臺灣湯淺電池股份有限公司 Taiwan Yuasa Battery Co., Ltd.
NO.11, LANE 227, FUYING RD., HSINCHUANG DISTRICT, NEW TAIPEI CITY, TAIWAN, R.O,C.
TEL: (02)2901-8261 FAX:(02)2903-9626

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Trade name	Valve Regulated Lead Acid Battery （NP、NPH、NPX、NPW、NPA、NPL、RE、REW、REC、U1、UXH、UXL、UXW、SW、SWH、SWL、SUL、FNPA、FXH、FXC、FXL、TRE、UPZ、PW、PYL、PWL）
Relevant identified uses	Rechargeable Storage Batteries
Company / identification	Taiwan Yuasa Battery Co., Ltd.
Address	No.11, Ln. 227, Fuying Rd., Xinzhuang District, New Taipei City, Taiwan
Emergency telephone	886-2-29018261

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture		
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]		
Hazardousness	Charging a battery generates hydrogen and oxygen gases. Exposure of fire to them may catch a fire，resulting in an explosion.	
Poisonousness	Exposure of electrolyte to skin or an eye may result in a burn or a loss of eyesight.	
	Lead	Sulfuric acid
Hazard classification	Germ cell mutagenicity（Category 2） Carcinogenicity（Category 2） Reproductive toxicity（Category 1A） Specific target organ toxicity - repeated exposure（Category 1）	Acute toxicity, oral （Category 5） Acute toxicity, inhalation（Category 2） Corrosive to metals（Category 1） Skin corrosion/irritation（Category 1） Serious eye damage/eye irritation（Category 1）
Pictogram	 Health hazard	  Corrosion Skull and crossbones
Signal word	Danger	Danger
Hazard statement(s) H314	Suspected of causing genetic defects Suspected of causing cancer May damage fertility or the unborn child Causes damage to organs through prolonged or repeated exposure	Harmful if swallowed Fatal if inhaled Harmful if swallowed Causes severe skin burns and eye damage Causes serious eye damage
Precautionary statement(s)	P403 Store in a well-ventilated place P309+P311 IF exposed or if you feel unwell：Get medical advice/attention. P501 Dispose of contents/container to an approved waste disposal plant.	P280 Wear protective gloves/ protective clothing/ eye protection/ face protection P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

3. COMPOSITION / INFORMATION ON INGREDIENTS

Identification of substance			
Identification of single - or mixed substance product：Mixed-substance product			
Components	Compositions	Approximate%	CAS Number
Plate	Lead and lead compounds（Pb & PbO_2）	65-75%	7439-92-1（Pb）

	Barium compound（Ba^{++}）	0.3% or below	7440-39-3（Ba）
Electrolyte	abt. 40% dilute sulfuric acid（$H_2SO_4+H_2O$）	15-25%	7664-93-9
Battery container / Cover	ABS resin（synthetic resin）	5-15%	9003-56-9
	Antimony trioxide（Sb_2O_3）	2% or below	1309-64-4
	Tetrabromobisphenol A	4% or below	79-94-7
Separator	Glass Fiber	1-3%	65997-17-3
Other metal parts	Brass etc.	1% or below	63338-02-3
Other resin parts	PP	1-5%	9003-07-0
	Epoxy resin		25068-38-6 00108-95-2
	Rubber		25038-36-2

4. FIRST AID MEASURES

When electrolyte is inhaled	Move to a place full of fresh air and have immediate medical treatment.
When electrolyte is swallowed	Immediately rinse the mouth with a large quantity of fresh water，and drink another large quantity of fresh water. Then，have immediate medical treatment.
When electrolyte is attached to skin	Immediately wash it down with a large quantity of water，and thoroughly wash the skin with soap. If there is a fear of burn，have immediate medical treatment.
When electrolyte contacts the eyes	Immediately flush the eye sufficiently with water，and have immediate medical treatment.

5. FIRE-FIGHTING MEASURES

Fire fighting method	Extinguish a fire using a fire extinguisher of dry powder agent，foam agent or non-combustible gas.

6. ACCIDENTAL RELEASE MEASURES

Action at The Time of Electrolyte Leak or Outflow：

Neutralize the leaked electrolyte with soda bicarbonate or slaked lime，then wash it down.（At that time，be sure to wear protective goggles，gloves，and boots.）

7. HANDLING AND STORAGE

Handling	● Do not disassemble or modify the battery，nor short it between the terminals. ● Do not put a fire close to the battery，or throw it into a fire. ● Handle batteries as heavy objects. ● With vents provided in a cubicle，for example，charge the battery in a well ventilated

	room.
Storing	Choose a place that is not exposed to high temperatures，high humidity，wind and rain，direct sunlight，fire，poisonous gasses，droplets，dust generation or ingress，or submersion.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls	Store batteries with adequate ventilation. Room ventilation is also required for batteries utilized for standby power generation. Never recharge batteries in an unventilated, enclosed space.
Personal Protective Equipment	During installation, normal conditions of use or in the event of battery breakage, no exposure to lead and lead containing battery paste. Exposure to sulfuric acid and acid mist might occur during charge.
Eye Protection	Chemical goggles, safety glasses with side shields and or a full-face shield.
Protective gloves	Rubber, PVC or neoprene.
Respiratory Protection	NIOSH approved acid mist/organic vapor respirator, if OSHA PEL is exceeded.
Other Protective Equipment	Acid resistant apron or clothes.
Work Practices	Use standard lead-acid battery practices. Do not wear metallic jewelry when working with batteries. Use non-conductive tools only. Discharge static electricity prior to working on a battery. Maintain eyewash, fire extinguisher and emergency communication device in the work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Materials（reference）	Dilute sulfuric acid（for 1.3 of specific gravity）	Lead	ABS resin
Other appearance	Transparent liquid	Silver white solid	Black or Gray solid
Specific gravity	1.30	11.3	1.20
Boiling point	110℃	1,740℃	—
Melting point	-40℃	327℃	Soften point: about 130-150 ℃
Freezing point	-56.4℃		—
Vapor pressure	3.17 kPa（for 30% concentration at 30℃）	0.1 kPa（at 25℃）	—

10. STABILITY AND REACTIVITY

Stability	The battery and its contents are stable but need to avoid several situations during usage, such as overheating, overcharging which results in acid mist and hydrogen generation. Hydrogen gas may be generated from overcharging, fire or at very high temperatures, especially CO, CO2 and Sulfur Oxides may emit during in fire. Hence, some materials also should be avoid placing together with batteries, for example, strong alkaline materials, organic solvents, or conductive metals caused sparks or open flame.
Reactivity	Once batteries are breakage, split sulphuric acid should be careful which is corrosive, nonflammable liquid (thermal decomposition at 338℃ and destroys organic materials such as cardboard, wood, textiles and reacts with metals, producing hydrogen.

11. TOXICOLOGICAL INFORMATION

VRLA batteries are sealed, recombinant design that require no water replacement throughout their service life, thus no contact is made with the battery's internal components or chemical hazards. Under normal use and handling, these batteries do not emit regulated or hazardous substances.	
Inhalation, rat	LC50 = 510 mg/m3/2H
Oral, rat	LD50 = 2140 mg/kg
Carcinogenicity	The International Agency on Cancer (IARCC) has classified "strong inorganic acid mists containing sulfuric acid" as a category 1 carcinogen (inhalation), a substance that is carcinogenic to humans. This classification does not apply to the liquid forms of sulfuric acid contained within the battery. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist at high levels.

12. ECOLOGICAL INFORMATION

This information is of relevance if the battery is broken and the ingredients are released to environment.	
Electrolyte （dilute sulfuric acid）	In order to avoid damage to the sewage system, the acid has to be neutralized by means of time or sodium carbonate before disposal. Ecological damage is possible by change of pH. The electrolyte solution reacts with water and organic substances, causing damage to flora and fauna. The electrolyte may also contain soluble components of lead that can be toxic to aquatic environments.
Lead and Lead compounds	Chemical and physical treatment is required for the elimination from water. Waste water containing lead must not be disposed of in an untreated condition. The former classification of Lead compounds as toxic for the aquatic environment R50/53 had been triggered from test results generated in the 80's for soluble Lead compounds (Lead Acetate). The hardly soluble Lead compounds such as Battery Lead Oxide were not tested at this time. Tests on Battery Lead Oxide were carried out in 2001 and 2005.

	The respective test results conclude that Battery Lead Oxide is not toxic for the environment, neither R50 nor R50/53 nor R51/53. From this it follows that the general classification for Lead compounds (R50/53) does not apply to Battery Lead Oxide. As the result of this the Risk Phrase R52/53 (Harmful to aquatic organisms, may cause longterm adverse effects in the aquatic environment) applies to Battery Lead Oxide.
	Effects of Battery Lead Oxide in the aquatic environment：
	Toxicity for fish — 96 h LC 50 > 100 mg/l
	Toxicity for daphnia — 48 h EC 50 > 100 mg/l
	Toxicity for alga — 72 h IC 50 > 10 mg/l
	The results demonstrate these Battery Lead Oxide compounds in a concentration of 100 mg/l have no adverse effect on fish and daphnia. A concentration of these Battery Lead Oxide of 10 mg/l has no adverse effect on the rate of growth and the biomass. For the classification according to Directive 67/548/EEC the most sensitive adverse effect has to be considered. As a result of the toxicity for alga at > 10 mg/l Battery Lead Oxide has to be classified according to the R-Phrases 52/53 (Harmful to aquatic organisms. may cause long term adverse effects in the aquatic environment).

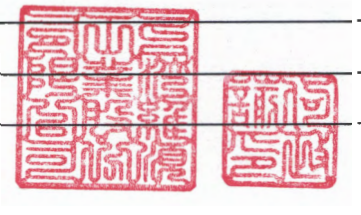
13. DISPOSAL CONSIDERATIONS

Spent lead acid batteries are subject to regulation of the EU Battery Directive and its adoptions into national legislation on the composition and end of life management of batteries.

Spent Lead Acid batteries are recycled in lead refineries (secondary lead smelters). The components of a spent Lead Acid battery are recycled or reprocessed.

At the points of sale, the manufacturers and importers of batteries, respectively the metal dealers take back spent batteries, and render them to the secondary lead smelters for processing.

To simplify the collection and recycling or reprocessing process, spent Lead Acid batteries must not be mixed with other batteries. By no means may the electrolyte (diluted sulfuric acid) be emptied in an inexpert manner. This process is to be carried out by the processing companies only.



14. TRANSPORT INFORMATION

Air Transportation

Proper Shipping Name： Batteries, wet, non-spillable

UN Identification： UN2800

Hazardous Class： 8

Special Provision A48：Packing Test are not considered necessary.

Special Provision A67：Yuasa's VRLA batteries meet the requirements of Packing Instruction 872.

The battery has been prepared for transport so as to prevent:

a) A short-circuit of the battery's terminals by packing in a strong and sturdy carton box; AND/OR

b) The batteryhas been fitted with an insulating cover (made from ABS) which prevents contact with the terminals.

c) Unintentional activation is thus prevented

The words "NOT RESTRICTED" and the special Provision (SP) number must beindicated on all shipping documents

Special Provision A164：

Any electrical battery or battery powered device, equipment or vehicle having the potential of a dangerous of heat must be prepared for transport so as to prevent：

（a） a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals); and

（b） unintentional activation

Special Provision A183：

Waste batteries and batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

Marine Transportation

Proper Shipping Name： Batteries, wet, non-spillable

UN Identification： UN2800

Hazardous Class： 8

Yuasa VRLA batteries have been tested and meet the non-spillable criteria listed in IMDG Code Special Provision 238.1 and 2；therefore, are not subject to the provisions of the IMDG Code provided that the battery terminals are protected against short circuits when packaged for transport.

Transportation between USA and Canada

US DOT：No proper shipping name；not regulated as a hazardous material.

Yuasa VRLA batteries have been tested and meet the non-spillable criteria listed in CFR 49, 173. 159 (d) (3) (i) and (ii).

Non-spillable batteries are excepted from CFR 49, Subchapter C requirements, provided that the following criteria are met：

1. The batteries must be protected against short circuits and securely packaged.
2. The batteries and their outer packaging must be plainly and durably marked "NON-SPILLABLE" or "NONSPILLABLE BATTERY".

Additional Information：

- Each battery and the outer packaging must be plainly and durably marked "Non-Spillable" or "Non-Spillable Battery".
- Transport requires proper packaging and paperwork, including the nature and quantity of goods, per applicable origin / destination / customs points as-shipped.

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15. REGULATORY INFORMATION

In accordance with EU Battery Directive and the respective national legislation, Lead Acid batteries have to be marked by a crossed out dust bin with the chemical symbol for lead shown below, together with the ISO return/recycling symbol. If other countries or the region have time in addition the stipulation must observe.

16. OTHER INFORMATION

Sulfuric acid is water-reactive if concentrated.

The following battery compositions is listed in TSCA（Toxic Substance Control Act（U.S.A.））

Components		CAS No	TSCA lists the state
Electrolyte	sulfuric acid（H_2SO_4+H_2O）	7664-93-9	Listed
Inorganic lead Compound	Lead（Pb）	7439-92-1	Listed
	lead compounds（PbO_2）	1317-36-8	Listed
	Lead sulfate（$PbSO_4$）	7446-14-2	Listed
	Calcium (Ca)	7440-70-2	Listed
	Tin（Sn）	7440-31-5	Listed
	Barium（Ba）	7440-39-3	Listed
Battery container & Cover	Antimony trioxide (Sb_2O_3)	1309-64-4	Listed
	Tetrabromobisphenol A（$C_{15}H_{12}Br_4O_2$）	79-94-7	Listed

California Prop 65

Battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the state of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

RoHS Instruction

Lead and lead compound contained in the lead-acid battery is off the subject of the RoHS instruction.

All statements described here are based on the materials, information, and date collected at this point. Thereby, the above statements may not reflect the most updated information. All the substances may include un-described hazardous substances. All statements described here do no guarantees that all the possible hazardous substance is included. In addition, please read the warning and notes on caution label before using rechargeable battery.

If you have any questions regard to rechargeable battery or the MSDS content, please contact us for further information.