



Hydrogen Peroxide (31%)

Date: February 18, 2015

Safety Data Sheet

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SECTION 1 - IDENTIFICATION OF SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

SDS REVISION #: 003

1.1 PRODUCT IDENTIFIER

Trade Name: Hydrogen Peroxide (31%)
Substance name: Hydrogen peroxide
Other names: Hydrogen dioxide; Hydroperoxide; Hydrogen peroxide, solution
REACH Registration: 01-2119485845-22-0027
CAS#: 7722-84-1
EC Number: 231-765-0
EU Index Number: 008-003-00-9
Chemical Formula: H₂O₂

1.2 RELEVANT IDENTIFIED USES

Relevant use: Industrial use - electronics manufacturing, bleaching agent, water treatment, odor treatment, oxidizing agent
Use advised against: Unknown

1.3 MANUFACTURER: MGC Pure Chemicals America, Inc.
6560 South Mountain Road
Mesa, AZ 85212-9716

1.4 PHONE NUMBERS: Inquiries (480) 987-9100 (US)
81-3-3283-4755 (Japan)
Transportation emergencies - Chemtrec
(800) 424-9300 (in the US)
011-703-527-3887

1.5 EMAIL ADDRESS: contact@mgcpure.com

SECTION 2 - HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF THE SUBSTANCE (EC 1272/2008):

Human health
 Serious eye damage (Category 1) – H318
 Acute toxicity, oral (Category 4) – H302
Physical & Chemical Hazards
 Oxidizing Liquid (Category 2) – H272
Environment
 Not classified

Classification (67/548/EEC): Xn;R22. Xi;R41. O;R8
The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

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SECTION 2 - HAZARDS IDENTIFICATION (continued)

2.2 LABEL ELEMENTS:

EC Number: 231-765-0

Pictograms:



Signal Word: Danger!

Hazard Statements: Causes serious eye damage (H318). Harmful if swallowed (H302). May intensify a fire; oxidizer (H272)

Precautionary Statements:

Prevention

Wear protective gloves/protective clothing/eye protection/face protection (P280). Wash contaminated skin thoroughly after handling (P264). Take any precaution to avoid mixing with combustibles (P221). Keep away from heat/sparks/open flames/hot surfaces. - No smoking (P210). Keep away from combustible materials (P220). Do not eat, drink or smoke when using this product (P270).

Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing (P305+351+338). Immediately call a POISON CENTER or doctor/physician (P310). IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell (P301+312). Rinse mouth (P330). In case of fire: Use foam, carbon dioxide, dry powder or water fog for extinction. (P370+378)

Storage

Not applicable

Disposal

Dispose of contents/container in accordance with local regulations (P501).

2.3 HAZARDS NOT OTHERWISE CLASSIFIED:
Not Classified as PBT/vPvB by current EU criteria.



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SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| <u>Substance</u> | <u>%</u> | <u>CAS#</u> | <u>EC#</u> | <u>Index#</u> | <u>Reach Reg.#</u> |
|-------------------|----------|-------------|------------|---------------|-----------------------|
| Hydrogen peroxide | 31 | 7722-84-1 | 231-765-0 | 008-003-00-9 | 01-2119485845-22-0027 |
| Water | 69 | 7732-18-5 | | | |

SECTION 4 - FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES

In Case Of Eye Contact: Immediately flush with large amounts of water for at least 15 minutes, lifting upper and lower lids occasionally. Get immediate medical attention. Do **not** use chemical antidote.

In Case Of Skin Contact: Flush with large amounts of water. If irritation persists, or open sores develop, contact a physician. Remove contaminated clothing and launder before re-use.

If Swallowed: Immediately drink two large glasses of water. Do **not** induce vomiting. Never give anything by mouth to an unconscious person. Contact a physician.

If Inhaled: If affected, move to fresh air. If breathing has stopped, give artificial respiration and call a physician.

4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS:

This material causes serious eye damage and may cause skin irritation. If inhaled, it may cause irritation to the respiratory tract. Contact may result in the bleaching of skin and hair. Harmful if swallowed.

4.3 NOTES TO PHYSICIAN:

Hydrogen peroxide, at this concentration, is a strong oxidant. Direct contact with the eye is likely to cause corneal damage especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion, and the unlikelihood of systemic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is a remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation.

Pulmonary edema may be delayed for 24-72 hours after inhalation of excessive amounts.



SECTION 5 - FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES:

This material is an oxidizer. Although this product will not burn, it releases large quantities of oxygen, which can intensify a fire. Contact between this product and organic liquids or vapors may result in fire or explosion.



5.2 EXTINGUISHING MEDIA:

Use media appropriate for other materials involved in the fire. Dilute with large amounts of water, if safe to do so, to reduce the potential for re-ignition. Do not use organic materials which may react with the product.

5.3 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE

This material is a strong oxidizer. Although this product will not burn, it releases large quantities of oxygen, which can intensify a fire. Contact between this product and organic liquids or vapors may result in fire or explosion.

5.4 ADVICE FOR FIREFIGHTERS:

Keep personnel removed from and upwind. Wear full protective clothing and self-contained breathing apparatus with full face-piece. Flood area with lots of water. Cool containers with water.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

6.1 PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES:

Persons not wearing protective equipment should be excluded from the area of the spill until cleanup has been completed.

6.2 ENVIRONMENTAL PRECAUTIONS:

Avoid discharge to the aquatic environment.

6.3 CONTAINMENT & CLEAN-UP:

Dike area of spill with sand or dirt to prevent spreading and prevent contact with organic materials. Pump liquid to a salvage tank for treatment and disposal. Dilute remaining liquid to 5-10% hydrogen peroxide and neutralize with sodium metabisulfite or sodium sulfite. Remaining liquid may be absorbed on vermiculite or other non-combustible material and shoveled into containers.

Caution: material absorbed on absorbent may continue liberating oxygen. Do not seal containers. Do not store containers near combustible materials.

6.4 REFERNECE TO OTHER SECTIONS:

See Section 8 for appropriate protective equipment



SECTION 7 - HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:

Use caution when handling this material; product may react explosively with organic liquids or vapors. Avoid contact with flammable or combustible materials. Avoid contamination from any source including metals, dust and organic materials. Do not return used or unused peroxide to original container; dispose of in accordance with Section 13 - Disposal Considerations. This product is an oxidizer, which may liberate oxygen and promote combustion of flammable materials. Avoid concentrating hydrogen peroxide by removal of water. Drying of product on combustible material may cause fire or explosion.

Avoid contact with skin, eyes and clothing. Avoid inhalation of vapors. Wash thoroughly after handling.

7.2 CONDITIONS FOR SAFE STORAGE:

Store only in vented containers. Store in a cool, dry, well-ventilated area, away from flammable or combustible materials. Have a source of water available near the storage area. Check storage area periodically for bulging containers. For shelf-life limitations and recommendations – contact supplier.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS:

Hydrogen peroxide
(CAS# 7722-84-1)

OSHA PEL - 1 ppm (1.4 mg/M³)
ACGIH TLV - 1 ppm (1.4 mg/M³)
NIOSH REL - 1 ppm (1.4 mg/M³)
OEL (8-hr.) - 1 ppm (1.4 mg/M³)
OEL (15 min.) – 2 ppm (4.8 mg/M³)

OEL = Occupational Exposure Limit

8.2 EXPOSURE CONTROLS:

Engineering Controls: Provide sufficient ventilation to maintain exposure below established exposure limits.

Eye / Face Protection: Chemical splash goggles in compliance with OSHA regulations and full face-shield made of polycarbonate, acetate, polycarbonate/acetate, PETG or thermoplastic, are advised.

Section 8 continued on next page



SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION (continued)

Skin Protection: Wear impervious clothing such as a protective suit made of rubber, Gore-Tex, or a specialized HAZMAT suit (Level A, B, or C). For foot protection, wear approved boots made of rubber, PVC, or neoprene. DO NOT wear any form of boot made of nylon or nylon blends. For hand protection, wear approved gloves made of nitrile, PVC, or neoprene. DO NOT use cotton, wool or leather, as these materials react RAPIDLY with higher concentrations of hydrogen peroxide.

Completely submerge contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in a fire.

Respiratory Protection: A NIOSH/MSHA approved respirator is recommended if there is insufficient ventilation to maintain exposures below established exposure limits. Do not use an air-purifying respirator.

Environmental Exposure Controls: None known

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid @ 77° F (25° C)

Odor: Slightly pungent, irritating

Odor Threshold: Unavailable

pH: 3-4

Freezing Point: -15° F (-26° C)

Initial Boiling Point: 223° F (106° C) @ 760 mm Hg

Flash Point: None - Closed Cup

Evaporation Rate: Slower (Ethyl Ether = 1)

Upper Explosion Limit: Unavailable

Lower Explosion Limit: Unavailable

Vapor Pressure (mm Hg): 22 @ 86° F (30° C)

Vapor Density (Air = 1): Unavailable

Relative Density (H₂O=1): ~1.11 @ 68° F (20° C)

Solubility in Water: Complete

Partition Coefficient: Unavailable (n-octanol/water)

Autoignition Temperature: Not combustible

Decomposition Temperature: Unavailable

Viscosity: Unavailable

SECTION 10 - STABILITY AND REACTIVITY

10.1 REACTIVITY:

Contact with organic substances may cause fire or explosion. Contact with metals, metallic ions, alkalis, reducing agents and organic matter (such as alcohols or terpenes) may produce self-accelerated thermal decomposition.

Section 10 continued on next page



SECTION 10 - STABILITY AND REACTIVITY (continued)

- 10.2 CHEMICAL STABILITY:
Stable under normal conditions; however, heat or contamination may result in decomposition, which may be violent.
- 10.3 POSSIBILITY OF HAZARDOUS REACTIONS:
Reacts with combustible materials or organic materials, releasing heat and oxygen. Contact with metals, metallic ions, alkalis, reducing agents and organic matter (such as alcohols or terpenes) may produce self-accelerated thermal decomposition.
- 10.4 CONDITIONS TO AVOID:
Heat or contamination may result in decomposition, which may be violent.
- 10.5 INCOMPATIBLE MATERIALS:
Avoid contact with combustible materials, copper alloys, galvanized iron, strong reducing agents heavy metals, iron, copper alloys. Contact with metals, metallic ions, alkalis, reducing agents and organic matter (such as alcohols or terpenes) may produce self-accelerated thermal decomposition.
- 10.6 HAZARDOUS DECOMPOSITION PRODUCTS:
Decomposition releases large quantities of oxygen and steam, which may cause containers to rupture and intensify a fire.

SECTION 11 - TOXICOLOGICAL INFORMATION

- 11.1 LIKELY ROUTES OF EXPOSURE:
Skin and eye contact and inhalation
- 11.2 SYMPTOMS:
Skin contact: Redness
Eye contact: Pain, redness, tearing and irritation
Inhalation: Coughing and irritation of the nose and throat
- 11.3 EFFECTS FROM EXPOSURE:
Immediate: Causes serious eye damage and skin irritation. May cause irritation to the nose and respiratory tract. Can cause bleaching of skin and hair.
Delayed: Damage to lungs
Chronic: Unavailable

Section 11 continued on next page



SECTION 11 - TOXICOLOGICAL INFORMATION (continued)

11.4 TOXICITY DATA (hydrogen peroxide):

Acute toxicity

- Oral LD₅₀ (male rats) - 1,518 mg/kg (9.6% H₂O₂)
- Oral LD₅₀ (male rats) - 1193 mg/kg (35% H₂O₂)
- Dermal LD₅₀ (rabbits) - >2,000 mg/kg (35% H₂O₂)
- Inhalation LC₅₀ (rats) - >2,000 ppm (90% H₂O₂)

Eye irritation

- Irritating at concentrations of 5% or less
- Severely irritating to corrosive at concentrations of 5% or more

Skin irritation

- Corrosive at concentrations of 50% or more

Sensitization

- Not a skin sensitizer

Subacute toxicity

Male rats were administered 60 mg/kg/day (0.6% H₂O₂). Suppression in growth rate observed after day 20.

Male rats were administered 56.2 mg/kg/day (5% H₂O₂) for twelve weeks. No adverse effects noted.

Carcinogenicity

Mice were administered water containing 0.1 and 0.4% H₂O₂ for a period of 740 days. Some mice have developed duodenal cancer. FDA and other organizations have reviewed this study and concluded that there is insufficient evidence that hydrogen peroxide is carcinogenic.

Rats were administered water containing 0.3 and 0.6% H₂O₂ for a period of 78 weeks. No carcinogenic effects were noted.

Mutagenicity

Weak mutagenicity-inducing property to *salmonella* and *typhimurium* bacteria

Reproductive toxicity

Female rats treated with 10% H₂O₂ produced offspring of lower body weight and some structural abnormalities. These changes were attributed to maternal toxicity.

Other limited animal studies demonstrate no reproductive toxicity.



SECTION 11 - TOXICOLOGICAL INFORMATION (continued)

11.5 CARCINOGENICITY

The International Agency for Research on Cancer (IARC) has concluded that there is inadequate evidence for carcinogenicity of hydrogen peroxide in humans, but limited evidence in experimental animals (Group 3 - not classifiable as to its carcinogenicity to humans). The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that hydrogen peroxide is a 'Confirmed Animal Carcinogen with unknown Relevance to Humans' (A3). Hydrogen peroxide is not regulated by OSHA as a carcinogen, nor is it listed in NTP.

SECTION 12 - ECOLOGICAL INFORMATION

12.1 ECOTOXICITY (hydrogen peroxide):

Hydrogen peroxide is naturally produced by sunlight (between 0.1 and 4 ppb in air and 0.001 to 0.1 mg/L in water). Not expected to have significant environmental effects.

Aquatic toxicity (saltwater)

24-hr. LC₅₀ (Rabbit fish) - 224 mg/L

24-hr. LC₅₀ (Striped triple-tooth goby) - 155 mg/L

24-hr. LC₅₀ (Yellowfin horse mackerel) - 89 mg/L

Aquatic toxicity (fresh water)

48-hr. LC₅₀ (Carp) - 41 mg/L

96-hr. LC₅₀ (Catfish) - 37.4 mg/L

Algal toxicity

72-96 hr. EC₅₀ (various species) – 3.7-160 mg/L (fresh water)

72-96 hr. EC₅₀ (*Nitzschia closterium*) – 0.87 mg/L (salt water)

11.2 PERSISTENCE AND BIODEGRADABILITY

Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in freshwater ranged from 8 hours to 20 days, in air from 10 - 20 hours, and in soils from minutes to hours depending upon microbiological activity and metal contamination.

11.3 BIOACCUMULATIVE POTENTIAL:

Not bioaccumulative

11.4 MOBILITY IN SOIL:

Will likely be mobile in the environment due to its water solubility

11.5 PBT and vPvT ASSESSMENT:

Not Classified as PBT/vPvB by current EU criteria.

11.6 OTHER ADVERSE EFFECTS:

Decomposes into oxygen and water. No adverse effects expected.



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SECTION 13 - DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable local, state and federal regulations. Material should be sent to a registered hazardous waste treatment facility for disposal. Hydrogen peroxide should be treated by diluting to a concentration of 5-10%, then reacting with a reducing agent such as sodium sulfite or sodium metabisulfite.

This product, if disposed of, is considered an ignitable waste (D001) under current RCRA regulations.

SECTION 14 - TRANSPORT INFORMATION

14.1 U.S. DOT, TDG (CANADIAN), ICAO (AIR), IMO (WATER) ADR/RID/ADN (European) TRANSPORT REGULATIONS:

| | |
|---------------------------|---|
| UN Number: | UN 2014 |
| Shipping Name: | Hydrogen peroxide, aqueous solutions (30-34%) |
| Hazard Class: | 5.1 |
| Subsidiary Risk: | (8) |
| Packing Group: | II |
| Reportable quantity (US): | None |
| Marine Pollutant: | No |

Labeling:



14.2 ENVIRONMENTAL HAZARDS

| | |
|--------------------------------------|------|
| Reportable quantity (US): | None |
| Marine Pollutant: | No |
| Environmentally Hazardous Substance: | No |

14.3 SPECIAL PRECAUTIONS FOR USER

| | |
|--------------------------|----------|
| EMS: | F-H, S-Q |
| Emergency Access Code: | 2P |
| Hazard Number: | 58 |
| Tunnel Restriction Code: | (E) |

14.4 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL73/78 & IBC CODE Not applicable



SECTION 15 - REGULATORY INFORMATION

15.1. EU SAFETY, HEALTH & ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Dangerous Substance Directive 67/548/EEC
Dangerous Preparations Directive 1999/45/EC
(EC) No 1907/2006 (REACH).
(EC) No 1272/2008 (CLP)
(EU) No 453/2010

15.2. CHEMICAL SAFETY ASSESSMENT

A chemical safety assessment has been carried out.

15.3. CHEMICAL INVENTORIES

TSCA (US): All components in this product are in compliance with the TSCA Inventory requirements.

EINECS (Europe): All components in this product are listed on the European Inventory of Existing Chemical Substance (231-765-0).

CEPA (Canada): All components in this product are listed on the Canadian Domestic Substances List (DSL).

15.4. US ENVIRONMENTAL REGULATIONS:

SARA

CERCLA/SARA 302: Hydrogen peroxide (CAS# 7722-84-1) TPQ – 1000#

CERCLA/SARA 311/312: Acute, fire

CERCLA/SARA 313: Not applicable

CALIFORNIA PROPOSITION 65:

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.



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SECTION 16 - OTHER INFORMATION

HMIS HAZARD RATING: Health – 3, Fire – 0, Physical hazard - 1

RISK PHRASES IN FULL

NC Not classified. R22 Harmful if swallowed. R41 Risk of serious damage to eyes. R8 Contact with combustible material may cause fire.

HAZARD STATEMENTS IN FULL

H272 May intensify fire; oxidizer. H302 Harmful if swallowed. H318 Causes serious eye damage.

PREPARATION DATE: February 18, 2015

SUPERCEDES: Revision 2, dated August 1, 2013

REASON FOR REVISION: Updated to comply with EU requirements

The product information contained herein is believed to be accurate as of the date of the Safety Data Sheet, and is provided without warranty, expressed or implied, as to the results of use of this information or the product to which it relates. Recipient assumes all responsibility for the use of this information and the use (alone or in combination with any other product), storage or disposal of the product, including any resultant personal injury or property damage.

****END OF REPORT****