1. IDENTIFICATION

Product Name: HYDROGEN PEROXIDE SOLUTION - 10 VOLUME 3%

Manufacturer: RW Packaging Ltd.
200 Omand’s Creek Blvd.
Winnipeg, Manitoba
Canada R2R 1V7
Ph: (204) 786-6873

Emergency Telephone No.: (613) 996-6666 (Canutec)

Composition/Purity of Hazardous Ingredients: 2.3-3.5% Hydrogen Peroxide

IUPAC Chemical Name: Hydrogen Peroxide

Synonym(s): Albone, perone, hydrogen dioxide, perhydrol, hydperoxide, peroxide

CAS Registry Number: 7722-84-1

PIN-UN/NA Number(s): Not regulated

TDG Classification (Class, Division and Packing Group): N/A

Chemical Family: Organic peroxide

Molecular Formula: H₂O₂

Structural Formula: HO-OH

WHMIS Classification: D2A, C

Warning Properties: Toxic and an oxidizer

General Descriptions
Appearance, Odour and State: Clear, water-like liquid with a slight characteristic odour.

Odour Threshold: No data

Uses and Occurrences: Used as is as a disinfectant for cuts, sores and wounds; to relieve itching from mosquito bites; to treat water; pharmaceuticals.

2. PHYSICAL DATA

Boiling Point: 107.8 deg. C
Molecular Weight: 34.01
Melting Point/Freezing Point: -32 deg. C
Specific Gravity (Water=1): 1.132 @ 20 deg. C
Solubility in Water: Miscible in all proportions.
pH: less than 5 (acidic)
Solubility in Other Liquids: Soluble in alcohols and ethers.
Vapour Density (Air-1): 1.2
Vapour Pressure 23 mm Hg (TORR) @ 30 deg. C (0.66 kp)

% Volatiles: No Data
Saturation Vapour Concentration: No Data
Evaporation Rate (Butyl Acetate=1): No Data
Co-efficient of Water/Oil Distribution: No data

3. FIRE AND EXPLOSION HAZARDS

Flash Point and Method: Non-flammable
Lower Explosive Limit/Lower Flammable Limit (%): Hydrogen peroxide vapour can be exploded under appropriate conditions when the vapour concentration reaches 26 mole percent
Upper Explosive Limit/Upper Flammable Limit (%): No data
Autoignition Temperature: N/A
Extinguishing Media: Water

Special Fire Fighting Procedures: Use water only to cool down and dilute containers. At higher temperatures, rapid
decomposition can lead to explosion or rupture of sealed units. Some chemical extinguishing agents can enhance the decomposition rate. Hydrogen peroxide is a corrosive; field protective gear should be worn.

Combustion Products (thermal):
Decomposition Products: Oxygen - can accelerate the burning of flammable materials or cause spontaneous combustion.

Hazardous Explosion Data
- Sensitivity to Impact: No Data
- Sensitivity to Static Discharge: Note: Although hydrogen peroxide uncontaminated and in pure state does not exhibit high explosibility, trace amounts of organic peroxides are very sensitive to detonation. However, some organic peroxides only become dangerous complexes if the right components are involved, in the right ratios in the absence of sufficient water.

4. REACTIVITY DATA


Incompatibility: Any flammable liquids, oxidizing agents (reducers) such as permaganates, nitrates and trace quantities of some metals such as iron, bronze, brass, lead, copper, zinc, chromium and manganese nickel. Can react spontaneously and explosively with organics material such as ketones, aldehydes, charcoal or dust from organic material. Note: Rate of decomposition doubles for each 10 deg. C. increase.

Hazardous Decomposition Products: Oxygen.

Hazardous Polymerization: Does not occur.
Corrosiveness to Metals: Does react with steel, but does not react with aluminum. Does react violently with those metals listed under incompatibility.

5. HEALTH HAZARD DATA

A. Routes of Entry

<table>
<thead>
<tr>
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<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>i) Inhalation</td>
<td>X</td>
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<tr>
<td>ii) Eye Contact</td>
<td>X</td>
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<tr>
<td>iii) Skin Contact</td>
<td>X</td>
<td></td>
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<tr>
<td>iv) Skin Absorption</td>
<td>X</td>
<td></td>
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<tr>
<td>v) Ingestion</td>
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B. Effects of Short-Term (Acute Exposure)

Inhalation: may cause coughing, headache, salivation and dizziness. Irritation of respiratory tract ranging from mild irritation and bronchitis to severe irritation of the nose, throat and pulmonary edema (fluid in the lung).

Eye Contact: Concentrated vapour or mist causes stinging; reddening and inflammation, which may result in severe eye injury and possible blindness. Splashes of solutions < 3% causes pain but no damage. Splashes of solutions >3% can result in corneal ulceration (damage). Onset of symptoms.

Skin Contact: Contact with liquid can cause bleaching. It also causes blistering and reddening. If contact with the skin is relatively short, no damage will result beyond a temporary whitening or bleaching accompanied by a tingling sensation. This is due to the diffusion of hydrogen peroxide into the skin and subsequent disassociation thereunder, forming oxygen bubbles, which appear white due to refraction. Washing with water immediately after contact will reduce the amount of bleaching. Bleaching of this sort is not damaging as is the injury.
In contact with acid or hypochlorite. This skin returns to normal within 2-3 hours of washing.

**Ingestion:** Can cause blistering and bleeding from throat and stomach. The ingested hydrogen peroxide may evolve large quantities of oxygen which could hyper distend the gastro intestinal tract and may cause internal bleeding.

### C. Animal Toxicity Data

**Toxicity:** Oral mouse LD-50 2g/kg inhalation, rat LC-50 2000 mg/m$^3$/4 hours.

### D. Effects of Long-Term (Chronic) Exposure

**Irritancy of Product:** Hydrogen Peroxide is corrosive to skin; the more concentrated - the more corrosive.

**Ingestion/Inhalation:** Excess quantities can cause pain, vomiting, tissue damage which if severe enough can result in shock and death.

**Sensitizing Capability:** No Data

**Carcinogenicity:** No human data, but some reported positive results in animal testing

**Mutagenicity:** Some positive results in short-term tests.

**Teratogenicity:** No positive results.

**Synergistic Materials:** No Data

### E. Occupational Exposure Limits

**Threshold Limited Values (TLV):** ACGIH

**Time-Weighted Average (TLV-TWA):** 1ppm (1.5 mg/m$^3$)

**Short-Term Exposure Limit (TLV-STEL):** 22 ppm (30.7 mg/m$^3$)
6. **FIRST AID**

**IN ALL CASES GET IMMEDIATE MEDICAL ATTENTION!**

**Inhalation:** Move victim to fresh air. Give artificial respiration if not breathing.

**Eye Contact:** Immediately flush eye with running water for 20 minutes holding the eyelids open.

**Skin Contact:** Avoid direct contact with this chemical. Flush affected areas with running water for 20 minutes. Remove contaminated clothing as soon as possible.

**Ingestion:** Rinse mouth with water immediately. If conscious give large amounts of water to dilute stomach contents.

**Special Equipment/Antidotes:** None

**First Aid Comments:** Consult a physician and Poison Control Centre for all major exposures

7. **PREVENTATIVE MEASURES**

**A. Environmental and Disposal Information**

**Spill and Leak Procedures:** Restrict access to area until after clean up is complete by trained personnel only. Ventilate area and ensure clean up personnel wear adequate protective equipment. Eliminate all ignition sources and remove all combustibles. Stop or reduce leak if safe to do so. For small spills, flush with plenty of water. For large spills, dike with inert material. Remove liquid with compatible pumps or vacuum equipment. Place in appropriate covered drums. Flush areas with excess water. Neutralize contaminated \( \text{H}_2\text{O}_2 \) by slowly adding dilute sodium sulphite or sodium bisulphite.
Disposal:
Review Federal and Provincial and local government requirements prior to disposal. May be possible to neutralize with large quantities of water and dispose in the sewer. Although Hydrogen peroxide is used for supplemental oxygen other applications in waste water disposal systems, large quantities put into streams and rivers (over 40 ppm) could adversely affect aquatic fauna.

B. Storage and Handling

Storage: Store in clean, cool, well ventilated area away from incompatibles (See Reactivity Data). Do not store near heat or contamination sources. May attack some forms of plastics, rubber and coatings. Combustibles in contact with oxygen will readily burst into flame.

Handling: Protect containers from damage. Ensure containers can be vented. Drums should not be stacked. Hydrogen Peroxide removed from the container should not be returned to original container. Containers should be handled in an upright position. All materials that come in contact with Hydrogen Peroxide should be “passivated” – pre-treated with detergent and/or acid and water flushed to ensure no trace contaminants can catalyze $\text{H}_2\text{O}_2$ decomposition. Because of the strong oxidizing nature of hydrogen peroxide protective hand creams should not be worn.

Exposure Control: no comment

Engineering Controls: These are the preferred controls. Adequate ventilation, personal enclosure, control of process conditions, building design (concrete floor, availability of water for cleaning up spills and eyewash and safety showers) etc
C. **Personal Protective Equipment**

Respiratory Protection: Supplied - air respirator approved by NIOSH/MSHA for concentrations up to 10 ppm. Over 10 ppm, use a SCBA with full-face piece.

Respiratory Protection Guidelines: In situations of unknown H₂O₂ concentrations, use a NIOSH approved SCBA device with full-face piece.

Eye/Face Protection: Chemical goggles and face shield.

Skin Protection: For normal situations appropriate clothing and impermeable boots and gloves plus a hard hat. In large spills or IDLH (immediately dangerous to life or health) situations, a fully encompassing body suit may be necessary.

Resistance of Materials for Protective Clothing: Neoprene, butyl rubber or vinyl gloves.

Personal Protection Comments: None

8. **REFERENCES**

- NIOSH Pocket Guide to Chemical Hazards
- Canada Centre for Occupational Health and Safety.
- Trade names - Database
- CHEMINFO - Database
- RTECS - Database
- Supplier Material Safety Data Sheets
- Manufacturing Chemists Association - Material Safety Data Sheets.
- American Conference of Governmental Industrial Hygienists Handbook of Threshold Limit Values and Biological Indices.

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