

The conditions or methods of handling, storage, use or disposal of the article are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the article. This data sheet was prepared and is to be used only for this article.

Articles such as batteries are not in the scope of any regulation which requires the publication of a safety data sheet according (EC) No. 1907/2006 (REACH), as amended by Annex I to Commission Regulation (EU) No. 453/2010.