



Lead-acid battery filled with diluted sulphuric acid

00377-0089

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. 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.

1.2. Relevant identified uses of the substance or mixture and uses advised against

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.

1.3. Details of the supplier of the safety data sheet

Company name: Robert Bosch GmbH
Automotive Electronics
Street: Gerhard-Kindler-Str.3
Place: D-72770 Reutlingen
Telephone: +49 (0)7121 7666000

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

1.4. Emergency telephone +49 (0) 6132 / 84463 (GBK GmbH)

number:

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Hazard categories:

Acute toxicity: Acute Tox. 4

Acute toxicity: Acute Tox. 4

Skin corrosion/irritation: Skin Corr. 1A

Serious eye damage/eye irritation: Eye Dam. 1

Reproductive toxicity: Repr. 1A

Specific target organ toxicity - repeated exposure: STOT RE 1

Hazardous to the aquatic environment: Aquatic Chronic 1

Hazard Statements:

Harmful if swallowed.

Harmful if inhaled.

Causes severe skin burns and eye damage.

Causes serious eye damage.

May damage fertility. May damage the unborn child.

Causes damage to organs through prolonged or repeated exposure.

Very toxic to aquatic life with long lasting effects.

2.2. Label elements

Regulation (EC) No. 1272/2008

Hazard components for labelling

Lead

sulphuric acid ... %

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

Signal word: Danger

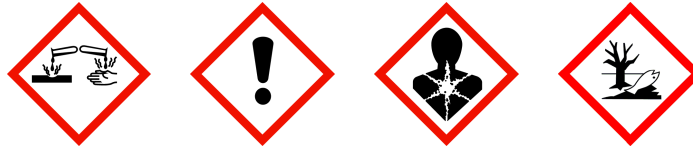




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Pictograms:



Hazard statements

- H302+H332 Harmful if swallowed or if inhaled.
- H314 Causes severe skin burns and eye damage.
- H360 May damage fertility or the unborn child.
- H372 Causes damage to organs through prolonged or repeated exposure.
- H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

- 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.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P263 Avoid contact during pregnancy and while nursing.
- P264 Wash Hands thoroughly after handling.
- P273 Avoid release to the environment.
- 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 or shower.
- P363 Wash contaminated clothing before reuse.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 IF exposed or concerned: Get medical advice/attention.
- P405 Store locked up.
- P501 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.

2.3. Other hazards

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

These batteries have two significant characteristics:

- They contain absorbed diluted sulphuric acid, which may cause severe acid burds, 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.

SECTION 3: Composition/information on ingredients

3.2. 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.



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Hazardous components

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	GHS Classification			
7439-92-1	Bleihaltige Batteriepaste			~ 32 %
	231-100-4		01-2119513221-59	
	Repr. 1A, Acute Tox. 4, Acute Tox. 4, STOT RE 1, Aquatic Chronic 1; H360Df H332 H302 H372 H410			
7439-92-1	lead powder [particle diameter < 1 mm]			~ 32 %
	231-100-4	082-013-00-1	01-2119513221-59	
	Repr. 1A, Lact., STOT RE 1, Aquatic Acute 1, Aquatic Chronic 1; H360FD H362 H372 H400 H410			
7664-93-9	sulphuric acid ... %			~ 29 %
	231-639-5	016-020-00-8	01-2119458838-20	
	Skin Corr. 1A; H314			
	Plastic container			~ 7 %

Full text of H and EUH statements: see section 16.

Further Information

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

SECTION 4: First aid measures**4.1. 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

Absorbed, diluted sulphuric acid:

- Ensure of fresh air.
- Consult a physician.

Lead paste:

- Ensure of fresh air.
- Consult a physician.

After contact with skin

Absorbed, diluted 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.
- Consult a physician.

After contact with eyes

Absorbed, diluted 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.





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After ingestion

Absorbed, diluted 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.

4.2. Most important symptoms and effects, both acute and delayed

No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptoms.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

water, carbon dioxide (CO₂), Dry chemical.

Unsuitable extinguishing media

No information available.

5.2. Special hazards arising from the substance or mixture

No information available.

5.3. Advice for firefighters

Protective clothing: Tightly fitting goggles (EN 166). Wear respiratory protection. Acid-resistant protective clothing..

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/ground water.

6.3. 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.

6.4. Reference to other sections

Information for safe handling look up section 7.

Information for personal protective equipment look up chapter 8.

Information for disposal see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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.

7.2. 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.



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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.

7.3. Specific end use(s)

Battery.

Note: This product is an "article".

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Exposure limits (EH40)**

CAS No	Substance	ppm	mg/m ³	fibres/ml	Category	Origin
-	Lead other than lead alkyls	-	0.15		TWA (8 h)	CLAW
7664-93-9	Sulphuric acid (mist)	-	0.05		TWA (8 h)	WEL

Biological Monitoring Guidance Values (EH40)

CAS No	Substance	Parameter	Value	Test material	Sampling time
7439-92-1	Lead (any other employee)	lead	35 µg/dl	blood	Random
7439-92-1	Lead (woman of reproductive capacity)	lead	20 µg/dl	blood	Random

Additional advice on limit values

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

8.2. 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 (EN 166). (are necessary during recharging also)

Hand protection

In case of electrolyte leakage:

Gloves made of nitrile. Recommended material thickness: 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

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state:	Liquid (1), Solid (2)
Colour:	Colourless (1), Grey (2)
Odour:	Odourless (1), Odourless (2)
pH-Value (at 25 °C):	0,3 (1), 7-8 (2)





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Changes in the physical state

Melting 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)

Vapour 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) Mischbar (1), 0,15 mg/l (2) g/L

9.2. Other information

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

(2) Lead

SECTION 10: Stability and reactivity

10.1. Reactivity

Absorbed, diluted 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.

10.2. Chemical stability

Absorbed, diluted sulphuric acid:

Decomposition temperature: 338 °C.

10.3. Possibility of hazardous reactions

Absorbed, diluted sulphuric acid:

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

10.4. Conditions to avoid

No information available.

10.5. Incompatible materials

Absorbed, diluted sulphuric acid:

Vigorous reactions with alkalies.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicokinetics, 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

Harmful if swallowed or if inhaled.

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/inhalation/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/inhalation/rat: > 5 mg/m³ (4h)

ATEmix calculated

ATE (oral) 1562,5 mg/kg; ATE (inhalation aerosol) 4,687 mg/l

Irritation and corrosivity

Causes severe skin burns and 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.

Sensitising 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. (Bleihaltige Batteriepaste; 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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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, in contact with skin, and by inhalation.

STOT-repeated exposure

Causes damage to organs through prolonged or repeated exposure. (Bleihaltige Batteriepaste; 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.

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.

SECTION 12: Ecological information

12.1. Toxicity

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.

12.2. 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

Hydrolysis

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. 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.





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Phototransformation

Phototransformation will not occur.

Lead paste:

No information available.

12.3. Bioaccumulative potential

Sulphuric acid:

Sulphuric acid is a strong mineral acid (pKa= 1.92) that dissociates readily in water to hydrogen ions and sulphate ions (at environmetally 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).

12.4. Mobility in soil

Sulphuric acid:

Sulphuric acid is a strong mineral acid (pKa= 1.92) that dissociates readily in water to hydrogen ions and sulphate ions (at environmetally 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 petentially 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.

12.5. Results of PBT and vPvB assessment

Sulphuric acid:

Sulphuric acid is neither a PBT nor a vPvB substance.

Lead paste:

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

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal

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

Waste disposal number of waste from residues/unused products

160601 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; batteries and accumulators; lead batteries; hazardous waste

SECTION 14: Transport information

Land transport (ADR/RID)

- | | |
|---|--------------------------------|
| <u>14.1. UN number:</u> | UN 2794 |
| <u>14.2. UN proper shipping name:</u> | Batteries wet filled with acid |
| <u>14.3. Transport hazard class(es):</u> | 8 |
| <u>14.4. Packing group:</u> | - |
| Hazard label: | 8 |



**Lead-acid battery filled with diluted sulphuric acid**

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Classification code: C11
 Special Provisions: 295 598
 Limited quantity: 1 L
 Excepted quantity: E0
 Transport category: 3
 Hazard No: 80
 Tunnel restriction code: E

Other applicable information (land transport)

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.

Inland waterways transport (ADN)

14.1. UN number: UN 2794
14.2. UN proper shipping name: Batteries wet filled with acid
14.3. Transport hazard class(es): 8
14.4. Packing group: -
 Hazard label: 8



Classification code: C11
 Special Provisions: 295 598
 Limited quantity: 1 L
 Excepted quantity: E0

Marine transport (IMDG)

14.1. UN number: UN 2794
14.2. UN proper shipping name: Batteries wet filled with acid
14.3. Transport hazard class(es): 8
14.4. Packing group: -
 Hazard label: 8



Special Provisions: 295
 Limited quantity: 1 L
 Excepted quantity: E0
 EmS: F-A, S-B

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number: UN 2794
14.2. UN proper shipping name: Batteries, wet, filled with acid
14.3. Transport hazard class(es): 8
14.4. Packing group: -
 Hazard label: 8



Special Provisions: A51 A164 A183 A802
 Limited quantity Passenger: Forbidden



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Passenger LQ:	Forbidden
Excepted quantity:	E0
IATA-packing instructions - Passenger:	870
IATA-max. quantity - Passenger:	30 kg
IATA-packing instructions - Cargo:	870
IATA-max. quantity - Cargo:	No limit

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

14.6. Special precautions for user

To avoid risks to human health and the environment, comply with the instructions for use.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

The transport takes place only in approved and appropriate packaging.

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**

Authorisations (REACH, annex XIV):

Substances of very high concern, SVHC (REACH, article 59):

Bleihaltige Batteriepaste; lead powder [particle diameter < 1 mm]

Restrictions on use (REACH, annex XVII):

Entry 30: Bleihaltige Batteriepaste; lead powder [particle diameter < 1 mm]

Additional information

In accordance with the 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, together with the ISO return / recycling symbol.

National regulatory information**Additional information**

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.

15.2. Chemical safety assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information**Abbreviations and acronyms**

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route

RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses

ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure

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

IBC-Code = International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

REACH = Registration, Evaluation, Authorization and Restriction of Chemicals

CAS = Chemical Abstract Service

EN = European norm

ISO = International Organization for Standardization

DIN = Deutsche Industrie Norm

PBT = Persistent Bioaccumulative and Toxic

LD = Lethal dose

LC = Lethal concentration

EC = Effect concentration

IC = Median immobilisation concentration or median inhibitory concentration





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Relevant H and EUH statements (number and full text)

H302	Harmful if swallowed.
H302+H332	Harmful if swallowed or if inhaled.
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H360	May damage fertility or the unborn child.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360FD	May damage fertility. May damage the unborn child.
H362	May cause harm to breast-fed children.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further Information

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities. 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.)

