| | | | | | |
|---|---|---|---|---|---|
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**OPENING STATMENT**

According to REACH regulation (EC1907/2006, Article 31) these batteries are considered to be ARTICLES with no intended release.

RoHS- Directive 2011/65/EU refers batteries to 2006/66EC and in turn to 2002/95/EC. The 2002/95/EC directive does not apply to batteries used in electrical and electronic equipment.

Once batteries are removed from 'end of life' electrical and electronic equipment batteries should comply again with the Battery directive 2011/65/EU as waste batteries. It is a requirement under this directive that all batteries should be recycled at end-of-life.

## SECTION 1. – SUPPLIERS INFORMATION

GS Yuasa Battery Sales UK Ltd.
Unit 13, Hunts Rise,
South Marston Park,
Swindon.
Wiltshire.
SN3 4TG
Telephone number for information: +44 (0)1793 833555
Website: www.yuasa.co.uk
Email: info@gs-yuasa.uk

## SECTION 2. – HAZARD DESCRIPTION

| | |
|---|---|
| **1.** | For the battery, chemical materials are stored in a hermetically sealed case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger. However, do not open, short-circuit, squeeze, burn, disassemble, expose to flame, mix different models, different chemical properties, or different types of batteries. The battery case will be breached at the extreme, hazardous materials may be released. |
| **2.** | Hazard class and label elements of the product according to UN GHS (the 8th revised edition): |

**GHS/GHS Hazard class**

| | |
|---|---|
| **Acute toxicity-oral** | Category 4 |
| **Acute toxicity-inhalation** | Category 4 |
| **Skin sensitization** | Category 1 |
| **Skin Corrosion/Irritation** | Category 1 |
| **Serious Eye Damage/ Irritation** | Category 1 |
| **Carcinogenicity** | Category 2 |
| **Reproductive toxicity** | Category 1B |

| | | | | | |
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**GHS/GHS Label elements**

| | |
|---|---|
| **Pictogram (s):** |  |
| **Signal word:** | **Danger** |

**Hazard Statements**

| | |
|---|---|
| **H302:** | Harmful if swallowed. |
| **H314:** | Causes severe skin burns and eye damage. |
| **H317:** | May cause an allergic skin reaction. |
| **H318:** | Causes serious eye damage. |
| **H332:** | Harmful if inhaled. |
| **H351:** | Suspected of causing cancer. |
| **H360:** | May damage fertility or the unborn child |

**Precautionary statements**

**Prevention**

| | |
|---|---|
| **P280:** | Wear protective gloves/ protective clothing/ eye protection/ face protection. |

**Response**

| | |
|---|---|
| **P310:** | Immediately call a POISON CENTER or doctor/physician. |
| **P312:** | Call a POISON CENTER or doctor/physician if you feel unwell. |
| **P330:** | Rinse mouth. |
| **P363:** | Wash contaminated clothing before reuse. |
| **P301+P312:** | **IF SWALLOWED:Call 999 immediately if in the UK. If outside of the UK, contact your emergency services or relative poison centre or helpline** |
| **P301+P352:** | IF ON SKIN: Wash with plenty of soap and water. |
| **P304+P340:** | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| **P308+P313:** | IF exposed or concerned: Get medical advice/attention |
| **P333+P313:** | If skin irritation or rash occurs: Get medical advice/attention. |
| **P362+P364:** | Take off contaminated clothing and wash before reuse. |
| **P301+P330+P331:** | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |

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| | |
|---|---|
| **P303+P361+P353** | IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower. |
| **P305+P351+P338:** | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |

**Storage**

| | |
|---|---|
| **P405:** | Store locked up. |

**Disposal**

| | |
|---|---|
| **P501:** | Dispose of contents/container in accordance with local/ regional/ national/ international guidelines. |

**Physical and chemical hazards**

| | |
|---|---|
| | Non-flammable, no special explosive characteristics. |

**Health hazards**

| | |
|---|---|
| **Inhalation:** | Harmful if inhaled. |
| **Ingestion:** | Harmful if swallowed. Suspected of causing cancer. May damage fertility or the unborn child. |
| **Skin contact:** | May cause an allergic skin reaction. Causes severe skin burns |
| **Eye contact:** | Redness, pain, burning. |

**Environmental hazards**

| | |
|---|---|
| | Please refer to Section 12 of MSDS. |

## SECTION 3. – COMPOSITION/ INGREDIENT DATA

| **INGREDIENTS INFORMATION** | | |
|---|---|---|
| **Ingredient's name** | **Content % W. t.** | **CAS No.** |
| Manganese dioxide | 46.0 | 1313-13-9 |
| Iron | 25.0-30.0 | 7439-89-6 |
| Propylene carbonate | 7.0 | 108-32-7 |
| Poly (tetrafluoroethylene) | 5.0 | 9002-84-0 |
| 1,2-Dimethoxyethane | 5.0 | 110-71-4 |
| Lithium | 3.8 | 7439-93-2 |
| Polypropylene | 3.0 | 9003-07-0 |

| | | |
|---|---|---|
| Graphite | 2.0-3.0 | 7782-42-5 |
| Aluminium | 2.0 | 7429-90-5 |
| Lithium perchlorate | 1.0-1.5 | 7791-03-9 |
| Nickel | 1.0 | 7440-02-0 |

## SECTION 4. – FIRST AID MEASURES

| **1.** | **First aid (Apply if material leakage from the battery occurs):** |
|---|---|
| **General advice:** | Show this Material safety data sheet to the doctor in attendance.<br>After receiving the first-aid measure required, consult a physician if necessary. |
| **Skin contact:** | Remove contaminated clothing and shoes.<br>Wash off with mild soap and plenty of water.<br>If skin irritation occurs or persists, consult a physician immediately. |
| **Eye contact:** | Check for and remove any contact lenses, occasionally lifting the upper and lower eyelids.<br>**Immediately** irrigate with eyewash solution or clean water for at least 10 minutes, holding the eyelids apart.<br>Do not rub eyes.<br>If eye irritation occurs or persists, consult a physician immediately. |
| **Inhalation:** | Remove victim to fresh air and keep at rest in a position comfortable for breathing.<br>If breathing is irregular, provide artificial respiration or oxygen by trained personnel.<br>Get medical attention if adverse health effects persist or are severe. |
| **Ingestion:** | **SPEED IS ESSENTIAL - OBTAIN IMMEDIATE MEDICAL ATTENTION**<br>**If swallowed, call 999 immediately.** If outside of the UK, contact your emergency services or corresponding poison centre/ helpline.<br>Batteries lodged in the oesophagus should be removed immediately since leakage, caustic burns and perforation can occur as soon as two hours after ingestion. Irritation to the internal/external mouth areas may occur following exposure to a leaking battery. Published reports recommend removal from the oesophagus should be done endoscopically (under direct visualization). Batteries beyond the oesophagus need not be retrieved unless there are signs of injury to the GI tract, or a large diameter battery fails to pass the pylorus. If asymptomatic, follow-up x-rays are necessary only to confirm the passage of larger batteries. Confirmation by stool inspection is preferable under most circumstances. |

**Most important acute and delayed symptoms/effects**

| | |
|---|---|
| **1.** | The most important known symptoms and effects are described in section 2 and/or in section 11. |

| | | | | | |
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**Immediate/special treatment**

| | |
|---|---|
| **1.** | Continue with first aid measures. Treat symptomatically and supportively |
| **2.** | Symptoms may be delayed. |

## SECTION 5. – FIREFIGHTING MEASURES

**Extinguishing agent**

| | |
|---|---|
| **1.** | In case of fire, water flooded ground fire. If the battery is burning, water or $CO_2$ (carbon dioxide) can be used to cool the area and control the speed of the fire. |
| **2.** | If fire progresses to where lithium metal is exposed (deep red flames), use a Class D extinguisher suitable for lithium metal. |
| **3.** | Large quantities of batteries involved in a fire will rupture and release irritating fumes from thermal degradation Use a Class "D" fire extinguisher or other smothering agent such as Lith-X, copper powder or dry sand. If using water, use enough to smother the fire. Using an insufficient amount of water will make the fire worse. Cooling exterior of batteries will help prevent rupturing. Burning batteries generate toxic and corrosive lithium hydroxide fumes. Firefighters should wear self-contained breathing apparatus. |

## SECTION 6. – ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment (PPE) and emergency procedures**

| | |
|---|---|
| **1.** | No action shall be taken involving any personal risk or without suitable training. |
| **2.** | Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. |
| **3.** | Do not touch or walk-through areas where materials have split, avoid slipping. |
| **4.** | Avoid breathing dusts. |
| **5.** | Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. |
| **6.** | Put on appropriate PPE (see section 8) |

**Environmental precautions**

| | |
|---|---|
| **1.** | Prevent further leakage or spillage if safe to do. |
| **2.** | Discharge into the environment must be avoided. |

**Methods and materials for containment and cleaning up**

| | |
|---|---|
| **1.** | Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water then mop up if water-soluble. Alternatively, or if water insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. |

| | |
|---|---|
| **2.** | Large spill: Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth. |
| **3.** | Contaminated absorbent material may pose the same hazard as the spilt product. |
| **4.** | Waste materials should be promptly disposed of, in accordance with appropriate laws and regulations. |

## SECTION 7. – HANDLING AND STORAGE

### Precautions for safe handling

| | |
|---|---|
| **1.** | Do not reverse the (+) and negative (-) terminals when used. |
| **2.** | Do not connect the battery to an electrical outlet. |
| **3.** | Do not use or leave the battery near a heat source, such as a fire or heater |
| **4.** | Do not immerse the battery in water or sea water and place the battery in a cool and dry environment. |
| **5.** | If the battery gives off an odour, generates heat, becomes discoloured or deformed, or in any way appears abnormal during use or storage, immediately remove it from the device and stop using. |
| **6.** | Do not expose the battery to excessive vibration. Avoid short circuit, however accidental short circuit for a short period of time will not have a serious impact on the battery. |
| **7.** | Long-term short circuit can reduce the performance of the battery in the energy/ capacity it can provide. It can cause the battery to heat up (creating a risk of burning) and in the extreme, could explode. |
| **8.** | Poor storage or contact with metal accessories, such as coins etc. placement on metal surfaces, such as workbenches, tin foil, metal belts etc. can cause a short-circuit. |
| **9.** | Measures should be in place for the correct storage and transportation of the battery to avoid short-circuit. |
| **10.** | Keep away from heat, sparks, open flames and hot surfaces. |

### Precautions for storage

| | |
|---|---|
| **1.** | Store in accordance with local regulations. Store in a dry, cool and well-ventilated area. Keep container tightly closed. |
| **2.** | Keep away from heat, sparks, open flames and hot surfaces. |
| **3.** | Keep away from incompatible materials (see section 10). |
| **4.** | Keep out of the reach of children and pets. |

| | | | | | |
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## SECTION 8. – EXPOSURE CONTROLS/ PERSONAL PROTECTION

### CONTROL PARAMETERS - Occupational exposure limit values

| CAS No. | Country/ region | Occupational exposure limits (8h) | | Occupational exposure limits (Short time) | |
|---|---|---|---|---|---|
| | | ppm | mg/m³ | ppm | mg/m³ |
| 1313-13-9 | Latvia | | 0.3 | | |
| 108-32-7 | Latvia | | 2 | | |
| 110-71-4 | Latvia | | 10 | | |
| | Canada | 5 | 18 | | |
| 7439-93-2 | Switzerland | | 0.2 | | 0.2 |
| | Sweden | | | | 0.02 |
| | Germany | | 0.2 | | 0.2 |
| 7782-42-5 | USA | | 15 | | |
| | Korea | | 2 | | |
| | Ireland | | 10 | | |
| | Germany | | 4 | | |
| | Denmark | | 2.5 | | 5 |
| | Australia | | 3 (4) | | |
| 7429-90-5 | USA | | 15 | | |
| | Korea | | 10 | | |
| | Ireland | | 1 | | |
| | Germany | | 4 | | |
| | Denmark | | 5 | | 10 |
| | Australia | | 10 | | |
| 7440-02-0 | USA | | 1 | | |
| | Korea | | 1 | | |
| | Ireland | | 0.5 | | |
| | Hungary | | 0.1 | | 0.1 |
| | Denmark | | 0.05 | | 0.1 |
| | Australia | | 1 | | |

### Engineering controls

| | |
|---|---|
| **1.** | Ensure adequate ventilation, especially in confined areas. |
| **2.** | Ensure that eyewash stations and safety showers are close to the workstation location. |

| | | | | | |
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**Personal protection**

| | |
|---|---|
| **General requirements:** |  |
| **Respiratory protection:** | Respiratory protective equipment is not necessary if used as intended. Respiratory protection may be required under exceptional circumstances when excessive air contamination exists. If the batteries leak, then it is recommended to provide ventilation and air circulation to the area. Avoid operating in a narrow place. |
| **Eye protection:** | Not necessary if used as intended, wear goggles/safety glasses giving complete eye protection if the battery is damaged or leaking. |
| **Skin and body protection:** | Not necessary if used as intended, wear appropriate clothing and boots to minimize skin exposure if the battery is damaged or leaking. |
| **Hand's protection:** | Not necessary if used as intended, wear appropriate protective gloves if the battery is damaged or leaking.<br>Check protective gloves prior to each use for their proper condition. |

## SECTION 9. – PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance and character:** | Battery state under normal temp: solid, cylinder |
| **Odour:** | Odourless |
| **Melting point/ freezing point (°C):** | No data |
| **Initial boiling point and boiling range (°C):** | No data |
| **Flash point (°C):** | Not applicable |
| **Evaporation rate:** | No data |
| **Steam pressure (20°C):** | No data |
| **Relative density (water=1)** | No data |
| **Partition coefficient n-octanol/water:** | No data |
| **Decomposition temperature (°C):** | No data |
| **Auto ignition temperature (°C):** | No data |
| **pH value:** | Not applicable |
| **Explosion limit [% (v/v)]:** | Non-explosive |
| **Relative vapour density (air=1):** | No data |

| | | | | | |
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| | |
|---|---|
| **Solubility:** | Insoluble in water |
| **Flammability (solid, gas):** | Non-flammable |
| **Oxidizing properties:** | The substance does not belong to oxidizing substances |

## SECTION 10. – STABILITY AND REACTIVITY

| | |
|---|---|
| **Stability:** | The product is chemically stable. |
| **Reactivity:** | Stable under recommended storage and handling conditions. |
| **Incompatible materials:** | Strong oxidizing agents. |
| **Conditions to avoid:** | In contrast to the nature of the material, overheating, exposed to damp air or water, mechanical vibration and power abuse. |
| **Hazardous decomposition products:** | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |

## SECTION 11. – TOXICOLOGICAL INFORMATION

| Component(s) | CAS No. | $LD_{50}$ (Oral) | $LD_{50}$ (Dermal) | $LC_{50}$ (Inhalation) |
|---|---|---|---|---|
| Manganese dioxide | 1313-13-9 | Rat: >3478mg/kg | No data | No data |
| 1,2-Dimethoxyethane | 110-71-4 | Rat: 1000mg/kg Mouse: 3200mg/kg | No data | No data |
| Iron | 7439-89-6 | Rat: 30000mg/kg | No data | No data |

| | |
|---|---|
| **Skin corrosion/ irritation:** | Lithium: causes severe skin burns (Category 1B). |
| **Eye corrosion/ irritation:** | Lithium: causes serious eye damage (Category 1). |
| **Respiratory sensitization:** | These products are not known to cause human respiratory sensitization. |
| **Skin sensitization:** | Nickel: May cause an allergic skin reaction (Category 1). |
| **Germ cell mutagenicity** | According to the existing data, the product is not classified. |
| **Carcinogenicity:** | Nickel: Suspected of causing cancer (Category 2). |
| **Reproductive toxicity:** | 1,2- Dimethoxyethane: May damage fertility or the unborn child (category 1B). |
| **Specific target organ toxicity – single exposure:** | According to the existing data, the product is not classified. |
| **Specific target organ toxicity – repeated:** | According to the existing data, the product is not classified. |
| **Asphyxiation hazard:** | According to the existing data, the product is not classified. |

| | | | | | |
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## SECTION 12. – ECOLOGICAL INFORMATION

**Aquatic toxicity**

| | |
|---|---|
| **Acute/chronic aquatic toxicity:** | According to existing data, the product is not classified. |

**Persistence and degradability**

| | |
|---|---|
| **Degradability:** | No data |

**Bio-accumulative potential**

| | |
|---|---|
| **Bioaccumulation:** | No data |

**Mobility in soil**

| | |
|---|---|
| **Mobility:** | No data |

**Other adverse effects**

| | |
|---|---|
| **1.** | May slightly be harmful to water, do not allow material to be released to the environment without proper governmental permits. |

## SECTION 13. – DISPOSAL CONSIDERATION

**Waste disposal**

| | |
|---|---|
| **Residual waste:** | Before disposal, users should refer to the relevant national and local laws and regulation. The generation of waste should be avoided or minimized wherever possible. Recommended transfer to a suitable container and arrange for collection by specialized recycling/disposal company. |
| **Contaminated packaging:** | The generation of waste should be avoided or minimized wherever possible. Waste packaging should be transferred to a suitable container and arrange for collection by a specialized recycling/ disposal company. |
| **Disposal considerations:** | Dispose of container and unused contents in accordance with national and local relevant laws and regulation. |

## SECTION 14. – TRANSPORT INFORMATION

| | |
|---|---|
| **UN NO.:** | UN3090 |
| **UN Transport name:** | Lithium metal batteries (including lithium alloy batteries) |
| **Hazard class(es):** | 9 |
| **Packaging group:** | N/A |

| | | | | | |
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| | |
|---|---|
| **ICAO/IATA** | Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing instruction section 1B of 968 of appropriate IATA DGR 62ND (2021 Edition) for transportation. |
| **Marine/Water Transport IMDG CODE:** | The batteries are not restricted to IMDG Code 2018 Edition (Amdt 39-18) according to special provision 188. |
| **ADR/AND:** | The batteries are not subject to the provisions of the United Nations Economic Commission for Europe (UNECE) ADR/ADN if they meet the requirements of special provision 188 of Chapter 3.3 Applicable as from 1st January 2019. |

| | |
|---|---|
| **1.** | In addition, to be permitted in transport each lithium cell and battery types must have passed the applicable tests set out in Subsection 38.3 of the UN Manual of Test and Criteria. |
| **2.** | Separate batteries to prevent short-circuiting. Batteries should be packed in secure packaging for transport. Lithium cell or battery should be packaged with a safety venting device to prevent a violent rupture under normal transport conditions. Keep away from high temperature and open flames. |

## SECTION 15. – REGULATORY INFORMATION

**Safety, health and environmental regulations/legislation specific for the substance or mixture:**

| | |
|---|---|
| **1.** | Regulatory information: Reference to the local, national, US,EU,CA and international regulations. |

| CAS No. | TSCA | EINECS | DSL | IECSC | NZIoC | PICCS | KECI | AICS |
|---|---|---|---|---|---|---|---|---|
| 1313-13-9 | √ | √ | √ | √ | √ | √ | √ | √ |
| 7439-89-6 | √ | √ | √ | √ | √ | √ | √ | √ |
| 108-32-7 | √ | √ | √ | √ | √ | √ | √ | √ |
| 9002-84-0 | √ | √ | √ | √ | √ | √ | √ | √ |
| 110-71-4 | √ | √ | √ | √ | √ | √ | √ | √ |
| 7439-93-2 | √ | √ | √ | √ | √ | √ | √ | √ |
| 9003-07-0 | √ | √ | √ | √ | √ | √ | √ | √ |
| 7782-42-5 | √ | √ | √ | √ | √ | √ | √ | √ |
| 7429-90-5 | √ | √ | √ | √ | √ | √ | √ | √ |
| 7791-03-9 | √ | √ | √ | √ | √ | × | × | √ |
| 7440-02-0 | √ | √ | √ | √ | √ | √ | √ | √ |

| | | | | | |
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| | |
|---|---|
| **TSCA:** | United States Toxic Substances Control Act Inventory |
| **EINECS:** | European Inventory of Existing Commercial Chemical Substances |
| **DSL:** | Canadian Domestic Substances List |
| **IECSC:** | China Inventory of Existing Chemical Substances |
| **PICCS:** | Philippines Inventory of Chemicals and Chemical Substances |
| **NZIoC:** | New Zealand Inventory of Chemicals |
| **KECI:** | Existing and Evaluated Chemical Substances |
| **AICS** | List of existing chemical substances in Australia |
| **Note:** | "✓" Indicates that the substance included in the regulations<br>"×" That no data exists relative to corresponding regulations |

## SECTION 16. – OTHER INFORMATION

**Abbreviations or phrases**

| | |
|---|---|
| **ACGIH:** | American Conference of Governmental Industrial Hygienists |
| **ADR:** | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| **CAS:** | Chemical Abstracts Service |
| **CLP:** | Classification, labelling and packaging |
| **EC:** | Council of Europe |
| **ECHA:** | European Chemicals Agency |
| **EINECS:** | European Inventory of Existing commercial Chemical Substances |
| **GHS:** | Globally Harmonized System of Classification and Labelling of Chemicals |
| **IARC:** | International Agency for Research on Cancer |
| **IATA** | International Air Transport Association |
| **RID:** | Regulation for rail International transportation of Dangerous goods |
| **ICAO:** | International Civil Aviation Organization |
| **IMDG:** | International Maritime Dangerous Goods Code |
| **$IC_{50}$:** | Inhibitory Concern Triton 50% |
| **$LC_{50}$:** | Lethal Concentration 50% |
| **$LD_{50}$:** | Median Lethal Dose 50% |
| **MAPROL:** | International Convention for the Prevention of Pollution from Ships |

| | | | | | |
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| | |
|---|---|
| **REACH:** | REGULATION concerning the Registration, Evaluation, Authorization and Restriction of Chemicals |
| **STEL:** | Short Term Exposure Limit |
| **TWA:** | Time Weighted Average |
| **MAC:** | Maximum Allowable Concentration |
| **OSHA:** | Occupational Safety and Health Administration |
| **NIOSH** | National Institute for Occupational Safety and Health |
| **TLV** | Threshold Limit Value |
| **TLV-TWA** | Threshold Limit Value- Time Weighted Average |
| **TLV-STEL** | Threshold Limit Value - Short Term Exposure Limit |
| **PC-TWA** | Permissible Concentration - Time Weighted Average |
| **PC-STEL** | Permissible Concentration - Short Term Exposure Limit |
| **PEL** | Permissible Exposure Limit |
| **OELS:** | Occupational Exposure Limits |

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

END

**YBSUK reference document (s):**
N50.160.602.001.HLE-6
N50.160.602.003.HLE-5