

# Material Safety Data Sheet

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## 1. Product and Company Identification

**Brand:** ACCURAT  
**Series name:** ACCURAT Industrial (Wet batteries)  
**Manufacturer:** batterium GmbH  
Robert-Bosch-Straße 1, 71691 Freiberg am Neckar, Germany  
T: +49 7141 - 1410870 | F: +49 7141 / 560 90 49 | info@batterium.de  
batterium.de

**Models:**

I 250

I 270 DIN

I 270

I 330

I 460

I 195

I 100

I 110

I 140

I 165



## 2. Composition / Information on Ingredients

Component	Approx. percentage (weight)	CAS No.
Lead (Pb)	34%	7439-92-1
Lead dioxide (PbO <sub>2</sub> )	31%	1309-60-0
Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )	35%	7664-93-9

Percentages of components are dependant both on the model of the battery and state of charge/discharge of the battery. Sulfuric Acid and Lead are reportable under Sections 302, 311, 312 and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (40 CFR 355 and 372).

Wash hands thoroughly after working with batteries and before eating, drinking or smoking.

## 3. Hazards Summary

### DANGER!

- Harmful if swallowed, inhaled or in contact with skin
- Acid causes severe skin burns and eye damage
- May damage fertility or the unborn child if ingested or inhaled
- May cause harm to breast-fed children
- May cause cancer if ingested or inhaled
- Causes skin irritation, serious eye damage
- Contact with internal components may cause irritation or severe burns
- Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure if ingested or inhaled
- Irritating to eyes, respiratory system and skin
- May form explosive air/gas mixture during charging
- Extremely flammable gas (hydrogen)
- Explosive, fire, blast or projection hazard

### PRECAUTIONARY STATEMENTS

- Do not handle until all safety precautions have been read and understood
- Wash thoroughly after handling
- Do not eat, drink or smoke when using this product
- Avoid contact during pregnancy/while nursing
- Wear protective gloves/protective clothing, eye protection/face protection
- Avoid breathing dust/fume/gas/mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Avoid contact with internal acid
- Do not breathe dust/fume/gas/mist/vapors/spray
- Keep away from heat/sparks/open flames/hot surfaces

- If swallowed or consumed: Rinse mouth; Do not induce vomiting; Call poison center / doctor if you feel unwell
- If on clothing or skin (or hair): Remove / take off immediately all contaminated clothing and wash it before reuse; Rinse skin (hair) with water/shower
- If inhaled: Remove person to fresh air and keep comfortable for breathing; Immediately call poison center or doctor
- If in eyes: Rinse cautiously with water for several minutes; Remove contact lenses if present and easy to do; Continue rinsing; If exposed/concerned or if you feel unwell seek medical attention/advice
- Store locked up, in a well ventilated area, in accordance with local and national regulation
- Dispose of contents/container in accordance with local and national regulation
- Keep out of reach of children

**Sulfuric Acid:** Under normal conditions of use, Sulfuric Acid vapors and mist are not generated. Sulfuric Acid vapors may be generated when the product is overheated, oxidized or otherwise processed or damaged.

**Lead Compounds:** Under normal conditions of use, lead dust, vapors and fumes are not generated. Hazardous exposure may occur when the product is overheated, oxidized or otherwise processed or damaged to create dust, vapor or fumes.

**Other:** May form explosive air/gas mixture during charging.

**Routes of entry and potential health effects:**

**Inhalation:** Sulfuric acid vapors or mist may cause severe respiratory irritation. Lead dust or fumes may cause irritation of upper respiratory tract or lungs.

**Skin contact:** Sulfuric acid may cause severe irritation, burns and ulceration. Lead Compounds are not readily absorbed through the skin.

**Eye contact:** Sulfuric acid may cause severe irritation, burns and cornea damage and possible blindness. Lead Compounds may cause eye irritation.

**Ingestion:** Sulfuric acid may cause severe irritation of mouth, throat, esophagus and stomach. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue and pain in the arms, legs and joints.

## 4. First Aid Measures

**Inhalation:** Move the affected person to fresh air. If they are not breathing, administer artificial respiration. Seek medical attention.

**Skin contact:** Immediately remove contaminated clothing and shoes. Wash off affected area with plenty of water. Consult a physician.

**Eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes. Consult a physician.

**Ingestion:** Do not induce vomiting. Rinse mouth and drink plenty of water. Do not administer anything by mouth to an unconscious person. Consult a physician.

## 5. Fire Fighting Measures

Flash point:	N/A
Flammable limits:	Lower 4.10% (Hydrogen gas) Upper 74.20%
Extinguishing media:	Dry chemical, foam, halon or CO <sub>2</sub>

### Special Fire Fighting Procedures:

If batteries are charging, turn off power. Use positive pressure, self-contained breathing apparatus in fighting fire. Water applied to electrolyte generates heat and causes it to splatter. Wear acid resistant clothing. Ventilate area well.

### Unusual Fire and Explosion Hazards:

Hydrogen and oxygen gases are generated in cells during normal battery operation or when charging. (Hydrogen is flammable and oxygen supports combustion). These gases enter the air through the vent caps during battery overcharging.

To avoid risk of fire or explosion, keep the battery away from sparks and other sources of ignition. Do not allow metal objects to simultaneously contact both positive and negative terminal of a battery.

Ventilate the area well.

## 6. Accidental Release Measures

Neutralise any spilled or leaked acid using alkaline agents (lime, sodium carbonate, soda). Keep untrained personnel away from the broken battery and spilled electrolyte. Place the broken battery and collected materials in a plastic bag or other non-metallic container. Dispose of the collected materials as a hazardous waste. Ventilate area as hydrogen gas may be given off during neutralization. Always dispose of any neutralised acid in accordance with national, state and local regulations. In case any packaging materials are soiled with acid, neutralise the acid and rinse the materials before disposal.

## 7. Handling and Storage

Handling:	Use the attached handle if available; otherwise carefully lift the battery from underneath. Handle with care. Never lift a battery by its terminals.
Storage:	Store in cool, dry area away from combustible materials. Do not store in sealed, unventilated areas. Avoid overcharging. Store at temperatures between -20°C and +40°C.
Precautions:	The batteries contain diluted sulphuric acid. Prevent any risk of short circuits. Do not charge in unventilated areas. Do not use organic solvents or other than recommended chemical cleaners on battery.

## 8. Exposure Controls/Personal Protection

Chemical	OSHA PEL	NIOSH (US)	ACGIH	OEL EU
Lead and Lead Compounds (inorganic)	0.05	0.05	0.05	0.15 (a)
Sulfuric Acid (electrolyte)	1	1	0.2	0.05 (b)

(a) as inhalable aerosol      (b) thoracic fraction

**General:** Normal room ventilation is sufficient during normal use and handling. Two to three room air changes per hour are recommended to prevent buildup of hydrogen gas.

If the battery has been damaged, observe the following protective measures:

**Respiratory protection:** Use a full-face, supplied air respirator.

**Eye protection:** Wear safety glasses with wide side shields.

**Hand protection:** Wear chemical resistant gloves.

**Body protection:** Protective work clothing and boots.

Remove jewelry, rings, watches and any other metallic objects while working on batteries. All tools should be adequately insulated to avoid any possibility of short circuits. Do not lay tools on top of the battery. Be sure of discharge static electricity from tools and individual persons by touching a grounded surface in the vicinity of the batteries.

Batteries are heavy. Serious injury can result from improper lifting or installation. Do not lift, carry, install or remove cells by lifting or pulling the terminal posts. Do not wear nylon clothes or overalls as they can create static electricity. Always keep a class C fire extinguisher and emergency communications device in the work area.

Wash hands thoroughly after working with batteries and before eating, drinking or smoking.

## 9. Physical and Chemical Properties

### ELECTROLYTE

**Boiling point:** 110°C - 121°C

**Evaporation rate:** < 1 (Butyl acetate = 1)

**Vapor pressure (mm Hg):** 10

**Vapor density:** > 1 (air = 1.0)

**Solubility in water:** 100%

**Appearance and odor:** Liquid, sharp, pungent odor, colorless

**Specific Gravity:** 1.215 to 1.350 (water = 1.0)

**pH:** 1 to 2

**Lower explosive limit:** 4.1% (Hydrogen)

**Upper explosive limit:** 72.2% (Hydrogen)

**Flash point:** Below room temperature (as hydrogen gas)

## 10. Stability and Reactivity

<b>Chemical stability:</b>	Stable under recommended conditions.
<b>Conditions to avoid:</b>	Sparks and other sources of ignition. Prolonged overcharge. Fire and explosion hazards due to possible hydrogen gas generation. Short circuits. Water.
<b>Incompatibilities:</b>	Combination of sulfuric acid with combustibles and organic materials may cause fire and explosions. Avoid strong reducing agents, most metals, carbides, chlorates, nitrates, picrate.
<b>Hazardous decomposition products:</b>	Hydrogen gas may be generated when the batterie is being overcharged, in fire or at very high temperatures. CO, CO <sub>2</sub> and sulfuric oxides may be emitted during a fire. Hazardous polymerization will not occur.

## 11. Toxicological Information

The International Agency for Research on Cancer (IARC) has classified strong inorganic acid mist containing sulfuric acid as a Category 1 carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric forms of sulfuric acid or sulfuric acid solutions contained within the battery. Inorganic acis mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may however result in the generation of sulfuric acid mist

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions.

Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis.

Lead is listed by International Agency for Research on Cancer (IARC) as Group 2A likely in animals at extreme doses; this is approximately equivalent to GHS Category 1B. Proof of carcinogenicity in humans is currently lacking.

### Acute Toxicity:

	Inhalation	Oral
Sulfuric acid (electrolyte)	LC <sub>50</sub> rat: 375 mg/m <sup>3</sup>	LD <sub>50</sub> rat: 2140 mg/kg
Lead (elemental)	Acute toxicity point estimate = 4500 ppmV (based on lead bullion)	Acute toxicity estimate (ATE) = 500 mg/kg body weight (based on lead bullion)

## 12. Ecological Information

Lead is very persistent in soil and sediment, however there is no data on environmental degradation. The mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain (most studies include lead compounds and not elemental lead).

<b>Sulfuric Acid</b>	24 hr LC50, freshwater fish (Brachydanio rerio)	82 mg/L
<b>Sulfuric Acid</b>	96 hr LOEC, freshwater fish (Cyprinus carpio)	22 mg/L
<b>Lead</b>	48 hr LC50 (modeled for aquatic invertebrates)	<1 mg/L (based on lead bullion)

### 13. Disposal Considerations

Always dispose of batteries in accordance with national, state and local regulations.

**Spent batteries:** Send to secondary lead smelter for recycling; spent lead-acid batteries are not regulated as hazardous waste when the requirements of 40 CFR Section 266.80 are met. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).

**Electrolyte:** Place neutralized slurry into sealed acid-resistant containers and dispose of as hazardous waste, as applicable. Large water diluted spills, after neutralization and testing, should be managed in accordance with local, provincial/state and national/federal requirements. Following local, provincial / state and national / federal regulations applicable to end of life characteristics will be the responsibility of the end user.

### 14. Transport Information

Proper Shipping Name:	Batteries, wet, filled with acid
Hazard Class:	8
UN ID Number:	UN2794
DOT Packing Group:	III
Labels :	Corrosive
IATA DGR Reference :	IATA Packing Instruction 870 (IATA DGR 56th Edition)
IMDG Code Reference :	IMDG Code Packing Instruction P801

The US Department of Transportation (DOT) hazardous materials regulations (49 CFR) applicable to lead acid batteries are specified in 49 CFR 173.159.

49 CFR 173.159(e) specifies that when transported by highway or rail, electric storage batteries containing electrolyte or corrosive battery acid / fluid are not subject to any other requirements of this subchapter, if all of the following are met:

- (1) No other hazardous materials may be transported in the same vehicle.
- (2) The batteries must be loaded or braced so as to prevent damage and short circuits during transit.
- (3) Any other material loaded in the same vehicle must be blocked, braced or otherwise secured to prevent contact with or damage to the batteries.
- (4) The transport vehicle may not carry material shipped by any other person other than the shipper of the batteries.

If any of the above-referenced requirements are not met, the batteries must be shipped as fully-regulated Class 8 Corrosive hazardous materials.

### 15. Regulatory Information

This product has been classified in accordance with the hazard criteria of the Controlled Products regulations (CPR) and the SDS contains all information required by Controlled Products Regulations.

Distribution within Canada to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

Industrial lead-acid batteries, such as those used in forklifts, do NOT meet the OSHA definition of an 'article' (US EPA, Oct 1998). Therefore, the lead and acid that compose these batteries must be included when determining the various thresholds for these EPCRA (Emergency Planning & Community Right-to-Know Act) section regulations. The acid in lead-acid batteries is sulfuric acid, which is an Extremely Hazardous Substance (EHS). The following table outlines the applicable EPCRA sections and their respective thresholds for sulfuric acid:

EPCRA Sections	Thresholds
302 – Emergency Planning Notification	TPQ ≥ 1000 lbs
304 – Emergency Release Notification	RQ ≥ 1000 lbs
311 – MSDS Reporting	*TPQ ≥ 500 lbs
312 – Chemical Inventory Reporting (i.e. Tier II)	*TPQ ≥ 500 lbs

\* The reporting threshold for sulfuric acid is ≥ the designated TPQ (Threshold Planning Quantity) or 500 lbs, whichever is less.

The lead used in lead-acid batteries does not qualify for any OSHA or EPCRA exemptions. Lead is not an EHS and the following table outlines the applicable EPCRA sections and their respective thresholds for lead:

EPCRA Sections	Thresholds
311 – MSDS Reporting	≥ 10,000 lbs
312 – Chemical Inventory Reporting (i.e. Tier II)	≥ 10,000 lbs

### EPCRA Section 313:

The reporting of lead and sulfuric acid (and their releases) in lead-acid batteries used in cars, trucks, most cranes, forklifts, locomotive engines and aircraft for the purposes of EPCRA Section 313 is not required. Lead-acid batteries used for these purposes are exempt for section 313 reporting per the “Motor Vehicle Exemption”. See page B-22 of the US EPA Guidance Document for Lead and Lead Compound Reporting under EPCRA Section 313 for additional information of this exemption.

This product contains toxic chemicals that may be reportable under EPCRA Section 313 Toxic Chemical release Inventory (Form R) requirements.

## 16. Other Information

NFPA Hazard rating for sulfuric acid:

Flammability (Red) = 0

Health (Blue) = 3

Reactivity (Yellow) = 2

The information given above is provided in good faith based on present knowledge and does not constitute an assurance of safety under all conditions. It's the users responsibility to observe all laws and regulations applicable. We make no warranty of merchantability or any other warranty, expressed or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall we be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or expemprary damages, howsoever arising, even if we have been advised of the possibilty of such damages. If there are any queries, the supplier should be consulted. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.