

Safety Data Sheet

According to HCS-2012 APPENDIX D TO §1910.1200

Version: 1.0/EN

Product name: Nickel-Metal Hydride Rechargeable Battery

Revision date: 20-Aug-2019

Printing date: 20-Aug-2019

1. Identification

(a) Product identifier

Product name: Nickel-Metal Hydride Rechargeable Battery

(b) Other means of identification

Product description: Model: HFR-AA1000x3(B)
Nominal Voltage: 3.6V
Weight: 58g
Dimension: 43.6mm×50mm×14.8mm (L×W×T)

(c) Recommended use of the chemical and restrictions on use

Recommended use: Ni-MH Battery.
Restriction on use: No information available.

(d) Details of the supplier of the product

Company name(China) Shenzhen Highpower Technology Co., Ltd.
Address: Building 1, No. 68 Xinxia Road, Pinghu Town, Longgang District, Shenzhen City, Guangdong Province, P.R. China
E-mail: atp_ufo@sohu.com
Telephone: +86-755-8968 6068

(e) Emergency phone number

+86-755-8968 6068

2. Hazard(s) identification

(a) Classification of the chemical

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200). This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.

| | |
|--|-------------|
| Acute toxicity - Oral | Category 4 |
| Skin corrosion/irritation | Category 2 |
| Skin sensitization | Category 1 |
| Respiratory sensitization | Category 1 |
| Serious eye damage/eye irritation | Category 1 |
| Carcinogenicity | Category 1A |
| Specific target organ toxicity (repeated exposure) | Category 1 |

(b) GHS Label elements, including precautionary statements

Emergency Overview

Signal word

Danger

Hazard Statements

Harmful if swallowed

Causes skin irritation

May cause an allergic skin reaction

May cause allergy or asthma symptoms or breathing difficulties if inhaled

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Causes serious eye damage
May cause cancer
Causes damage to organs through prolonged or repeated exposure



This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance This is a battery. In case of rupture: the above hazards exist.

Precautionary Statements – Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves
Do not breathe dust/fume/gas/mist/vapors/spray

Precautionary Statements – Response

Specific measures (see .? on this label)
IF exposed or concerned: Get medical advice/attention
Specific treatment (see supplemental first aid instructions on this label)

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Immediately call a POISON CENTER or doctor/physician

Skin

IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention

Inhalation

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician

Ingestion: IF SWALLOWED: Call a POISON CENTER or doctor/physician.

if you feel unwell, Rinse mouth. Don't induce vomiting

Precautionary Statements – Storage: Store locked up

Precautionary Statements – Disposal: Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC): Not applicable

(c) Other information

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Very toxic to aquatic life with long lasting effects;
Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

(d) Interactions with Other Chemicals

Use of alcoholic beverages may enhance toxic effects.

3. Composition/information on ingredients

(a) Mixtures information

| Chemical name | CAS No. | Concentration% |
|--|------------|----------------|
| Nickel Hydroxide | 12054-48-7 | 22 |
| Iron | 7439-89-6 | 19.6 |
| Nickel(powder) | 7440-02-0 | 38.4 |
| Manganese | 7439-96-5 | 1.4 |
| Lanthanum | 7439-91-0 | 4.6 |
| Cobalt | 7440-48-4 | 2.13 |
| Potassium Hydroxide | 1310-58-3 | 1.92 |
| Polyethylene | 9002-88-4 | 0.5 |
| Cerium | 7440-45-1 | 0.8 |
| Neodymium | 7440-00-8 | 0.8 |
| Aluminium | 7429-90-5 | 1 |
| Sodium Hydroxide | 1310-73-2 | 1.75 |
| Lithium Hydroxide | 1310-65-2 | 0.35 |
| Poly(tetrafluoroethylene) | 9002-84-0 | 0.09 |
| Cellulose carboxymethyl ether Sodium salt | 9004-32-4 | 0.09 |
| Polypropylene | 9003-07-0 | 2.05 |
| Styrene polymer with 1,3-butadiene | 9003-55-8 | 0.45 |
| Cobalt hydroxide (Co(OH) ₂) | 21041-93-0 | 1.77 |
| Zinc-hydroxide | 20427-58-1 | 0.09 |
| Water | 7732-18-5 | 0.21 |

4. First-aid measures

(a) Description of first aid measures

| | |
|-----------------------|--|
| General Advice | First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance. Immediate medical attention is required. |
| Eye contact: | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Seek immediate medical attention/advice. |
| Skin contact: | Wash off immediately with soap and plenty of water for at least 15 minutes. May cause an allergic skin reaction. In the case of skin irritation or allergic reactions see a physician. |
| Inhalation: | Remove to fresh air. Get medical attention immediately if symptoms occur. May cause allergic respiratory reaction. If breathing has stopped, give artificial respiration. Get medical attention immediately. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. |
| Ingestion: | Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. May produce an allergic reaction. If an allergic |

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reaction occurs, stop use and seek medical help right away. Call a physician or poison control center immediately.

Self-protection of the first aider: Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8). Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

(b) Most important symptoms/effects, acute and delayed

Most important symptoms and effects: Burning sensation. Itching. Rashes. Hives. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Coughing and/ or wheezing

(c) Indication of any immediate medical attention and special treatment needed

Notes to Physician: May cause sensitization of susceptible persons. Treat symptomatically.

5. Fire-fighting measures

(a) Extinguishing media

Suitable extinguishing media: Use foam, dry powder or dry sand, CO₂ as appropriate.

Unsuitable extinguishing media: No information available.

(b) Special hazards arising from the chemical

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO, CO₂, Metal oxides, Irritating fumes

(c) Special protective equipment and precautions for fire-fighters

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filtermask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish extinguishment.

6. Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

Personal Precautions: Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Other Information: Refer to protective measures listed in Sections 7 and 8.

(b) Environmental Precautions

Environmental Precautions: Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

(c) Methods and materials for containment and cleaning up

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Methods for Containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Pick up and transfer to properly labeled containers.

7. Handling and storage

(a) Precautions for safe handling

In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment.

(b) Conditions for safe storage, including any incompatibilities

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

Incompatible Products Strong acids. Strong oxidizing agents. Strong bases.

8. Exposure controls/personal protection

(a) Control parameters

Exposure Guidelines

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|----------------------------------|--|---|--|
| Nickel hydroxide 12054-48-7 | TWA: 0.2 mg/m3 Ni inhalable fraction | TWA: 1 mg/m3 Ni (vacated) TWA: 1 mg/m3 Ni | IDLH: 10 mg/m3 Ni TWA: 0.015 mg/m3 except Nickel carbonyl Ni |
| Cobalt 7440-48-4 | TWA: 0.02 mg/m3 | TWA: 0.1 mg/m3 dust and fume (vacated) TWA: 0.05 mg/m3 dust and fume | IDLH: 20 mg/m3 dust and fume TWA: 0.05 mg/m3 dust and fume |
| Sodium hydroxide 1310-73-2 | Ceiling: 2 mg/m3 | TWA: 2 mg/m3 (vacated) Ceiling: 2 mg/m3 | IDLH: 10 mg/m3 Ceiling: 2 mg/m3 |
| Nickel 7440-02-0 | TWA: 1.5 mg/m3 | TWA: 1 mg/m3 (vacated) TWA: 1 mg/m3 | IDLH: 10 mg/m3 TWA: 0.015 mg/m3 |
| Potassium hydroxide 1310-58-3 | Ceiling: 2 mg/m3 | (vacated) Ceiling: 2 mg/m3 | Ceiling: 2 mg/m3 |
| Manganese 7439-96-5 | TWA: 0.02 mg/m3 respirable fraction TWA: 0.1 mg/m3 inhalable fraction TWA: 0.02 mg/m3 Mn TWA: 0.1 mg/m3 Mn | (vacated) TWA: 1 mg/m3 fume (vacated) STEL: 3 mg/m3 fume (vacated) Ceiling: 5 mg/m3 Ceiling: 5 mg/m3 fume Ceiling: 5 mg/m3 Mn | IDLH: 500 mg/m3 TWA: 1 mg/m3 fume STEL: 3 mg/m3 |

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value

OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits Immediately Dangerous to Life or Health

Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d

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962 (11th Cir., 1992) See section 15 for national exposure control parameters

(b) Appropriate engineering controls

Engineering Measures Showers
 Eyewash stations
 Ventilation systems

(c) Individual protection measures, such as personal protective equipment

Eye/Face Protection Face protection shield.
Skin and Body Protection Wear protective gloves and protective clothing. Long sleeved clothing. Chemical resistant apron. Impervious gloves.
Respiratory Protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.
Hygiene Measures Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product.

9. Physical and chemical properties

| | |
|---|---------------------|
| (a) Appearance | solid |
| (b) Odor | Odorless |
| (c) Odor threshold | Not available. |
| (d) pH | Not available. |
| (e) Melting point/freezing point | Not available. |
| (f) Initial boiling point and boiling range | Not available. |
| (g) Flash point | Not applicable. |
| (h) Evaporation rate | Not applicable. |
| (i) Flammability | Non flammable. |
| (j) Upper/lower flammability or explosive limits | Not available. |
| (k) Vapor pressure | Not applicable. |
| (l) Vapor density | Not available. |
| (m) Relative density | Not available. |
| (n) Solubility(ies) | Insoluble in water. |
| (o) Partition coefficient: n-octanol/water | Not available. |
| (p) Auto-ignition temperature | Not available. |
| (q) Decomposition temperature | Not available. |
| (r) Viscosity | Not available. |

10. Stability and reactivity

(a) Reactivity

No data available.

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(b) Chemical stability

Stable under recommended storage conditions.

(c) Possibility of hazardous reactions

None under normal processing.

(d) Conditions to avoid

None known based on information supplied.

(e) Incompatible materials

Strong acids. Strong oxidizing agents. Strong bases.

(f) Hazardous decomposition products

Carbon oxides.

11. Toxicological information

(a) Information on the likely routes of exposure

Product Information

Product does not present an acute toxicity hazard based on known or supplied information.

In case of rupture:

Inhalation:

Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract. May cause sensitization of susceptible persons. (based on components)

Ingestion:

Specific test data for the substance or mixture is not available. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May be harmful if swallowed. (based on components). May cause additional affects as listed under "Inhalation".

Skin contact:

Specific test data for the substance or mixture is not available. Expected to be an irritant based on components. Irritating to skin. Prolonged contact may cause redness and irritation. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. (based on components).

Eye contact:

Specific test data for the substance or mixture is not available. Expected to be an irritant based on components. Severely irritating to eyes. Causes serious eye damage. May cause burns. May cause irreversible damage to eyes.

Component Information

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|--------------------------------|----------------------|-------------------------|---|
| Nickel hydroxide 12054-48-7 | | | = 1200 mg/m ³ (Rat) 4 h |
| Nickel 7440-02-0 | > 9000 mg/kg (Rat) | | |
| Cobalt 7440-48-4 | = 6170 mg/kg (Rat) | | > 10 mg/L (Rat) 1 h |
| Sodium hydroxide | | = 1350 mg/kg (Rabbit) | |

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| | | | |
|----------------------------------|---------------------|--|--|
| 1310-73-2 | | | |
| Potassium hydroxide 1310-58-3 | = 214 mg/kg (Rat) | | |

(b) Information on toxicological characteristics

Symptoms

Erythema (skin redness). May cause redness and tearing of the eyes. May cause blindness. Burning. Itching. Rashes. Hives. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing. Coughing and/ or wheezing.

(C) Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization

May cause sensitization of susceptible persons. May cause sensitization by skin contact. May cause sensitization by inhalation.

Mutagenic Effects

No information available.

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Chemical Name | ACGIH | IARC | NTP | OSHA |
|--------------------------------|-------|----------------------|------------------------|------|
| Nickel hydroxide 12054-48-7 | A1 | Group 1 | Known | X |
| Nickel 7440-02-0 | | Group 2B | Reasonably Anticipated | X |
| Cobalt 7440-48-4 | A3 | Group 2A Group 2B | | X |

ACGIH (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

Reproductive Toxicity

No information available

STOT - single exposure

No information available

STOT - repeated exposure

Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).

Chronic Toxicity

No known effect based on information supplied. Prolonged exposure may cause chronic effects. Repeated contact may cause allergic reactions in very susceptible persons. Contains a known or suspected mutagen. Possible risk

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| | |
|----------------------|--|
| Target Organ Effects | of irreversible effects. Contains a known or suspected carcinogen. Contains a known or suspected reproductive toxin. Avoid repeated exposure. May cause adverse effects on the bone marrow and blood-forming system. |
| Aspiration Hazard | Respiratory system. Eyes. Skin. May affect the genetic material in germ cells (sperm and eggs). Gastrointestinal tract (GI). Reproductive System. Blood. Central Nervous System (CNS). Kidney. Lungs. Nasal cavities. No information available. |

12. Ecological information

(a) Ecotoxicity

Very toxic to aquatic life with long lasting effects.

| Chemical Name | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Daphnia Magna (Water Flea) |
|----------------------------------|--|---|----------------------------|--|
| Nickel 7440-02-0 | 72h EC50: = 0.18 mg/L (Pseudokirchneriella subcapitata) 96h EC50: 0.174 - 0.311 mg/L (Pseudokirchneriella subcapitata) | 96h LC50: > 100 mg/L (Brachydanio rerio) 96h LC50: = 1.3 mg/L (Cyprinus carpio) 96h LC50: = 10.4 mg/L (Cyprinus carpio) | | 48h EC50: > 100 mg/L 48h EC50: = 1 mg/L |
| Cobalt 7440-48-4 | | 96h LC50: > 100 mg/L (Brachydanio rerio) | | |
| Sodium hydroxide 1310-73-2 | | 96h LC50: = 45.4 mg/L (Oncorhynchus mykiss) | | |
| Potassium hydroxide 1310-58-3 | | 96h LC50: = 80 mg/L (Gambusia affinis) | | |

(b) Persistence and Degradability

No information available.

(c) Bioaccumulative potential

No information available.

(d) Other adverse effects

No information available.

13. Disposal considerations

(a) Waste treatment methods

Disposal methods This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging Dispose of contents/containers in accordance with local regulations

| Chemical Name | RCRA | RCRA - Basis for | RCRA - D Series | RCRA - U Series |
|---------------|------|------------------|-----------------|-----------------|
| | | | | |

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| | | Listing | Wastes | Wastes |
|--------------------------------|--|--|--------|--------|
| Nickel 7440-02-0 | (hazardous constituent - no waste number) | Included in waste streams: F006, F039 | | |
| Nickel hydroxide 12054-48-7 | (hazardous constituent - no waste number) | | | |

California Hazardous Waste 141

Codes

This product contains one or more substances that are listed with the State of California as a hazardous waste.

| Chemical Name | California Hazardous Waste |
|----------------------------------|----------------------------------|
| Cobalt 7440-48-4 | Toxic powder Ignitable powder |
| Nickel 7440-02-0 | Toxic powder Ignitable powder |
| Sodium hydroxide 1310-73-2 | Toxic Corrosive |
| Potassium hydroxide 1310-58-3 | Toxic Corrosive |
| Manganese 7439-96-5 | Ignitable powder |

14. Transport information

| | |
|-----------------------------|---|
| DOT | NOT REGULATED |
| Proper Shipping Name | NON REGULATED |
| Hazard Class | N/A |
| TDG | Not regulated |
| MEX | Not regulated |
| ICAO | Not regulated |
| IATA | Not regulated |
| Proper Shipping Name | NON REGULATED |
| Hazard Class | N/A |
| IMDG/IMO | Not regulated |
| Hazard Class | N/A |
| Marine Pollutant | Product is a marine pollutant according to the criteria set by IMDG/IMO |
| RID | Not regulated |
| ADR | Not regulated |
| ADN | Not regulated |

15. Regulatory information

(a) Safety, health and environmental regulations specific for the product in question

| CAS No. | USA TSCA | EU EINECS | Japan ENCS | Korea ECL | China IECSC | Canada DSL |
|------------|-------------|--------------|---------------|--------------|----------------|---------------|
| 7440-02-0 | Listed | Listed | Listed | Listed | Listed | Listed |
| 12054-48-7 | Listed | Not listed | Listed | Listed | Listed | Listed |
| 7440-48-4 | Listed | Listed | Listed | Listed | Listed | Listed |

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| | | | | | | |
|-----------|--------|------------|------------|--------|--------|------------|
| 7439-96-5 | Listed | Not listed | Listed | Listed | Listed | Listed |
| 7439-91-0 | Listed | Listed | Not listed | Listed | Listed | Not listed |
| 7440-45-1 | Listed | Not listed | Listed | Listed | Listed | Not listed |
| 7440-00-8 | Listed | Listed | Listed | Listed | Listed | Not listed |
| 1310-58-3 | Listed | Listed | Listed | Listed | Listed | Not listed |
| 1310-73-2 | Listed | Listed | Listed | Listed | Listed | Listed |
| 1310-65-2 | Listed | Listed | Listed | Listed | Listed | Listed |

16. Other information, including date of preparation or last revision

(a) Preparation and revision information

Date of previous revision: Not applicable.

Date of this revision: 20-Aug-2019

Revision summary: The first New SDS

(b) Abbreviations and acronyms

TSCA: Toxic Substances Control Act, The American chemical inventory.
DSL Domestic Substances List
EINECS: European Inventory of Existing Commercial chemical Substances
ENCS Japanese Existing and New Chemical Substances
ECL: Existing Chemicals List, the Korean chemical inventory.
IECSC: Inventory of existing chemical substances in China.

(c) Disclaimer

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard. The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

----- End of the SDS -----