

**[Material Safety Data Sheet] - Lead Acid Battery Wet, Filled with Acid****SECTION1 - CHEMICAL AND COMPANY IDENTIFICATION**

**Manufacturer's Name :** HYUNDAI SUNGWOOLITE

183-12 Yongmyeonggongdan-gil, Geoncheon-eup,  
Gyeongju-si, Gyeongbuk, Korea

**Date :** 3rd, Jan, 2020

**Trade Name :** CMF Battery

Telephone Number for Information : 82-54-750-7155

**Classification :** Battery wet, filled with acid, electric storage

**SECTION2 - HAZARD IDENTIFICATION****1. Classification of the substance or mixture (GHS)**

Substances and mixtures, which in contact with water, emit flammable gases, categories 2

Acute toxicity (oral, dermal, inhalation) categories 1

Skin corrosion categories 1

Serious eye damage category 1

Carcinogenicity categories 1A

Germ cell mutagenicity categories 2

Reproductive toxicity categories 1A

Specific Target Organ Toxicity - Single exposure categories 1

Specific Target Organ Toxicity - Repeated exposure categories 1

**2. GHS Label elements****1) Pictogram****2) GHS Signal word : Danger****3) GHS Hazard statements**

H261 In contact with water releases flammable gas

H314 Cause severe skin burns and eye damage

H318 Causes serious eye damage

H330 Fatal if inhaled

H341 Suspected of causing genetic defects

H350 May cause cancer

H360 May damage fertility or the unborn child

H370 Causes damage to organs

H372 Causes damage to organs through prolonged or repeated exposure

#### **4) GHS Precautionary statements**

P201 Obtain special instructions before use  
P202 Do not handle until all safety precautions have been read and understood  
P223 Do not allow contact with water  
P231 + P232 Handle under inert gas. Protect from moisture.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray  
P264 Wash thoroughly after handling  
P270 Do not eat, drink or smoke when using this product  
P271 Use only outdoors or in a well-ventilated area  
P280 Wear protective gloves/protective clothing/eye protection/face protection  
P281 Wear protective gloves/protective clothing/eye protection/face protection  
P284 [In case of inadequate ventilation] wear respiratory protection

#### **5) GHS First aid measure**

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 : IF INHALED : Remove person to fresh air and keep comfortable for breathing  
P305 + P351 + P338 IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P307 + P311 Immediately call a POISON CENTER/doctor/?  
P308 + P313 IF exposed or concerned : Get medical advice/attention.  
P310 Immediately call a POISON CENTER/doctor/  
P314 Get medical advice/attention if you feel unwell.  
P320 Specific treatment is urgent (see on this label).  
P321 Specific treatment (see on this label).  
P335 + P334 Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.  
P363 Wash contaminated clothing before reuse.  
P370 + P378 In case of fire : Use to extinguish.

#### **6) GHS Storage**

P402 + P404 Store in a dry place. Store in a closed container.  
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
P405 Store locked up.

#### **7) GHS Disposal**

P501 Dispose of contents/container to in accordance with local/regional/national/international regulations (to be specified).

#### **8) Other hazards which do not result in classification (NFPA)**

##### SULFURIC ACID

Health 3  
Flammability 0  
Reactivity 2

##### LEAD

Health 1  
Flammability 0  
Reactivity 0

POLYPROPYLENE

Health 1

Flammability 1

Reactivity 0

POLYETHYLENE

Health 1

Flammability 1

Reactivity 0

**SECTION3 - COMPOSITION/INFORMATION ON INGREDIENTS**

Hazardous Components Specific Chemical Identity (Common Name(s))	OSHA PEL	ACGIH TLV	Range Percent By Weight	Average	*SVHC? (REACH)
Lead, CAS #7439921	0.05 mg/m3	0.05 mg/m3	50 ~ 65	58	No
Sulfuric Acid, CAS #7664939	1.0 mg/m3	1.0 mg/m3	27 ~ 41	34	No
Polypropylene, CAS #9003070	-	-	5 ~ 11	8	No
Polyethylene, CAS #9002884	-	-	1 ~ 2	1	No

\* SVHC : Substances of Very High Concern (REACH Regulation in EU)

**SECTION4 - FIRST AID MEASURES**

**Emergency and First Aid Procedures :** Contact with internal components if battery is opened, broken or spilled.

1. Inhalation : Remove to fresh air and provide medical oxygen/CPR if needed. Obtain medical attention.
2. Eyes contact: Immediately flush with water for at least 15minutes, hold eyelids open. obtain medical attention.
3. Skin contact: Flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary.
4. Ingestion : Do not induce vomiting. If conscious drink large amounts of water/milk. Obtain medical attention.

Never give anything by mouth to an unconscious person

**SECTION5 - FIREFIGHTING MEASURES**

**Flash Point :** Not applicable      Flammable Limits      Hydrogen      Lower      Upper  
in Air % by volume      (H2)      4.1%      74.2%  
(When charging)

**Extinguisher Media :** Class ABC, CO2 Halon      Auto-Ignition Temperature : Polypropylene 675°F

**Special Fire Fighting Procedures :** Lead-acid batteries do not burn or burn with difficulty. Do not use water on fires where molten metal is present. Extinguish fire with agent suitable for surrounding combustible materials.

Cool exterior of battery if exposed to fire to prevent rupture. The acid mist and vapors generated by heat or fire are corrosive.

Use NIOSH approved self-contained breathing apparatus (SCBA) and full protective equipment ioerated in positive-pressure mode.

**Unusual Fire and Explosion Hazards :** Hydrogen gas and sulfuric acid vapors are generated upon overcharge and polypropylene case failure. Ventilate charging areas as per ACGIH Industrial Ventilation : A Manual of Recommended Practice and National Fire Code, 1980 Vol.1, P.12, B-9, 10. Hydrogen gas may be flammable or explosive when mixed with air, oxygen, chlorine. Avoid open flames/sparks/other sources of ignition near battery. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries and do not allow metallic materials to simultaneously ontact negative and positive teminals of cells and batteries. SULFURIC ACID REACTS VIOLENTLY WITH WATER/ORGANICS.

## SECTION6 - ACCIDENTAL RELEASE MEASURES

**Procedures for Cleanup** : Stop release, if possible. Avoid contact with any spilled material. Contain spill, isolate hazard area, and deny entry. Limit site access to emergency responders. Neutralize with sodium bicarbonate, soda ash, lime or other neutralizing agent. Place battery in suitable container for disposal. Dispose of contaminated material in accordance with applicable local, applicable local, regulations. Sodium bicarbonate, soda ash, sand, lime or other neutralizing agent should be kept on-site for spill remediation.

**Personal Precautions** : Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side shields/face shield recommended. Ventilate enclosed areas.

**Environmental Precautions** : Lead and its compounds and sulfuric acid can pose a severe threat to the environment. Contamination of water, soil, and air should be prevented.

## SECTION7 - HANDLING AND STORAGE

**Precautions to be Taken in Handling and Storage** : Keep away from flames during and immediately after charging. Combustion or overcharging may create or liberate toxic and hazardous gases and liquids including hydrogen, sulfuric acid mist, sulfur dioxide, sulfur trioxide, stibine, arsine and sulfuric acid. Store batteries in cool, dry, well ventilated area. Do not short circuit battery terminals, or remove vent caps during storage or recharging. Protect battery from physical damage.

**Other Precautions** : GOOD PERSONAL HYGIENE AND WORK PRACTICES ARE MANDATORY. Refrain from eating, drinking or smoking in work areas. Thoroughly wash hands, face, neck, and arms before eating, drinking or smoking. Launder soiled clothing before reuse. Emptied batteries contain hazardous sulfuric acid residue.

## SECTION8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Respiratory Protection(Specify Type)** : Acid/gas NIOSH approved respirator is required when the PEL is exceeded or employee experiences respiratory irritation. When exposure levels are unknown or when firefighting, wear a self-contained breathing apparatus with a full face piece operated in a positive pressure mode.

**Ventilation** : Must be provided when charging in an enclosed area. Change air every 15min.

**Local Exhaust** : When PEL is exceeded.

**Mechanical(General)** : Normal mechanical ventilation recommended for stationary applications.

**Protective Gloves** : Wear rubber or plastic acid resistant gloves with elbow length gauntlet when filling batteries.

**Eye Protection** : ANSI approved safety glasses with side shields/face shield recommended safety goggles.

**Other Protective Clothing or Equipment** : Ventilation as described in the Industrial Ventilation Manual produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposures are above the PEL or TLV specified by OSHA or other local, state and federal regulations. Acid-resistant rubber or plastic apron, boots and protective clothing, safety shower and eyewash.

## SECTION9 - PHYSICAL AND CHEMICAL PROPERTIES

**Boiling Point** : Electrolyte Approx. 235°F

**Vapor Pressure** : Electrolyte 1mm Hg @ 145.8°F

**Specific Gravity** : Electrolyte 1.250-1.320 pH<2

**Melting Point** : Polypropylene <320°F

**Percent Volatile by Volume** : Not Applicable

**Vapor Density** : Hydrogen(Air=1) - 0.069

Electrolyte(Air=1) - 3.4 At STP

**Evaporation Rate** : Note Applicable

**Solubility in Water** : Electrolyte - 100% Soluble

**Reactivity in Water** : Electrolyte - water reactive(1)

### Appearance and Odor

Battery : Polypropylene or hard rubber case, solid.

Lead : Gray, metallic, solid

Electrolyte : Liquid, colorless, oily fluid; nuisance odor when got or charging battery.

## SECTION10 - STABILITY AND REACTIVITY

**Chemical stability and possibility of hazardous reaction** : Stable

**Conditions to Avoid** : High temperatures - cases decompose at < 320 °F

Avoid overcharging and smoking, or sparks near battery surface and rapid overcharge.

**Incompatibility(Materials to Avoid)** : Spark, Open flames, Keep battery case away from strong oxidizers.

**Hazardous Decomposition Products** : An explosive hydrogen/oxygen mixture within the battery may occur during charging.

Combustion can produce carbon dioxide(CO<sub>2</sub>) and carbon monoxide(CO). Molten metals produce fumes and/or vapor that may be toxic or respiratory irritants.

**Hazardous Polymerization** : Will Not Occur (Do not overcharge)

## SECTION11 - TOXICOLOGICAL INFORMATION

**Information on the likely routes of exposure** : The primary routes of exposure to lead are ingestion or inhalation of dust and fumes.

**ACUTE** :

INGESTION/INHALATION : Exposure to lead and its compounds may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, and pain in the legs, arms and joints. Kidney damage, as well as anemia, can occur from acute exposure.

**CHRONIC** :

INHALATION/INGESTION : Prolonged exposure to lead and its compounds may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia, and wrist drop.

Symptoms of central nervous system

## SECTION12 - ECOLOGICAL INFORMATION

**Aquatic and terrestrial ecotoxicity** : In most surface water and groundwater, lead forms compounds with anions such as hydroxides, carbonates, sulfates, and phosphates and precipitates out of the water column.

**Persistence and degradability** : Lead may occur as sorbed ions or surface coatings on sediment mineral particles or may be carried in colloidal particles in surface water.

**Bioaccumulative potential** : Lead(when in the dissolved phase) is bioaccumulated by plants and animals, both aquatic and terrestrial.

**Mobility in soil** : Most lead is strongly retained in soil, resulting in little mobility. Lead may be immobilized by ion exchange with hydrous oxides or clays or by chelation with humic or fulvic acids in the soil.

## SECTION13 - DISPOSAL CONSIDERATIONS

Waste Disposal Methods : Lead-acid batteries are completely recyclable. Return whole scrap batteries to distributor, manufacturer or lead smelter for recycling. For information on returning batteries to HYUNDAI SUNGWOOLITE Company for recycling call 82-54-750-7151. For neutralized spills, place residue in acid-resistant containers with sorbent material, sand or earth and dispose of in accordance with local, state and federal regulations for acid and lead compounds. Contact local and/or state environmental officials regarding disposal information.

## SECTION14 - TRANSPORT INFORMATION

U.S. DOT PROPER SHIPPING NAME : Batteries, wet filled with acid  
U.S. DOT HAZARD CLASS : 8  
U.S. DOT ID NUMBER : UN2794  
U.S. DOT PACKING GROUP :  
U.S. DOT LABEL : Corrosive  
IMO PROPER SHIPPING NAME : Batteries, wet, filled with acid  
IMO REGULATION PAGE NUMBER : 8120  
IMO U.N.CLASS : 8  
IMO U.N.NUMBER : UN2794  
IMO PACKING GROUP :  
IMO LABEL : Corrosive  
IMO VESSEL STOWAGE : A  
IATA PROPER SHIPPING NAME : Batteries, wet filled with acid  
IATA U.N.CLASS : 8  
IATA U.N.NUMBER : UN 2794  
IATA PACKING GROUP :  
IATA LABEL : Corrosive

## SECTION15 - REGULATORY INFORMATION

U.S Hazardous Under Hazard Communication Standard :	Lead : Yes	
	Sulfuric Acid : Yes	
	Polypropylene : Yes	
	Polyethylene : Yes	
Ingredients Listed on TSCA Inventory :	Yes	
CERCLA Section 304 Hazardous Substances :	Lead : Yes	RQ : NA*
	Sulfuric Acid : Yes	RQ : 1000 pounds
	Polypropylene : Yes	RQ : NA*
	Polyethylene : Yes	RQ : NA*

\*Reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100 micrometers.

EPCRA Section 302 Extremely Hazardous Substance :	Sulfuric acid : Yes
EPCRA Section 313 Toxic Release Inventory :	Lead : CAS No 7439-92-1
	Sulfuric Acid : CAS No 7664-93-9
	Polypropylene : CAS No 9003-07-0
	Polyethylene : CAS No 9002-88-4

## SECTION16 - OTHER INFORMATION

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, HYUNDAI SUNGWOOLITE. MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES. ALTHOUGH REASONABLE PRECAUTIONS HAVE BEEN TAKEN IN THE PREPARATION OF THE DATA CONTAINED HEREIN, IT IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION. THIS MATERIAL SAFETY DATA SHEET PROVIDES GUIDELINES FOR THE SAFE HANDLING AND USE OF THIS PRODUCT ; IT DOES NOT AND CANNOT ADVISE ON ALL POSSIBLE SITUATIONS, THEREFORE, YOUR SPECIFIC USE OF THIS PRODUCT SHOULD BE EVALUATED TO DETERMINE IF ADDITIONAL PRECAUTIONS ARE REQUIRED.