## SECTION 1: IDENTIFICATION OF THE PRODUCT AND OF THE MANUFACTURER/SUPPLIER

| | | |
|---|---|---|
| **1.1** | **Product Identifier:** | **Valve Regulated Lead-Acid (VRLA) Industrial Battery** |
| | **Classification:** | Battery, wet, Non-Spillable, electric storage<br>Substance classification: UN 2800 |
| | **Product Codes:** | EN & ENL, NP, NPC, NPH, NPL, NPW, RE, REC, REW, *SW, SWL, TEV, FXH, UXH, UXL, Yucel, YPC and YFT Series of Industrial VRLA Batteries |
| **1.2** | **Relevant identified uses of the product and uses advised against** | *Relevant identified uses*:<br>*Product is a source of electrical energy for use with electrical and electronic equipment, including;<br>Standby: Telecoms; UPS; alarm and security systems; emergency lighting; utility switching<br>Cyclic: Golf Trolleys, portable tools, portable lighting, wheelchairs, remote telemetry<br>Energy storage: Photovoltaic energy systems (PVES); wind turbines |
| | | *Uses advised against:*<br>Automotive, commercial, and agricultural SLI applications<br>*Reason why uses advised against:*<br>High starting and ignition current demands beyond the design of internal and external current carrying components |
| **1.3** | **Details Of The Supplier Of The Safety Date Sheet** | **Supplier:** **Yuasa Battery Europe Ltd,**<br>**Address**: Unit 22, Rassau Industrial Estate, Ebbw Vale, NP23 5SD, United Kingdom<br><br>**Contact:** **Peter HOLLINGWORTH (Technical Support Manager)**<br>Tel: (+44) 01495 354 062<br>e-mail: peter.hollingworth@yuasaeurope.com<br>Language: English language only<br>Available: *Office hours only: 8am to 4:30pm (08:00 to 16:30) – GMT (CET -1h ) |
| | **National Contacts:** | France:<br>Contact: Christian RAYNAUD (Technical Manager)<br>Tel: (+33) 0474-95-90-95<br>e-mail: christian.raynaud@yuasa.fr<br>Language: French & English<br>Available: *Office hours only: 8:30am to 5pm (08:30 to 17:30) – CET |
| | | Germany:<br>Contact: Joachim HEER (UPS / Project Manager)<br>Tel: (+49) 0211-41790-15<br>e-mail: joachim.heer@yuasa-battery.de<br>Language: German & English<br>Available: *Office hours only: 8:30am to 5pm (08:30 to 17:00) – CET |
| | | Iberia:<br>Contact: Antonio PULIDO MARTINEZ (Director Commercial Industrial)<br>Tel: (+34) 091-748-89-19<br>e-mail: antonio@yuasaiberia.com<br>Language: Spanish & English<br>Available: *Office hours only: 8:30am to 6pm (08:30 to 18:00) – CET |
| | | Italy:<br>Contact: Marco FILIPPI (Technical Manager)<br>Tel: (+39) 02-3800-91-08<br>e-mail: marco.filippi@yuasa.it<br>Language: Italian & English<br>Available: *Office hours only: 8:30am to 5:30pm (08:30 to 17:30) – CET |
| | | UK:<br>Contact: Matt JORDAN (Technical Services Manager)<br>Tel: (+44) 01793-833-562<br>e-mail matt.jordan@yuasaeurope.com<br>Language: English language only<br>Available: *Office hours only: 9am to 5pm (09:00 to 17:00) – GMT (CET -1h ) |
| **1.4** | **Emergency telephone number:** | Contact: **Mike TAYLOR (Product Manager)**<br>Tel: **(+44) 07733 302 242**<br>e-mail mike.taylor@yuasaeurope.com<br>Language: English language only<br>Available: Office hours only: 8am to 4:30pm (08:00 to 16:30)* – GMT (CET -1h ) |

## SECTION 2: HAZARDS IDENTIFICATION

| | | | |
|---|---|---|---|
| | **VRLA Battery** | *Non-Hazardous:- The VRLA Battery presents no chemical hazards during the normal operation provided YUASA recommendations for handling, storage, transport and usage are observed. | |
| **2.1** | Classification according to CLP Regulation (EC) No 1272/2008 | *This product does not meet the criteria for classification in any hazard class according to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. However a safety data sheet is being supplied for it to meet customer's requirements for similar information. | |
| **2.1.1** | **Additional information** | *The following information is offered for general hazard considerations. | |
| | | **Mechanical** | VRLA Batteries can be heavy. Correct manual handling techniques and/or mechanical lifting aides (e.g. Fork Lift Truck) must be used. |
| | | **Electrical** | VRLA Batteries can contain large amounts of electrical energy which can give very high discharge currents and severe electrical shock if the terminals are short circuited. |
| | | **Chemical** | • VRLA Batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approx. 4% to 76%. This can be ignited by a spark at any voltage, naked flames or other sources of ignition.<br>• If the battery is broken and the internal components exposed, hazards may exist which require careful attention. |
| **2.1.2** | ***In case of accidental damage causing cracks, splits or rupture of the battery case** | | |
| | **Plate grids and active materials** | • **Metallic Lead, Lead alloys and Lead inorganic compounds:**<br>• Lead poisoning is usually caused by inhalation of minute particles of Lead fume and dust, which are absorbed by the blood stream from the lungs and deposited in the bone marrow.<br>• Lead is only slowly released from the bones and thus has an accumulative effect causing chronic poisoning.<br>• TOXIC by ingestion or inhalation of dust, vapour or fume<br>• May cause harm to the unborn child<br>• Harmful by inhalation and if swallowed<br>• Danger of cumulative effects | |
| | **Battery electrolyte** | ***Dilute Sulphuric acid**<br>Severe IRRITATION and DAMAGE to internal tissues if swallowed,<br>IRRITATION of eyes and skin and may cause BURNS and DERMATITIS. | |
| | **Battery case material** | ***ABS (Acrylonitrile-Butadiene-Styrene Copolymer)**<br>Standard Grade, UL94:HB & Flame Retardant (FR) Grade, UL94:V0.<br>No hazard in normal use.<br>Material can burn in a fire with toxic smoke and decomposition products. | |
| | **Separator material** | ***Absorbent Glass Matt (AGM) Separator**<br>The fibres may cause IRRITATION to skin or eyes upon exposure, and to internal tissues if inhaled or swallowed | |

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

| | | | | | | |
|---|---|---|---|---|---|---|
| **3.1** | **Substances present in the product** | | | | | |
| | **Components** | ***Hazard Statement[1]** | Substances | Approximate % ( $^{w}/_{w}$ ) | Chemical Symbol | CAS No. |
| | **Plate Grid** | **H301**<br>**H331** | Metallic Lead | 30 to 40 | Pb | 7439-92-1 |
| | | | Calcium | < 0.1 | Ca | 7440-70-2 |
| | | | Tin | < 2 | Sn | 7440-31-5 |
| | **Active Materials** | **H301**<br>**H311**<br>**H331** | Lead Monoxide | < 0.1 | PbO | 1317-36-8 |
| | | | Lead Dioxide (Lead IV Oxide) | 35 to 45 | $PbO_2$ | 1309-60-0 |
| | | | Barium compound | < 1.5 | Ba | 7440-39-3 |
| | **Battery Electrolyte** | **H302 ; H312**<br>**H314 ; H315**<br>**H319 ; H332**<br>**H335** | Dilute Sulphuric Acid | 10 to 20 | $H_2SO_4$ | 7664-93-9 |
| | **Case Material** | | **Standard Grade, UL94:HB**<br>• ABS (Acrylonitrile-Butadiene-Styrene Copolymer) | 5 to 10 | | 9003-56-9 |
| | | | **Flame Retardant (FR) Grade, UL94:V0**<br>• ABS (Acrylonitrile-Butadiene-Styrene Copolymer) | 5 to 10 | | 9003-56-9 |
| | | | • Tetrabromobisphenol-A-diglycygilether, with tribromophenol | < 0.1 | | 40039-98-8 |
| | | | • Antimony trioxide | < 0.01 | | 1309-64-4 |
| | **Separator Material** | **H315 ; H319**<br>**H335 ; H351** | Absorbent Glass Matt (AGM) Separator (100% Borosilicate Glass Microfibre) | 2 to 5 | | 65997-17-3 |
| | Inorganic lead and battery electrolyte (Dilute Sulphuric Acid) are the main components of VRLA batteries. Other substances may be present but in small amounts dependant on battery type. Contact Yuasa Battery UK Ltd for further information. | | | | | |

[1] For full text of Hazard Statements (H-No's) see SECTION 16

## SECTION 4: FIRST AID MEASURES

This information is of relevance only if the VRLA Battery has suffered damage, is broken and persons have direct contact with the internal components.

| **4.1** | **Description of first aid measures** | | |
|---|---|---|---|
| | **Components** | | **Action** |
| | **Plate Grids and Active materials** | Inhalation: | Remove the person from exposure to fresh air.<br>Seek advice from a medical doctor |
| | | Ingestion | Wash out mouth with water and give plenty of water to drink. Do not induce vomiting.<br>Seek advice from a medical doctor |
| | | Skin Contact: | Wash off with plenty of water and soap to prevent accidental ingestion or inhalation<br>Seek medical advice if pain or rash does not reduce |
| | | Eye Contact: | **Immediately** irrigate with eyewash solution or clean water for at least 10 minutes, holding the eyelids apart. Then take the person to hospital without further delay |
| | | Self-protection for the first aider | Eye protection (safety glasses or face shield), and heavy-duty gloves are required.<br>In case of inhalation, a face mask or respirator may be required. |
| | **Battery Electrolyte** | | **SPEED IS ESSENTIAL - OBTAIN IMMEDIATE MEDICAL ATTENTION.** |
| | | Inhalation: | Remove the person from exposure to fresh air.<br>If the person continues to feel unwell seek advice from a medical doctor. |
| | | Ingestion | Wash out mouth with water and give plenty of water to drink. Do not induce vomiting.<br>If the person continues to feel unwell seek advice from a medical doctor. |
| | | Skin Contact: | Drench *the area with large quantities of water.<br>Remove contaminated clothing and place in water to dilute the acid<br>Continue to wash the affected area for at least 10 minutes.<br>Seek advice from a medical doctor |
| | | Eye Contact: | **SPEED IS ESSENTIAL - OBTAIN IMMEDIATE MEDICAL ATTENTION**<br>**Immediately** irrigate with eyewash solution or clean water for at least 10 minutes, holding the eyelids apart. Then take the person to hospital without further delay |
| | | Self-protection for the first aider | Eye protection (safety glasses or face shield), and heavy-duty gloves are required.<br>In case of inhalation, a face mask or respirator may be required. |
| | **Case Material** | Inhalation: | Material can burn in a fire with toxic smoke and decomposition products.<br>Upon inhalation of decomposition products, keep patient calm, remove to fresh air, and seek advice from a medical doctor. If a large quantity is inhaled take the person to hospital.<br>**Note to physician**: Treat according to symptoms (decontamination, vital functions), no known specific antidote. |
| | | Ingestion | Wash out mouth with water and give plenty of water to drink. Do not induce vomiting.<br>If the person continues to feel unwell seek advice from a medical doctor. |
| | | Skin Contact: | Areas affected by molten material should be quickly placed under cold running water and a sterile protective dressing applied.<br>Seek advice from a medical doctor. |
| | | Eye Contact: | May cause irritation or injury due to mechanical action and traces of Battery Electrolyte.<br>**Immediately** irrigate with eyewash solution or clean water for at least 10 minutes, holding the eyelids apart. Then take the person to hospital without further delay |
| | | Self-protection for the first aider | Eye protection (safety glasses or face shield), and disposable gloves are required.<br>In case of inhalation, a face mask or respirator may be required. |
| | **Separator Material** | Inhalation: | Remove patient from exposure to fresh air. If irritation persists, seek advice from a medical doctor |
| | | Ingestion | Wash out mouth with water and give plenty of water to drink. Do not induce vomiting. If the person continues to feel unwell seek advice from a medical doctor. |
| | | Skin Contact: | After contact with skin, wash immediately with plenty of soap and water. If irritation persists, seek advice from a medical doctor |
| | | Eye Contact: | May cause irritation or injury due to mechanical action and traces of Battery Electrolyte.<br>**Immediately** irrigate with eyewash solution or clean water for at least 10 minutes, holding the eyelids apart. Then take the person to hospital without further delay |
| | | Self-protection for the first aider | Eye protection (safety glasses or face shield), and disposable gloves are required.<br>In case of inhalation, a face mask or respirator may be required. |

## SECTION 5: FIRE-FIGHTING AND EXPLOSION HAZARD MEASURES

| | | | |
|---|---|---|---|
| **5** | **VRLA Battery** | General Information | • VRLA Batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approx. 4% to 76%. This can be ignited by a spark at any voltage, naked flames or other sources of ignition.<br>• Batteries in use will be part of an electrical circuit and must be isolated from the power source before attempting to put out a fire. Switch the power **OFF** before disconnecting the batteries from the power source.<br>• Damaged batteries may expose negative plates, grey in colour, which may ignite if allowed to dry out. These plates may be wetted down with water after the battery has been removed from all electrical circuits. |
| **5.1** | ***Extinguishing media** | Suitable extinguisher types: | $CO_2$; Foam; Dry Powder. |
| | | Unsuitable extinguisher types | Water extinguishers must never be used to put out an electrical fire. |
| **5.2** | ***Special hazards** | Hazardous combustion & decomposition products: | Carbon monoxide, Sulphur Dioxide, Sulphur Trioxide, Lead fume and vapour, toxic fumes from decomposition of battery case materials. |
| **5.3** | ***Advice for fire-fighters** | | Full face visor or safety goggles;<br>Respiratory equipment or self-contained breathing apparatus (SCBA);<br>Full acid resistant protective clothing must be worn in fire-fighting conditions. |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

This information is of relevance only if the VRLA Battery has suffered damage and is broken.

| | | | |
|---|---|---|---|
| **6** | **Components** | | |
| | **VRLA Battery** | *General Information | VRLA batteries are designed to be safe to handle and not to leak battery electrolyte under normal conditions.<br>In case of accidental damage heavy-duty gloves are required to pick-up the battery to protect against unseen electrolyte leakage *and sharp components |
| | **Plate Grids and Active Materials** | 6.1 Personal Precautions: | Eye protection (safety glasses or face shield), and heavy-duty gloves are required.<br>If the material is wet, a face mask or respirator is not required<br>If the material is dry, a face mask or respirator is required |
| | | 6.2 Environmental Precautions: | Do not allow material to enter a watercourse. Exposed Lead *compounds must be placed in an inert sealed container (e.g. self-seal plastic bag or bucket) for disposal, see Section 13. |
| | | 6.3 Methods & material for containment and cleaning-up | Large, solid pieces may be picked up and bagged for recycling.<br>Never use a brush to sweep up debris; it may create Lead-dust in the air.<br>Wet clean the spill area to remove all traces of debris. Battery debris and cleaning materials must be collected and placed in an inert sealed container (e.g. self-seal plastic bag or bucket) for disposal, see Section 13. |
| | **Battery Electrolyte:** | 6.1 Personal Precautions: | Ensure suitable, acid resistant personal protective clothing (including heavy-duty gloves, safety glasses and respiratory protection) is worn during removal and clean-up of spillages. |
| | | 6.2 Environmental Precautions: | Battery electrolyte must not be allowed to enter any drains or sewage system or water course. |
| | | 6.3 Methods & material for containment and cleaning-up | <u>Small spillages:</u><br>Neutralise and absorb the spillage using soda ash, sodium bicarbonate (available from supermarkets), sodium carbonate or calcium carbonate powder.<br>Wet clean the spill area to remove all traces of debris. Battery debris and cleaning materials must be collected and placed in an inert sealed container (e.g. self-seal plastic bag or bucket) for disposal, see Section 13.<br><u>Large spillages:</u><br>Large amounts of electrolyte spillage are unlikely with VRLA batteries since the electrolyte is fully absorbed in the active materials and separator.<br>Bund the spillage area using dry sand, earth, sawdust or other inert material.<br>Neutralise the electrolyte using soda ash, sodium bicarbonate (available from supermarkets), sodium carbonate or calcium carbonate powder.<br>Wet clean the spill area to remove all traces of debris and electrolyte.<br>Cleaning materials must be collected and placed in an inert sealed container (e.g. self-seal plastic bag or bucket) for disposal, see Section 13. |
| | **Case Material:** | Clean-up Methods: | Assume battery case material is contaminated and proceed as for **Plate Grids and Active Materials** above. |
| | **Separator Material:** | Clean-up Methods: | Assume *separator material is contaminated and proceed as for **Plate Grids and Active Materials** above. |

Note: If appropriate refer to Sections 8 and 13

## SECTION 7: HANDLING AND STORAGE

| 7 | Component: | | *Action |
|---|---|---|---|
| 7.1 | **VRLA Battery** | Precautions For Safe Handling: | Only trained operators should be allowed to handle VRLA batteries.<br>*CAUTION: Batteries are 'live' at all times: there is no "**ON**" / "**OFF**" switch |
| | | | PPE: No specialist protective clothing or equipment is required, except that for handling heavy weights. *It is good practice to wear safety footwear. |
| | | | Hygiene: There are no specialist requirements beyond good, standard workplace practices: *no smoking; no eating; wash hands before eating |
| | | | Mechanical lifting aides: (e.g. FLT and pallet trucks) will be required to move pallets of batteries. Weight approximately 1 tonne |
| | | | Mechanical handling aides: (e.g. trucks and lifters) will be required to handle individual batteries over 25 kg in weight. |
| | | | General Safety Considerations:<br>Do not drop batteries: dents and deformation of the case may be an indication of internal damage to the battery. Cracks will allow electrolyte to escape.<br>Do not place VRLA Batteries lid-to-lid so that terminals will short-circuit. |
| 7.2 | | Conditions For Safe Storage, Including Any Incompatibilities: | Store under a roof and protect against direct sunlight and adverse weather conditions including rain, snow and other sources of water. |
| | | | Storage of large quantities of VRLA batteries may require approval from local environmental protection agency and/or local water authorities. |
| | | | Pallets of VRLA Batteries are heavy. Store at ground level or in lower levels of storage systems (e.g. racking). |
| | | | Take special care in dry conditions to avoid the risk of electrostatic discharges. |
| | | | Protect against physical damage and exposure to organic solvents and other incompatible materials. |
| | | | Do not store VRLA batteries close to sources of heat, naked flames and sparks. |
| | | | Store batteries in their original packaging wherever possible. When batteries are removed from their original packaging (e.g. for transportation of small quantities), ensure new packaging protects the batteries from damage and the risk of short-circuit of the terminals. |
| | | | Ensure battery storage and top-charging areas are well ventilated.<br>***DO NOT PLACE VRLA INDUSTRIAL BATTERIES IN A GAS-TIGHT ENCLOSURE DURING STORAGE, TRANSPORT OR USAGE.** |
| | | | Ensure batteries are removed from equipment at the end of life and are collected for recycling by an approved contractor. |
| | | End-of-Life<br>(EC WEEE Regulations) | 1. Refer to EN 50272-1:2010, Safety requirements for secondary batteries and battery installations – Part 1 General safety information.<br>2. Refer to EN 50272-2:2001, Safety requirements for secondary batteries and battery installations – Part 2 Stationary batteries. |
| 7.3 | | Specific End Uses:<br>Installation: | |

## SECTION 8: EXPOSURE CONTROL / PERSONAL PROTECTION

| | **Components** | | |
|---|---|---|---|
| **8.1** | **VRLA Battery** | Control Parameters: | There are no special control parameters for the handling, storage, installation of VRLA Batteries.<br>VRLA Batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approximately 4% to 76%. Never install VLRA *industrial batteries in a gas-tight enclosure during storage, transport or usage. |
| **8.2** | | Exposure Control: | There are no special exposure controls for the handling, storage, installation or use of VRLA Batteries. |
| **8.3** | | Personal Protection: | When there is no evidence of damage or visible traces of liquid (electrolyte) or solid deposits on the batteries they may be handled safely without extra personal protective equipment.<br><br>Ensure electrical insulation equipment is used when installing batteries. (e.g. insulated mats and covers; insulated tools)<br><br>Remove ALL metallic objects from the person when working with VRLA Batteries: e.g. Jewellery (rings, watches, bracelets, necklaces), pens, torches, etc.<br><br>Where there are signs of damage or liquid (electrolyte) or solid deposits, acid resistant gloves and clothing must be worn when handling the batteries and *contaminated packaging to protect against the effects of any electrolyte that may be present.<br>If it is suspected that free electrolyte is present, then safety glasses must be worn, and if large amounts are present, chemical goggles or face shield should be used. |
| | | **UL CAUTIONARY STATEMENT:** | "Warning: Risk of fire, explosion, or burns. Do not disassemble; heat above 50°C; or incinerate". |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

| | **Components** | |
|---|---|---|
| **9.1** | **VRLA Battery** | • The main components are listed in **SECTION 2** above.<br>• The undamaged product is a manufactured article in an inert plastic (ABS) case, which will burn if subjected to high temperatures or sources of ignition. Some battery types are made with Flame Retardant ABS cases, see technical specification. These batteries usually carry the suffix 'FR' after the battery type; e.g. NP24-12IFR. Some battery types are not available in Flame Retardant ABS cases: these do not carry the suffix "FR". |

The information below refers to the physical and chemical properties of the main VRLA Battery components and substances. This information is published for reference only.

| | | | | |
|---|---|---|---|---|
| **Plate Grids and Active materials:** | Appearance | | Safety-related data | |
| | *Form* | Solid | *Solidification point* | 327 °C |
| | *Colour* | Grey or brown | *Boiling point* | 1740 °C |
| | *Odour* | Odourless | *Solubility in water* | Very low (0.15mg/l) |
| | | | *Solubility in acid or alkaline solutions* | Yes, dependant on the strength of solution. |
| | | | *Density (at 20°C)* | 11.35 g/cm$^3$ |
| | | | *Vapour pressure (at 20°C)* | Undetectable |
| **Battery Electrolyte:** | | | | |
| | *Form* | Liquid | *Solidification point* | -35 to -60 °C |
| | *Colour* | Colourless | *Boiling point* | Approx. 108 to 114 °C |
| | *Odour* | Odourless | *Solubility in water* | Complete |
| | | | *Density (at 20°C)* | Variable up to 1.350 g/cm$^3$ |
| | | | *Vapour pressure (at 20°C)* | 10-20 mmHg |
| **Case Material:** | Appearance | | Safety-related data | |
| | *Form* | Solid | *Softening point* | > 100 °C (DIN 53460) |
| | *Colour* | Grey or black | *Flash Point* | >330 °C |
| | *Odour* | Slight Odour | *Solubility in water* | Insoluble |
| | | | *Solubility in other solvents* | Soluble in polar solvents, aromatic solvents, chlorinated hydrocarbons. |
| | | | *Density (at 20°C)* | 1.07-1.4 g/cm$^3$ (DIN 53479) |
| | | | *Vapour pressure (at 20°C)* | Undetectable |
| **Separator Material:** | | | | |
| | *Form* | Fibrous material | *Solidification point* | 820°C |
| | *Colour* | White | *Boiling point* | >2500°C |
| | *Odour* | Odourless | *Solubility in water* | Insoluble |
| | | | *Density (at 20°C)* | 2.23g/cm$^3$ |
| | | | *Vapour pressure (at 20°C)* | Undetectable |

## SECTION 10: STABILITY AND REACTIVITY

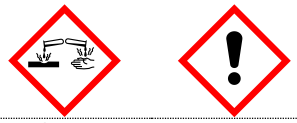
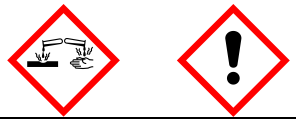
| | Components | | |
|---|---|---|---|
| **10.1** | **VRLA Battery** | Stability: | Within the operational temperature range -20 to +50 °C the undamaged product is stable. |
| **10.2** | **Plate Grids and Active materials:** | Materials & Conditions to Avoid: | Powdered Lead reacts violently with fused ammonium nitrate and sodium acetylide. Reacts violently when in contact with chlorine trifluoride |
| **10.3** | **Battery Electrolyte:** | Possibility of Hazardous Reactions | • Dilution of the higher concentrated grades with water may liberate excessive heat.<br>• Highly reactive with metals and organic materials.<br>• On contact with metal with air.<br>• Destroys organic materials such as cardboard, wood, textiles, etc.<br>• Vigorous reaction with sodium hydroxide and alkalis. |
| | | Hazardous Decomposition Product(s): | • Sulphur oxides |
| **10.4** | **Case Material:** | Materials & Conditions to Avoid: | • To avoid thermal decomposition, do not overheat.<br>• Starts to decompose at temperatures >275°C.<br>• Powerful oxidising agents. |
| | | Hazardous decomposition products: | • Monomers, other degradation products, traces of hydrogen cyanide. |
| **10.5** | **Separator Material:** | Stability: | • Stable material. |
| | | Materials & Conditions to Avoid: | • Incompatible with Hydrofluoric acid and concentrated Sodium Hydroxide. |
| | | Hazardous decomposition products: | • No hazardous polymerisation expected. |

## SECTION 11: TOXICOLOGICAL INFORMATION

This information is of relevance only if the VRLA Battery has suffered damage and is broken.

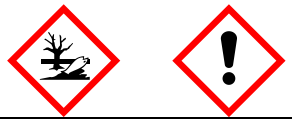
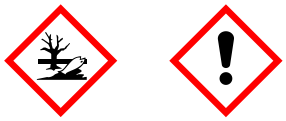
| | Components | | |
|---|---|---|---|
| **11** | **VRLA Battery** | | • This information does not apply to the undamaged VRLA Battery. It is of relevance if the battery is broken and the components are released to the environment.<br>• Exposure limits may vary according to national law and regulations. |
| **11.1** | **Plate Grids: Metallic Lead, Lead alloys.** | Toxicity<br> | • Toxic by ingestion or inhalation<br>• Chronic poison<br>• Lead is a poison that affects virtually every system in the body<br>• Symptoms include fatigue, headaches, constipation, aching bones and muscles, gastrointestinal tract disturbances and reduced appetite<br>• Blood Lead levels of 80 µg/dl and above have been associated with both acute and chronic effects of Lead poisoning |
| | **Active materials: Lead dioxide.** | Toxicity<br> | • Toxic by ingestion or inhalation<br>• Chronic poison<br>• Chronic exposure to Lead compounds may lead to a build-up of Lead in the body, giving rise to a variety of health problems, including anaemia, kidney and liver damage, impaired eyesight, memory loss and CNS[2] damage |
| | **Battery Electrolyte:** | Dilute Sulphuric Acid<br> | Corrosive, the more concentrated solutions can cause serious burns to the mouth, eyes and skin<br>Harmful by ingestion and through skin contact |
| | | Inhalation: | Mist is a severe irritant to the respiratory tract. Fluid build up on the lung (pulmonary oedema) may occur up to 48 hours after exposure and could prove fatal |
| | | Ingestion:<br> | Will immediately cause severe corrosion of and damage to the gastrointestinal tract. |

[2] CNS = Central Nervous System

| | | | |
|---|---|---|---|
| **11.1** | **Battery Electrolyte:** | Skin Contact:  | Causes severe chemical burns |
| | | Eye Contact:  | Risk of serious damage to eyes. Causes severe burns. May cause prolonged or permanent damage or even total loss of sight. Mist will cause irritation |
| | **Case Material:** | | According to information available the product is not harmful to health provided it is correctly handled and processed according to the given recommendations. |
| | **Separator Material:** | | Based on animal implantation and epidemiologic studies glass microfibers are thought to have some limited carcinogenic potential and as such are designated as Group 2B materials (IARC, US). The material should be treated as a category 3 carcinogen (Europe).<br>Limited evidence of carcinogenic effect. |

## SECTION 12: ECOLOGICAL INFORMATION

This information is of relevance only if the VRLA Battery has suffered damage and is broken.

| | **Components** | | |
|---|---|---|---|
| **12.1** | **VRLA Battery** | | This information does not apply to the undamaged VRLA Battery. It is of relevance if the battery is broken and the components are released to the environment. |
| **12.2** | **Plate Grids and Active materials:** | Metallic Lead, Lead alloys and Lead dioxide. | Chemical and physical treatment is required for the elimination of Lead from water. Waste water containing Lead must not be disposed of in an untreated condition. |
| | | Ecotoxicity: <br>Risk Phrase R52/53 | • The general classification for Lead compounds, R50/53 does not apply to Battery Lead Oxide<br>• Tests in 2001 and 2005 have concluded that Battery Lead Oxide is NOT toxic for the environment; neither R50 nor R50/53 nor R51/53.<br>• Risk Phrase R52/53 (Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment) applies to Battery Lead Oxide. |
| | | Effect in the aquatic environment:  | • Toxicity for fish: 96 h LC 50 > 100 mg/l<br>• Toxicity for daphnia: 48 h EC 50 > 100 mg/l<br>• Toxicity for alga: 72 h IC 50 > 10 mg/l |
| **12.3** | **Battery Electrolyte:** | Ecotoxicity:  | • In order to avoid damage to the sewerage system, the acid has to be neutralised by means of soda ash, sodium bicarbonate or sodium carbonate before disposal.<br>• Ecological damage is possible by change of pH. The electrolyte solution reacts with water and organic substances, causing damage to flora and fauna.<br>• The electrolyte may also contain components of Lead that can be toxic to aquatic environments. |
| | | Persistence and Degradation: | Remains indefinitely in the environment as sulphate. |
| **12.4** | **Case Material:** | Elimination information: | No data available: insoluble in water |
| | | Behaviour and environmental fate: | Due to the consistency of the product, and its insolubility in water, it will apparently not be bio-available. |
| **12.5** | **Separator Material:** | | No data available: insoluble in water<br>Not thought to pose any risk to the environment. |

## SECTION 13: DISPOSAL CONSIDERATIONS

| | Components | | |
|---|---|---|---|
| **13.1** | **VRLA Battery** | Europe: | • Spent (used) VRLA Batteries are subject to the requirements of the Batteries Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators. Spent (used) VRLA Batteries MUST be sent for recycling through an authorised contractor at the end-of-life.<br>• The WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment) applies. Spent (used) VRLA Batteries MUST be removed from electrical and electronic equipment at the end-of-life. |
| | | Worldwide: | • VRLA batteries contain inorganic Lead compounds and Sulphuric Acid which are damaging to the environment.<br>• Spent (used) batteries must be disposed of in an environmentally friendly manner in accordance with local national laws and regulations. |
| | | | • VRLA batteries must not be dismantled, burnt or incinerated as a means of disposal.<br>• At the end of life VRLA batteries may still be electrically 'live' and contain a large amount of electrical energy. The same care and attention to safe handling should be taken as when handling new batteries. Particular care must be taken to avoid short-circuiting the battery terminals. |
| **13.2** | **Plate Grids and Active materials:** | Europe<br>Worldwide | • Metallic Lead and active materials (Lead Oxides) must be recycled.<br>• Disposal must be carried out in accordance with the European Hazardous Waste Directive 2008/98/EC |
| **13.3** | **Battery Electrolyte:** | Europe | • Disposal must be carried out in accordance with the European Hazardous Waste Directive 2008/98/EC on the protection of the environment through criminal law |
| | | Worldwide | • Disposal should be in accordance with local, state or national legislation. |
| | | General | • Battery electrolyte is dilute Sulphuric Acid, the strength of which depends on the state of charge of the batteries. It must be neutralised before disposal. See SECTION 6 for clean-up and disposal advice. |
| **13.3** | **Case Material:** | | • Do not dispose of this product into sewers, any ocean or water course in order to prevent marine animals and birds from ingesting.<br>• Recycling is encouraged.<br>• Disposal by controlled incineration or source landfill in accordance with local national laws and regulations may be acceptable. |
| **13.4** | **Separator Material:** | | • Constitutes a special waste by virtue of hazardous substance content.<br>• Dispose of via approved landfill site. Disposal by controlled source landfill in accordance with local national laws and regulations may be acceptable. |

## SECTION 14: TRANSPORT INFORMATION

| | Components | | |
|---|---|---|---|
| **14.1** | **VRLA Battery** | Land Transport | Land Transport (ADR / RID)<br>• UN Nº: UN2800<br>• Classification ADR / RID: Class 8<br>• Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE electric storage<br>• Packing Group ADR: not assigned<br>• Tunnel code: E<br>• ADR / RID: New and spent (used) batteries are exempt from all ADR / RID (special provision 598) |
| | | Sea Transport | Sea transport (IMDG Code)<br>• UN Nº: UN2800<br>• Classification: Class 8<br>• Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE electric storage<br>• EmS: F-A, S-B<br>Non-Spillable batteries meet the requirements of Special Provision 238; they are exempt from all IMDG codes and are not subject to special regulation for sea transport |
| | | Air Transport | Air Transport (IATA-DGR)<br>• UN Nº: 2800<br>• Classification: Class 8<br>• Proper Shipping Name: BATTERIES, WET, NON-SPILLABLE electric storage<br>• Special Provision A48: Packaging test are not considered necessary<br>• Special Provision A67: Yuasa's VRLA batteries meet the requirements of Packing Instruction 872.<br>The battery has been prepared for transport so as to prevent: |

| | | | |
|---|---|---|---|
| | | | a) A short-circuit of the battery's terminals by packaging in a strong and sturdy carton box; AND/OR<br>b) The battery has been fitted with an insulating cover (made from ABS) which prevents contact with the terminals.<br>c) Unintentional activation is thus prevented<br>The words "NOT RESTRICTED" and the Special Provision (SP) number must be indicated on all shipping documents<br>• Special Provision: A164: The battery has been prepared for transport so as to prevent:<br>a) Short-circuit of the battery's terminals by packaging in a strong and sturdy carton box; AND/OR<br>b) The battery has been fitted with a cover (made from ABS) which prevents contact with the terminals<br>c) Unintentional activation is thus prevented |
| | | All methods of transport | **DO NOT PLACE VRLA BATTERIES INSIDE SEALED OR GAS-TIGHT ENCLOSURES.**<br>VRLA Batteries emit hydrogen gas which is highly flammable and will form explosive mixtures in air from approximately 4% to 76%. This can be ignited by a spark at any voltage, naked flames or other sources of ignition. |

## SECTION 15: REGULATORY INFORMATION

| | **Components** | | |
|---|---|---|---|
| **15.1** | **VRLA Battery** | Required Markings: | |
| | | | Crossed-out wheeled bin indicating "**SEPARATE COLLECTION**" for all batteries and accumulators. Not to be disposed of with general domestic, commercial or industrial waste.<br>Ref: The Batteries Directive 2006/66/EC |
| | | **Pb** | The **Pb** symbol indicates the heavy metal content of the battery and enables the Lead-Acid battery to be sorted for recycling.<br>Ref: The Batteries Directive 2006/66/EC. |
| | | | The International Recycling Symbol, required by law in many countries world-wide to facilitate the identification of secondary batteries and accumulators for recycling.<br>Ref: IEC 61429 : 1995, Marking of secondary cells and batteries with the International Recycling Symbol ISO 7000-1135. |
| | | EC Directives | Directive 2006/66/EC, on batteries and accumulators and waste batteries and accumulators<br>Paragraph (Recital) 29 states:<br>"Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment does not apply to batteries and accumulators used in electrical and electronic equipment." |

## SECTION 16: OTHER INFORMATION

| | **Components** | |
|---|---|---|
| **16 (a)** | **Revision Information** | Version 8: 14.05.2015<br>Changes from the text of the previous issue, (issue 7, dated 02.02.2015), are preceded with an asterisk (*). Pictograms are changed in accordance with the Globally Harmonized System (GHS) for the Classification, Labelling, and Packaging of Chemicals Regulation (EC) No.1272/2008.<br><br>Texts deleted from the previous issue are:<br>• Section 4, 'FOR ACCUTE EXPOSURE'.<br>• Section 8.3, 'acid-resistant' and 'contaminated'. |
| **16 (b)** | **Abbreviations** | **Pb** – the chemical symbol for Lead<br>**Ba** – the chemical symbol for Barium<br>**Ca** – the chemical symbol for Calcium<br>**Sn** – the chemical symbol for Tin<br>**$PbO_2$** – the chemical formulae for Lead Dioxide<br>**$H_2SO_4$** – the chemical formulae for Sulphuric Acid<br>**VRLA** – **V**alve **R**egulated **L**ead-**A**cid battery |

| | | |
|---|---|---|
| **16 (c)** | **Key literature references and sources of data** | SDS documents from suppliers for components and raw materials |
| **16 (d)** | **CLP Regulations** | Not Applicable |
| **16 (e)** | ***Hazard Statements (H-Statements)** | ***Hazard Statements (H-Statements)** are part of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Hazard statements provide standardized wording to indicate the hazards of a product including, when appropriate, the degree of the hazard.<br>In the European Union, H-statements will replace Risk phrases (R-phrases), as the GHS is phased in per Regulation (EC) No 1272/2008 (6.6 MB PDF file). |

| H-No. | R-No. | **Hazard Statements (H-Statements)** |
|---|---|---|
| H312 | R21 | Harmful in contact with skin |
| H302 | R22 | Harmful if swallowed |
| H331 | R23 | Toxic by inhalation |
| H311 | R24 | Toxic in contact with skin |
| H307 | R25 | Toxic if swallowed |
| H314 | R35 | Causes severe burns |
| H319 | R36 | Irritating to eyes |
| H335 | R37 | Irritating to respiratory system |
| H315 | R38 | Irritating to skin |
| H351 | R40 | Suspected of causing cancer |
| H332 | R49 | May cause cancer by inhalation |
| H402 | R52 | Harmful to aquatic organisms |
| H412<br>H413 | R53 | May cause long-term adverse effects in the aquatic environment |

| | | |
|---|---|---|
| **16 (f)** | **Training Advice** | • Only trained, competent personnel, who have received special instructions for the hazards and risks, should be allowed to handle VRLA Batteries.<br>• See Section 7.1 for general advice |
| **16 (g)** | **Further Information** | To ensure the safe use of VRLA Industrial Batteries supplied by **YUASA**, the following precautions must be observed:<br><br>• Never short-circuit battery terminals, since sparks and arcs produced can injure personnel and are a fire and explosion hazard.<br><br>• Batteries must always be charged on a voltage-regulated charging system with adequate ventilation provided to avoid the build-up of ignitable gases and to promote good heat dissipation.<br><br>• Do not charge VLRA Batteries above + 50 ºC, discharge or store above + 60 ºC.<br><br>• Under extreme conditions of charging equipment malfunction and/or battery failure, high voltage and high temperature conditions may occur causing the evolution of Hydrogen Sulphide ($H_2S$) gas, which is toxic. If detected by its odour of rotten eggs (at extremely low concentrations), switch off the charging equipment, evacuate all personnel from the area and ventilate well. Seek advice before attempting to re-start charging. |