



Lead-acid battery filled with diluted sulphuric acid

00377-0100

1. Identification

Product identifier

Lead-acid battery filled with diluted sulphuric acid

Further trade names

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

Recommended use of the chemical and restrictions on use

Use of the substance/mixture

Battery.

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

Details of the supplier of the safety data sheet

Company name: Robert Bosch GmbH
Automotive Aftermarket

Post-office box: 41 09 60
D-76227 Karlsruhe

Telephone: +49 721-942-0

Responsible Department: Responsible for the safety data sheet: sds@gbk-ingelheim.de

Emergency phone number: INTERNATIONAL: +49 - (0) 6132 - 84463, GBK GmbH (24h - 7d/w - 365d/a)

2. Hazard(s) identification

Classification of the chemical

29 CFR Part 1910.1200

Skin corrosion/irritation: Skin Corr. 1A

Serious eye damage/eye irritation: Eye Dam. 1

Reproductive toxicity: Repr. 1A

Reproductive toxicity: Lact.

Specific target organ toxicity repeated or prolonged exposure: STOT RE 1

Label elements

29 CFR Part 1910.1200

Signal word: Danger

Pictograms:



Hazard statements

Causes severe skin burns and eye damage

May damage fertility or the unborn child

May cause harm to breast-fed children

Causes damage to organs through prolonged or repeated exposure

Precautionary statements

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Do not breathe dust/fume/gas/mist/vapors/spray.

Avoid contact during pregnancy/while nursing.

Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.

Wear protective gloves/protective clothing/eye protection/face protection.



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If swallowed: Rinse mouth. Do NOT induce vomiting.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash contaminated clothing before reuse.

If inhaled: Remove person to fresh air and keep comfortable for breathing.

Immediately call a poison center/doctor.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

Immediately call a poison center/doctor.

If exposed or concerned: Get medical advice/attention.

Store locked up.

Dispose of contents/container to in accordance with local and national regulations.

Additional advice on labelling

There is no hazard when the measures for handling and storage are followed.

Hazards not otherwise classified

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

During the charging process they develop hydrogen gas and oxygen, which under certain circumstances may turn into an explosive mixture.

3. Composition/information on ingredients**Mixtures****Chemical characterization**

Battery (Lead)

Concentration of the absorbed, diluted sulphuric acid varies in accordance to the state of charge.

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

Hazardous components

CAS No	Components	Quantity
7439-92-1	lead powder [particle diameter < 1 mm] /	43 - 70 %
7664-93-9	Sulphuric acid	20 - 44 %

Further Information

Because of the cell structure the dangerous ingredients will not be available if used properly.

4. First-aid measures**Description of first aid measures****General information**

The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

After inhalation

Sulphuric acid:

- Ensure of fresh air.
- Consult a physician.

Lead paste:

- Ensure of fresh air.
- Consult a physician.

After contact with skin

Sulphuric acid:

- Rinse with plenty of water.
- Remove contaminated soaked clothing immediately.
- Consult a physician.

Lead paste:

- Wash off immediately with plenty of water and soap.





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- Consult a physician.

After contact with eyes

Sulphuric acid:

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

- Seek medical treatment by eye specialist.

Lead paste:

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

- Seek medical treatment by eye specialist.

After ingestion

Sulphuric acid:

- Drink plenty of water.

- Do not induce vomiting.

- Administration of activated charcoal.

- Call a physician immediately.

Lead paste:

- Rinse mouth.

- Consult a physician.

Most important symptoms and effects, both acute and delayed

No information available.

Indication of any immediate medical attention and special treatment needed

Treat symptoms.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

water, Carbon dioxide (CO₂), Dry fire-extinguishing substance.

Unsuitable extinguishing media

No information available.

Specific hazards arising from the chemical

No information available.

Special protective equipment and precautions for fire-fighters

Protective clothing: Tightly fitting goggles. Wear respiratory protection. Acid-resistant protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

Methods and material for containment and cleaning up

Take up with absorbent material (e.g. sand).

Neutralize with: Sodium carbonate.

Take up mechanically and collect in suitable container for disposal.

Waste disposal according to local regulations.

Reference to other sections

Information for safe handling look up chapter 7.

Information for personal protective equipment look up chapter 8.

Information for disposal look up chapter 13.

7. Handling and storage

Precautions for safe handling



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Advice on safe handling

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.
Follow the directions.

Further information on handling

Do not clean batteries with dry wishers, use only wet wishers.

Conditions for safe storage, including any incompatibilities**Requirements for storage rooms and vessels**

Store in a cool, covered place.

Charged lead-acid batteries do not freeze up to -50 °C.

Recommended storage temperature: room temperature.

Further information on storage conditions

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.

8. Exposure controls/personal protection**Control parameters****Exposure limits**

CAS No.	Substance	ppm	mg/m ³	f/cc	Category	Origin
7439-92-1	Lead inorganic (as Pb)	-	0.05		TWA (8 h)	REL
7439-92-1	Lead	-	0.050		TWA (8 h)	REL
			0.05		TWA (8 h)	ACGIH-2019
7664-93-9	Sulfuric acid (thoracic fraction)		0.2		TWA (8 h)	ACGIH-2019
7664-93-9	Sulfuric acid	-	1		TWA (8 h)	REL
		-	1		TWA (8 h)	REL

Biological Exposure Indices (BEI-ACGIH)

CAS No.	Substance	Determinant	Value	Test material	Sampling time
7439-92-1	LEAD	Lead	200 µg/L	blood	Not critical

Additional advice on limit values

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

Exposure controls**Protective and hygiene measures**

In case of electrolyte leakage:

Provide sufficient air exchange and/or exhaust in work rooms.

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

Eye/face protection

In case of electrolyte leakage:

Tightly fitting goggles. (are necessary during recharging also)

Hand protection

In case of electrolyte leakage:

Gloves made of nitrile. Recommended thickness of the material: 0,11 mm. Breakthrough time: > 480 minutes.

Skin protection

In case of electrolyte leakage:

Acid-resistant protective clothing

Respiratory protection

In case of electrolyte leakage:

In case of insufficient ventilation, wear suitable respiratory equipment



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9. Physical and chemical properties**Information on basic physical and chemical properties**

Physical state: Liquid (1), Solid (2)
Color: Colourless (1), Grey (2)
Odor: Odorless (1), Odorless (2)

pH-Value (at 25 °C): 0,3 (1), 7-8 (2)

Changes in the physical state

Melting point/freezing point: -35 - -60 (1), 327 (2) °C
Initial boiling point and boiling range: 108-144 (1), 1740 (2) °C
Flash point: Not combustible. (1)+(2) °C

Explosive properties

Not explosive. (1)+(2)

Vapor pressure: (at 20 °C) 14,6(1), - (2) hPa

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

Water solubility: (at 25 °C) 0,15 mg/l (2) g/L

Other information

(1) Sulphuric acid (20 - 44 %)

(2) Lead

10. Stability and reactivity**Reactivity**

Sulphuric acid:

Reactions with metals, with evolution of hydrogen.

Risk of formation of explosive hydrogen/air mixtures when stored in enclosed areas.

Destroys organic materials, such as cardboard, wood, textiles.

Chemical stability

Stability: Stable

Sulphuric acid :

Combustion temperature: 338 °C.

Possibility of hazardous reactions

Hazardous reactions: Will not occur

Sulphuric acid:

Gives off hydrogen by reaction with metals. Formation of explosive gas/air mixtures..

Conditions to avoid

No information available.

Incompatible materials

Sulphuric acid:

Vigorous reactions with alkalis.

Hazardous decomposition products

No decomposition if stored and applied as directed.

11. Toxicological information**Information on toxicological effects****Toxicocinetics, metabolism and distribution**

Lead paste:

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.





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Acute toxicity

Based on available data, the classification criteria are not met.

Sulphuric acid:

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

LD50/oral/rat: 2140 mg/kg (similar to OECD 401)

LC50/inhalativ/rat: 375 mg/m³ (OECD 403)

LD50/dermal: No data available

Lead paste:

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.

LD50/oral/rat: > 2000 mg/kg

LD50/dermal/rat: > 2000mg/kg

LC50/inhalativ/rat: > 5 mg/m³ (4h)

Irritation and corrosivity

Causes severe skin burns and eye damage

Causes serious eye damage

Sulphuric acid:

Causes severe skin burns and eye damage.

List substance Directive 67/548/EEC Annex I

Lead paste:

Skin: Studies of similar sparingly soluble inorganic lead compounds have shown that they are not corrosive or irritating to the skin of rabbits.

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

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

Sensitizing effects

Based on available data, the classification criteria are not met.

Sulphuric acid:

Not classified.

Lead paste:

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

Carcinogenic/mutagenic/toxic effects for reproduction

May damage fertility or the unborn child (lead powder [particle diameter < 1 mm] /)

May cause harm to breast-fed children (lead powder [particle diameter < 1 mm] /)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

Sulphuric acid:

Carcinogenicity: Not classified.

Mutagenicity: Not classified.

Reproductive toxicity: Inhalation, Rabbit, mouse: NOAEL 19,3 mg/m³ (OECD 414); Not classified.

Lead paste:

Carcinogenicity: 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).

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.

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.





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Specific target organ toxicity (STOT) - single exposure

Based on available data, the classification criteria are not met.

Sulphuric acid:

Not classified.

Lead paste:

Sparingly soluble inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, i contact with skin, and by inhalation.

Specific target organ toxicity (STOT) - repeated exposure

Causes damage to organs through prolonged or repeated exposure (lead powder [particle diameter < 1 mm] /)

Sulphuric acid:

Inhalation, Rat, NOAEL: 0,3 mg/m³ air (OECD 412); Not classified.

Lead paste:

Inorganic lead compounds are cumulative poisons and may be absorbed into the body through ingestion or inhalation.

Carcinogenicity (NTP): Lead (CAS 7439-92-1) is listed in group RAHC. Sulfuric Acid (CAS 7664-93-9) is listed in group Known.

Carcinogenicity (IARC): Lead (CAS 7439-92-1) is listed in group 2B. Sulfuric Acid (CAS 7664-93-9) is listed in group 1.

Carcinogenicity (OSHA): No ingredient of this mixture is listed.

Aspiration hazard

Based on available data, the classification criteria are not met.

Sulphuric acid:

Not classified.

Lead paste:

Not classified.

Practical experience

Other observations

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

12. Ecological information

Ecotoxicity

Sulphuric acid:

This substance is not classified as hazardous to the aquatic environment.

Aquatic toxicity

Fish, *Lepomis macrochirus*, LC50 (96h) > 16 - < 28 mg/l

Aquatic invertebrates, *Daphnia magna*, LC50 (48h) > 100 mg/l (OECD 202)

algae (Growth rate), *Desmodesmus subspicatus*, EC50 (72h) > 100 mg/l (OECD 201)

Fish, *Jordanella floridae*, NOEC (65d) 0,025 mg/l

Aquatic invertebrates, *Tanytarsus dissimilis*, NOEC 0,15 mg/l

Activated sludge, NOEC (37d) approx. 26 g/l

Lead paste:

This substance is classified as hazardous to the aquatic environment.

Persistence and degradability

Sulphuric acid:

Biodegradation

Not biodegradable. 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 hydrogen ions will react with and be neutralised by (OH) to form water. The sulphate ions are incorporated into the various mineral species present in the environment.

Chemical degradation



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Hydrolysis

Sulphuric acid is a strong mineral acid ($pK_a = 1.92$) that dissociates readily in water to hydrogen ions and sulphate ions (at environmentally relevant pH) and is totally miscible with water. At all environmentally relevant concentrations, the substance will therefore exist as the environmentally ubiquitous sulphate anion and hydronium cation, that reacts with hydroxyls to form water.

Phototransformation

Phototransformation will not occur.

Lead paste:

No information available.

Bioaccumulative potential**Sulphuric acid:**

Sulphuric acid is a strong mineral acid ($pK_a = 1.92$) 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.

Lead paste:

Inorganic lead is considered to be bioaccumulative in the environment, and may accumulate in aquatic and terrestrial plants and animals.

Bioconcentration factor (BCF), Fresh water: 4,553 l/kg (wet weight).

Bioconcentration factor (BCF), Soil : 0,39 kg/kg (dry weight).

Mobility in soil**Sulphuric acid:**

Sulphuric acid is a strong mineral acid ($pK_a = 1.92$) 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. The hydrogen ions will contribute to local pH and are potentially mobile.

Lead paste:

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.

Other adverse effects

No data available

13. Disposal considerations**Waste treatment methods****Disposal recommendations**

The point of sale, the manufacturers and importers of batteries take back used batteries, and render them to the secondary lead smelters for processing.

14. Transport information**US DOT 49 CFR 172.101****UN/ID number:**

UN 2794

Proper shipping name:

BATTERIES, WET, FILLED WITH ACID

Transport hazard class(es):

8

Hazard label:

8

Marine transport (IMDG)**UN number:**

UN 2794

UN proper shipping name:

Batteries wet filled with acid

Transport hazard class(es):

8

Packing group:

-

Hazard label:

8





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Limited quantity:
Excepted quantity:
EmS:

1 L
E0
F-A, S-B

Air transport (ICAO-TI/IATA-DGR)

UN number:

UN 2794

UN proper shipping name:

Batteries, wet, filled with acid

Transport hazard class(es):

8

Packing group:

-

Hazard label:

8



Limited quantity Passenger:
Passenger LQ:
Excepted quantity:

Forbidden
Forbidden
E0

IATA-packing instructions - Passenger:

870

IATA-max. quantity - Passenger:

30 kg

IATA-packing instructions - Cargo:

870

IATA-max. quantity - Cargo:

No limit

Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

Special precautions for user

Adhere to the instructions for use in order to avoid risks for man and environment.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

The transport takes place only in approved and appropriate packaging.

15. Regulatory information

U.S. Regulations

National regulatory information

SARA Section 302 Extremely hazardous substances:

Sulfuric acid (aerosol forms only) (7664-93-9): Reportable quantity = 1,000 lbs., Threshold planning quantity = 1,000 lbs.

SARA Section 304 CERCLA:

Lead (7439-92-1): Reportable quantity = 10 (4.54) lbs. (kg)

Sulfuric acid (aerosol forms only) (7664-93-9): Reportable quantity = 1,000 (454) lbs. (kg)

SARA Section 311/312 Hazards:

Lead (7439-92-1): Delayed (chronic) health hazard

Sulfuric acid (aerosol forms only) (7664-93-9): Immediate (acute) health hazard

SARA Section 313 Toxic release inventory:

Lead (7439-92-1): De minimis limit = None, Reportable threshold = 100 lbs.

Sulfuric acid (aerosol forms only) (7664-93-9): De minimis limit = 1.0 %, Reportable threshold = Standard

Clean Air Act Section 112(b):

Lead (7439-92-1)

State Regulations

Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65, State of California)

WARNING: This product can expose you to chemicals including Lead (cancer, developmental, reproductive), which are known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Additional information

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care.

16. Other information

Changes

Revision date: 06.04.2020

Revision No: 1,1

Changes in section: 2.3

Abbreviations and acronyms

IMDG = International Maritime Code for Dangerous Goods

IATA/ICAO = International Air Transport Association / International Civil Aviation Organization

MARPOL = International Convention for the Prevention of Pollution from Ships

DOT = Department of Transportation

TDG = Transport of Dangerous Goods

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

CAS = Chemical Abstract Service

ISO = International Organization for Standardization

LD = Lethal dose

LC = Lethal concentration

EC = Effect concentration

IC = Median immobilisation concentration or median inhibitory concentration

Other data

The information in this document is based on the present state of knowledge and is applicable to the product with regard to appropriate safety precautions. The information describes exclusively the safety requirements for the product (s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. (n.a. = not applicable; n.d. = not determined)

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)

