Date	Review	Modification
28/03/2008	0	Initial elaboration
22/09/2010	1	Topic 8 review – Storage precautions
21/03/2013	2	General review
07/05/2014	3	General review
29/06/2015	4	General review
21/12/2017	5	Review for adequacy of the latest version of the standard NBR-14725-3
01/10/2019	6	Review for adequacy of the new Tudor logo
29/10/2019	7	General review
15/03/2023	8	Adaptation of the header and unification of the content (English and Spanish versions)
17/07/2023	*9*	*General review*

1. IDENTIFICATION

Product's name: Storage Battery wet
Synonymus Lead / Acid Battery
Manufacture's name: Tudor SP Batteries Industry LTDA
Address: 2-130, Jose Pinelli, street – Distrito Industrial II – Bauru/SP - Brazil – CEP 17039-741
Home Page: www.tudor.com.br
Information: (+55) 14 3103-5530 / (+55) 33 2101-2400
Emergency: 0800-135530 (24 horas)
Product Description / Use: Electric Storage Battery

2. HAZARDS INDETIFICATION

2.1 Hazard classification of the substance or mixture (Classification according to ABNT 14725-2)

The hazards described in the table below pertain to internal Battery components.

Hazard	*Category*	*Warning Words*	*Hazard phrase*	*Precaution phrases*
Acute oral toxicity	***Category 4*** *(lead and its compounds)*	*Attention*	*H302*	*P264* *P270* *P301 + P312* *P330* *P501*
Acute toxicity - Inhalation	***Category 4*** *(lead and its compounds)*	*Attention*	*H332*	*P261* *P271* *P304 + P340* *P312*
Skin corrosion	***Category 1A*** *(Sulfuric acid)*	*Hazard*	*H314*	*P260* *P264* *P280* *P301 + P330 + P331* *P303 + P361 + P353* *P363* *P304 + P340 + P310* *P321* *P305 + P351 + P338* *P405* *P501*
Corrosive to metals	***Category 1*** *(Sulfuric acid)*	*Attention*	*H290*	*P234* *P390* *P406*
Serious eye damage	***Category 1*** *(Sulfuric acid)*	*Hazard*	*H318*	*P280* *P305 + P351 + P338* *P310*
Carcinogenicity	***Category 1B*** *(lead and its compounds)*	*Hazard*	*H350*	*P201* *P202* *P280* *P308 + P313* *P405* *P501*
	Category 2 *(Sulfuric acid)*	*Attention*	*H351*	
Reproduction toxicity	***Category 1A*** *(lead and its compounds)*	*Hazard*	*H360*	

Hazard	***Category***	***Warning Words***	***Hazard phrase***	***Precaution phrases***
Effects on or via lactation	*Additional category (lead and its compounds)*	*Not required*	*H362*	*P201 P260 P263 P264 P270 P308 + P313*
Systemic target organ toxicity - Single exposure	***Category 3***	*Attention*	*H335*	*P261 P271 P304 + P340 P312 P403 + P233 P405*
Systemic target organ toxicity – Repeated exposure	***Category 1***	*Hazard*	*H372*	*P260 P264 P270 P314 P501*
Hazard to the aquatic environment - Acute toxicity	***Category 1*** *(lead and its compounds)*	*Attention*	*H400*	*P273 P391 P501*
Hazard to the aquatic environment - Chronic toxicity	***Category 1*** *(lead and its compounds)*	*Attention*	*H410*	

2.2 Apropriate elements for labeling

(Labeling according to ABNT 14725-2)

Risk pictograms

Warning words: danger

Hazard phrases

H290	Can be corrosive to metals
H302	*Can be harmful if swallowed*
H314	*Causes severe skin burns and eye damage*
H318	*Cause serious eye damage*
H332	*Can be harmful if inhaled*
H335	Can cause irritation of the respiratory tract
H350	*can cause cancer*
H351	Suspected of causing cancer
H360	*May harm fertility or the fetus*
H362	*May be harmful to breast-fed infants*
H372	Causes damage to organs (lungs, central nervous system, blood, kidneys, liver, stomach) through prolonged or repeated exposure
H400	*Very toxic to aquatic organisms*
H410	*Very toxic to aquatic organisms with long lasting effects*

Precaution phrases

Prevetion

P201	Obtain specific instructions before use.
P202	Do not handle the product until you have read and understood all safety precautions.
P234	*Keep only in the original container.*
P260	Do not inhale Dust / fumes / gases / mists / vapors / aerossol.
P261	Avoid inhaling dusts / fumes / gases / mists / vapours / aerossol.
P263	*Avoid contact during pregnancy/breastfeeding.*
P264	Wash thoroughly after handling.
P270	*Do not eat, drink or smoke while using this product.*
P271	*Use only outdoors or in a well-ventilated area.*
P272	Contaminated work clothes cannot leave the workplace.
P273	Avoid releae to the environment.
P280	Wear protective gloves / protective clothing / eye protection / face protection.

Emergency responses

P301 + P312	*IF SWALLOWED: Immediately call a TOXICOLOGICAL INFORMATION CENTER / doctor.*
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 / shower.
P304 + P340	*IF INHALED: Remove person to a well-ventilated area and keep at rest in a position comfortable for breathing.*
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. If you wear contact lenses, remove them if that's Easy. Keep rinsing.
P308 + P313	*IF exposed or suspected of exposure: Consult a doctor.*
P310	*Immediately call a TOXICOLOGICAL INFORMATION CENTER or a doctor.*
P312	*If you feel unwell, contact an INFORMATION CENTER TOXICOLOGICAL/doctor.*
P321	*Specific treatment for sulfuric acid.*
P330	*rinse your mouth*
P363	*Take off all contaminated clothing and Wash it before reuse*
P390	Absorb spilled product to avoid material damage.
P391	Collect spilled material

Storage

P403 + P233	*Store in a well-ventilated place. Keep container tightly closed.*
P405	Store in a locked key.
P406	Store in a corrosion / resistant container with a Strong inner çiner.

Disposal

P501	Discard the product in na appropriate place, which must be collected by certified and authorized bodies.

2.3 Other Hazards

- In case off ire, the product can form lead and plastic (polypropylene) vapors
- Explosion can occur in cases of excessive overload or improper charging procedure

3. COMPOSITION AND INFORMATION

3.1. Mixture

Ingredients or impurities that contribute to the hazard

CAS #	COMMOM NAME	Concentration (m/m%)
7439-92-1	Lead	30 – 35 %
7664-93-9	Sulfuric acid	30 – 35 %
1309-60-0	Lead dioxide	25 – 30 %
7446-14-2	Lead sulfate	< 1 %

4. FIRST – AID MEASURES

Skin	Sulfuric Acid: Flush exposed skin with large amounts of water for 15 minutes. Remove contaminated clothing. seek medical care Lead: Wash off immediately with soap and water
Eyes	Sulfuric Acid and Lead: Rinse with clean, cold, running water for 15 minutes. Do not use eye drops or other medication unless directed by a doctor. Seek medical care immediately
Inhalation	Sulfuric Acid: Immediately remove to fresh air. If not breathing, apply artificial respiration. If breathing is difficult, give oxygen. Consult a doctor. Lead: Remove from exposure. Gargle with water. Wash your nose and lips. Consult a doctor
Ingestion	Sulfuric Acid: Give large amounts of water. Do not induce vomiting or aspiration into the lungs, permanente injury or death may result. Consult a doctor. Lead: Consult a doctor immediately.

4.1 Most importante symptoms and effects, both acute and delayed

- Causes skin irritation with redness, pain and dryness;
- Causes eye burns, tearing and pain;
- May cause dermatitis and itching;
- Repeated exposure may cause damage to the respiratory and digestive systems;
- May be fatal if swallowed.

5. FIRE MEASURES

Means of extinction	**Adequate means of extinction:** Carbon dioxide (CO2), foam, water mist and chemical powder. **Not adequate means of extinction:** DO NOT use water jet
Product specific hazards	During the burning process, it can form irritating and toxic gases such as carbon monoxide and carbon dioxide, as well as sulfuric acid vapors and mists; lead metal fumes and plastic fumes. It can cause explosions in case of overload or misuse of the product. See explosive limit in section 9.
Protective measures for firefighting personel.	Self-contained breathing apparatus (SCBA) with positive pressure and full protective clothing. Containers and warehouses involved in the fire must be cooled with water mist. If the battery is on charge, disconnect the chargers and pay attention to the risk of shock, especially in the case of a bank of batteries connected in series

6. SPILL OR LEAK CONTROL MEASURES

Personal precautions for personnel who are part of the emergency service	Isolate the leak with absorbent pads. Do not smoke. Do not touch damaged containers or spilled product without proper protective clothing. Use protective equipment as per section 8.
Personal precautions for non-emergency personnel	*Avoid inhaling dust. Do not breathe vapors or aerosols. Avoid contact with the substance. Ensure adequate ventilation. Evacuate danger area, observe emergency procedures, consult specialist.*
Precautions for the einvironment	Prevent spilled product from reaching waterways and sewers.
Methods and materials for cleaning and containment	Stop flow of material, contain/absorb small spills with dry sand or earth. Do not use combustible materials. Carefully neutralize electrolyte with baking soda, quicklime or ash. Neutralized acid must be disposed of in accordance with requirements approved by regulatory bodies.

7. HANDLING AND STORAGE

7.1 Safe handling precautions

Safe handling recommendation	Unless you are involved in recycling operations, do not tamper with the box or empty the contents of the battery. Do not tilt batteries at an angle greater than 45°. Never recharge the battery in an enclosed, unventilated space. Use a battery holder to lift a battery or use your hands in opposite corners to avoid spilling acid solution through top openings. When installing the correct position of the negative and positive poles, incorrect use may cause short circuit and low-intensity electric shock. Keep ventilation caps and cover terminals to prevent short circuits. Place cardboard between layers of stacked car batteries to prevent damage and short circuits. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.
Hygiene measures	Do not smoke or eat while handling. Wash hands after handling, before eating, smoking or going to the toilet.

7.2 Conditions for safe storage, including incompatibilities

- Keep the batteries away from metallic objects that could come into contact with the terminals;
- Handle carefully and avoid tilting that could allow electrolyte leakage;
- A single battery may have no risk of electric shock, but there may be an increased risk of electric shock from connected battery wires that exceed three 12 Volt units.

Fire and explosion prevention	Keep the batteries in a horizontal position in relation to the base. Away from sources of ignition.
	Stack the batteries to prevent accidental contact with the terminal.
	Whenever possible, store and transport on pallets or shelves.
	Do not stack loaded pallets or shelves on top of other batteries.
	Store batteries in covered, dry, well-ventilated areas and keep them away from incompatible materials and activities that may create flames, sparks or heat.
	Store on smooth, impermeable surfaces that are provided with measures to retain liquids in case of electrolyte spills.
	Keep material to neutralize the electrolyte in or near the storage area for emergency use.
	Avoid storage in areas that may heat up from solar formation.
	When batteries are completely discharged, the electrolyte will freeze when stored below -6°C
	Fully charged batteries can be stored at temperatures below -6°C

8. EXPOSURE CONTROLS

8.1 Control parameters

Lead (7439-92-1)
BR OEL
Time weighted average (TWA): 0,1 mg/m^3

US ACGIH
Time weighted average (TWA) 0,05 mg/m^3

NR7 – PCMSO
occupational exposure limit: 0,6 µg/ 100 mL (Blood)

Sulfuric Acid (7664-92-1)
BR OEL
Time weighted average (TWA): 0,2 mg/m^3
Form of exposure: thoracic fraction

Lead dioxide (1309-60-0)
US ACGIH
Time weighted average (TWA): 0,05 mg/m^3
(as lead)

Lead sulfate (7446-14-2)
US ACGIH
Time weighted average (TWA): 0,05 mg/m^3
(as lead)

8.2 Engineering control measures

Store and handle in a well-ventilated area. If mechanical ventilation is used, the components must be acid resistant. Handle batteries carefully, do not tilt them to avoid spillage. Make sure the ventilation caps are in place. If the battery case is damaged, avoid body contact with internal components. Wear protective clothing, eye and face protection when filling, charging or handling batteries. Do not allow metallic materials to contact the positive and negative battery terminals simultaneously. Charge batteries in areas with adequate ventilation. General dilution ventilation is acceptable.

8.3 Individual protection measures

Eyes/face protection
Wide vision goggles with side shields.

Skin protection
Sulfuric acid resistant waterproof protective clothing, Safety or rubber ¾ boots and protective gloves made of rubber or PVC

Breath protection
For normal handling of the finished product it is not necessary, but when concentrations of sulfuric acid mist are known to exceed the occupational exposure limit (see section 8.1), a mask with a chemical filter against acid gases and vapors must be used.

9. PHYSICAL CHEMICAL PROPERTIES

Aspect	Manufactured article; no apparent odor. The electrolyte is a sulfuric acid solution, a clear liquid with a pungent, penetrating odor.
Odor and odor limit	Pungent (electrolyte)
pH	<1 (electrolyte)
Fusion point	327 °C (Lead)
initial boiling point	Not applicable unless internal components are exposed. 103-115°C (electrolyte) 1755° (lead)
flash point	Below ambient temperature (for hydrogen gas – H_2)
Evaporation rate	< 1 (butyl acelate =1)
Flammability (solid; gas)	Flammable (for hydrogen gas – H_2)
Lower explosive limit	4% (for hydrogen gas – H_2)
Upper explosive limit	74% (for hydrogen gas – H_2)
Steam pressure	10 mmHg
vapor density	>1 (air= 1)
Specific density	1,220 – 1,310 g/cm^3 (electrolyte)
Solubility	100% (electrolyte) Lead and lead dioxide are not soluble.
Partition coefficient – n-octanol/water	Not applicable
Autoignition temperature	580 °C (hydrogen)
Decomposition temperature	Not applicable I
Viscosity	Not available

10. STABILITY AND REACTIVITY

10.1 Reactivity
See section 10.3

10.2 Chemical stability
This product is considered stable under normal temperature and pressure conditions.

10.3 Possibility of hazardous reactions
Under overcharge conditions it produces hydrogen gas wich is flammable and can cause the baterry to explode.
In cases of electrolyte leakege (sulphuric acid solution) there is a risk of Explosion and/or formation of toxic gas.

10.4 Conditions to avoid
Avoid unapproved recharging procedures and excessive overloading.
Avoid strong impacts that could damage the box and cause electrolyte leakage. Do not open, break or melt the case.
Keep away from sources of ignition/sparks.
Do not cause a short circuit.

10.5 Incompatible materials
Electrolyte: Contact with combustibles and organic materials can cause fire and explosion. Also reacts violently with strong reducing agents, metals/metal alloys, sulfur trioxide gas, strong oxidizers and water. Contact with metals can produce toxic sulfur dioxide gases and release flammable hydrogen gas.

Lead Compounds: Avoid contact with strong acids, strong bases, halides, halogenates, potassium nitrate, permanganate, peroxides and reducing agents.

10.6 Hazardous decomposition products
Electrolyte: sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.

Lead Compounds: Temperatures above the melting point can produce toxic lead fumes. Contact with strong acids and bases can generate toxic gases.

11. TOXICOLOGY INFORMATION

Note: Under normal conditions of use, this product poses no health hazard. The following information is provided for exposure to electrolyte (sulfuric acid solution) and lead compounds, which may occur due to container breakage or under extreme conditions such as fire.

a)	**Acute toxicity**	Symptoms: Sulfuric Acid: Severe skin irritation, corneal damage, upper respiratory irritation. Toxicity estimate: LD50: 2140 mg/kg (rats, ORAL) LC50: 3 mg/m^3/ 24 weeks (humans, INHALATION) Lead compounds: Headache, fatigue, abdominal pain, loss of appetite, muscle aches and weakness, sleep disturbances and irritability
b)	**Corrosion/irritation**	Causes severe skin irritation. May be corrosive to metals (sulfuric acid).
c)	**Serious eye Damage**	Causes serious eye damage (sulfuric acid)
d)	**Respiratory or skin sensitization**	Sulfuric Acid**:** Breathing sulfuric acid vapors or mists may cause severe irritation respiratory Lead: Inhaling lead dust or fumes may cause respiratory traction irritation
e)	**Mutagenicity in germ cells**	Not available.
f)	**Carcinogenicity**	Suspected of causing cancer.
g)	**Reproduction toxicity**	Not available.
h)	**Toxicity for target organs Specif - unique exposure**	Not available
i)	**Toxicity for organs-specific target - repeated exposure**	Lead: May cause damage to organs (blood, central nervous system) through exposure repeated target organs / extension.
j)	**Aspiration hazard**	Not available

Medical conditions aggravated by exposure
Overexposure to sulfuric acid mist can cause lung damage and worsen lung conditions.
The contact of sulfuric acid with the skin can aggravate conditions such as eczema and contact dermatitis.
Lead and its compounds can aggravate some forms of kidney, liver, and neurological disease.

Additional health data
All heavy metals, including the hazardous ingredients in this product, are absorbed into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by proper precautions, such as ventilation and respiratory protection, discussed in Section 8.
This product is intended for industrial use only and must be isolated from children and their environment.

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity
Toxic to aquatic and terrestrial organisms.

Electrolyte:
24 h LC50 – Brachydanium rerio (zebrafish): 82 mg/L.
48 h EC50 – Daphnia magna (water flea or daphnia): >100 mg/L.

Lead:
48 h LC50 (modeled for aquatic invertebrates): <1 mg/L, based on lead rods.

12.2 Persistence and degradability
Lead is very persistent in soil and sediment. There is no data available on environmental degradation.
The mobility of metallic lead between ecological compartments is slow.
Most studies include both lead and non-elemental lead compounds.

12.3 bioaccumulative potential
Sulfuric acid has a low potential for bioaccumulation in aquatic organisms.

BCF (for concentrated sulfuric acid): 3.16 (estimated value).
Log kow (for concentrated sulfuric acid): -2.20 (estimated value).

Lead bioaccumulation occurs in aquatic and terrestrial animals and plants, but little bioaccumulation occurs through the food chain.

12.4 Soil mobility
Low mobility in soil (lead).

12.5 Other adverse effects
There are no effects on stratospheric ozone depletion.

Electrolyte: Forms corrosive mixtures with water even when diluted. Harmful effect due to pH change. Danger in drinking water supply if allowed to enter soil or aquifers.

13. FINAL DESTINATION CONSIDERATIONS

13.1 Recommended methods for final disposal

Comply with the guidelines on Reverse Logistics.
Batteries are completely recyclable and must be sent to an authorized recycler.
Dispose of insertable batteries and/or their waste in accordance with applicable federal, state and local regulations.

14. TRANSPORT

14.1 National regulations

Terrestrial
Resolution No. 5998 of November 03, 2022, of the National Agency for Land Transport (ANTT).

Waterway
Resolution No. 2239 of September 15, 2011 of the National Agency for Waterway Transport (ANTAQ).

Air
Ordinance ANAC No. 2.156 of November 4, 2011 of the National Aviation Agency Civil (ANAC).

14.2 Information for product classified as dangerous for transport

a) No. UN: 2794.
b) Proper Shipping Name: Electric Batteries, wet, containing Acid.
c) Main and subsidiary risk class/subclass: 8 - Corrosive Substances.
d) Risk Group: 80
e) Other specific information:
- Not known as a marine pollutant for water, land or air transport
- Special label or marking requirements: CORROSIVE

15. REGULATORY INFORMATION

Specific regulations for the chemical	Ordinance MTP No. 2.770 of september 05, 2022 Amends the Standard Regulatory No. 26
	Federal Decree No. 6911 of 1935
	Federal Decree No. 3665 of 2000
	INMETRO Ordinance No. 328, of August 8, 2011
	ABNT NBR 14725

16. OTHERS INFORMATIONS

This MSDS was prepared based on current knowledge about the proper handling of the product under normal conditions of use and according to the application specified on the packaging. Failure to comply with the above information exempts INDÚSTRIAS TUDOR-SP DE BATERIAS LTDA. liability for misuse of the product.

In the work environment, it is up to the user company to promote the training of its workers.