Safety Data Sheet SDS Ref.No.:GPSDS-Carbon-2019A

IDENTITY (As Read on Label and Line)	Notice: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.
Heavy Duty Carbon Battery	

Section I –Composition/information on ingredients

Hazardous Components (Specific Chemical Identity, Common Names)		(contents, %/wt)	CAS No.
Manganese Dioxide	(MnO_2)	20.49%	1313-13-9
Zinc	(Zn)	22.49%	7440-66-6
Zine Chloride	($ZnCL_2$)	5.89%	7646-85-7
Ammonium Chloride	(NH_4CL)	0.21%	12125-02-9
Graphite	(C)	10.53%	7782-42-5
Water	(H_2O)	14.20%	7732-18-5
Ferrum	(Fe)	21.23%	8053-60-9
Polyethylene	(PE)	1.83%	74-85-1
Polyvinyl chloride	(PVC)	1.24%	93050-82-9
Other		1.89%	
EU Battery Directive 2006-66-EC(2013-56-EU) & US104-142			
Mercury	(Hg)	< 0.0001 %	7439-97-6
Lead	(Pb)	< 0.0010%	7439-92-1
Cadmium	(Cd)	< 0.0005%	7440-43-9

Section II –Physical and chemical properties

Boiling Point KOH aqua solution = 140 °C		Specific Gravity (H_2O=1) MnO_2 = 4.4, Zn = 7.1, KOH = 2.0	
Vapor Pressure (mmHg) KOH aqua solution = 3mmHg at 20 °C		Melting Point MnO_2 decompose at 535 °C Zn = 420 °C, KOH aqua = –35 °C	
Vapor Density (Air = 1)		Evaporation Rate (Butyl Acetate = 1)	

Solubility in Water KOH – complete

Appearance and Color

MnO_2 is a black powder, Graphite is also a black powder, Zinc is a silver metal.
KOH aqua is a colorless liquid with stimulative order.

Section III –Fire-fighting measures

Flash Point (Method Used)	Flammable Limits	LEL	UEL

Incombustible	Not Available		

Extinguishing Media: See Special Fire Fighting Procedure

Special Fire Fighting Procedure: In case of fire in an adjacent area, use water, CO_2 or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products. For bulk quantities of unpackaged cells use LITH-X (Graphite Base). In this case, do not use water.
As with any fire, wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products.

Unusual Fire and Explosion Hazards

Section IV –Stability and reactivity

Stability	Unstable		Conditions to Avoid Do not short circuit, charge or dispose of in fire.
	Stable	√	

Incompatibility (Materials to Avoid) Hazardous polymerization will not occur.

Hazardous Decomposition or Byproducts Not Available

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	√	

Section V –Toxicological information

Route(s) of Entry. Inhalation? Yes Skin? Yes Ingestion? Yes

Health Hazards (Acute and Chronic) These chemicals are contained in a sealed can. Risk of exposure occurs, only if battery is mechanically or electrically abused. The most likely risk is acute exposure when a cell vents KOH is caustic alkali and attack the skin and eyes. Contact of electrolyte with skin and eyes should be avoided.

Section VI – Ecological Information

Cardnogenicity NTP? Not Available IARC Monographs? Not Available OSHA Regulated? Not Available

Signs and Symptoms of Exposure KOH can cause chemical burn upon contact with skin.

Medical Conditions Generally Aggravated by Exposure An acute exposure will not generally aggravate any medical help.

Section VII –First-aid measures

In case of skin contact with content of battery, flush immediately with water.
For eye contact, flush with copious amount of water for 10 minutes. If irritation persists, get medical help.

Section VIII - Accidental release measures

Steps to Be Taken in Case Material is Released or Spilled Wipe out by wet duster.

Section IX - Disposal considerations

General abandonment

Section X - Handling and storage

Avoid mechanical or electrical abuse.

Section XI - Hazards identification

Do not short circuit, charge or dispose of in fire. Battery may explode or leak.

Section XII - Exposure controls/personal protection

Respiratory Protection (Specify Type) Not Available

Ventilation	Local Exhaust Not Available	Special Not Available
	Mechanical (General) Not Available	Other Not Available

Protective Gloves	Butyl	Eye Protection	Safety Glasses

Other Protective Clothing or Equipment

Not Available

Work / Hygienic Practices

Not Available

Section XIII – Regulatory Information

Not Available

Section XIV – Other Information

Not Available

Section XV – Transportation Information

Heavy Duty Carbon Batteries" are considered to be "dry cell" batteries and are not listed as dangerous goods under below regulations:

1. Batteries, dry fulfills the requirement of U.S. Department of Transportation (DOT), Special Provision 130, i.e. they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals or batteries to be packed in such a way to prevent short circuits or generation of a dangerous quantity of heat.)".

2. International Civil Aviation Administration (ICAO) and International Air Transport Association (IATA Dangerous Goods Ragulation60th Edition 2019), Special Provision A123, i.e. "An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent 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 or batteries to be packed in such a way to prevent short circuits or generation of a dangerous quantity of heat.) is forbidden from transportation."

3. International Maritime Dangerous Goods Regulations (IMDG)2018 edition does not regulate these batteries.

Examples of such batteries include alkali-manganese, silver oxide, zinc carbon, nickel metal hydride and nickel-cadmium batteries.