

SAFETY DATA SHEET

Hydrogen Peroxide 90% HTP

SDS # : 7722-84-1-90-60
Revision date: 2015-05-28
Format: NA
Version 1



1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name Hydrogen Peroxide 90% HTP

Other means of identification

CAS-No 7722-84-1

Recommended use of the chemical and restrictions on use

Recommended Use: Monopropellant and bipropellant systems; fuel for rocket engines; rocket boosters / propellants / power source for aircraft; steam generation; rapid source of heat; electronics IC circuits and other military uses

Restrictions on Use: Use as recommended by the label.

Manufacturer/Supplier

PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: sdsinfo@peroxychem.com

PeroxyChem Canada
PG Pulp Mill Road
Prince George, BC V2N2S6
1+ 250/ 561-4200 (General Information)

Emergency telephone number

For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)
1 613/ 996-6666 (CANUTEC - Canada)
1 303/ 389-1409 (Medical - U.S. - Call Collect)

1 281 / 474-8750 (Bayport, Texas Plant)
1 250 / 561-4221 (Prince George, BC, Canada Plant)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Acute toxicity - Oral	Category 4
Acute toxicity - Inhalation (Vapors)	Category 4
Skin corrosion/irritation	Category 1 Sub-category A

Hydrogen Peroxide 90% HTP

SDS # : 7722-84-1-90-60

Revision date: 2015-05-28

Version 1

Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Oxidizing Liquids	Category 1

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Danger

Hazard Statements

H314 - Causes severe skin burns and eye damage

H302 - Harmful if swallowed

H332 - Harmful if inhaled

H335 - May cause respiratory irritation

H272 - May intensify fire; oxidizer



Precautionary Statements - Prevention

P271 - Use only outdoors or in a well-ventilated area

P260 - Do not breathe mist, vapours or spray.

P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

P283 - Wear fire/ flame resistant/ retardant clothing

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking

P220 - Keep/Store away from clothing/flammable materials/combustibles

P221 - Take any precaution to avoid mixing with combustibles/flammables

Precautionary Statements - Response

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P310 - Immediately call a POISON CENTER or doctor

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower

P306 + P360 - IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

P312 - Call a POISON CENTER or doctor if you feel unwell

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P310 - Immediately call a POISON CENTER or doctor

P370 + P378 - In case of fire: Use water for extinction

P371 + P380 + P375 - In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

Keep container in a cool place out of direct sunlight. Store only in vented containers. Do not store on wooden pallets. Do not return unused material to its original container. Avoid contamination - Contamination could cause decomposition and generation of oxygen which may result in high pressure and possible container rupture. Empty drums should be triple rinsed with water before discarding.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula HO - OH

Chemical name	CAS-No	Weight %
Hydrogen peroxide	7722-84-1	90
Water	7732-18-5	10

Occupational exposure limits, if available, are listed in section 8

4. FIRST AID MEASURES

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Seek immediate medical attention/advice.
Skin Contact	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
Inhalation	Move to fresh air. If person is not breathing, contact emergency medical services, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
Ingestion	Rinse mouth. Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	Hydrogen Peroxide irritates respiratory system and, if inhaled, may cause inflammation and pulmonary edema. The effects may not be immediate. In case of accidental ingestion, necrosis may result from mucous membrane burns (mouth, esophagus and stomach). Oxygen rapid release may cause stomach swelling and hemorrhaging, which may produce major, or even fatal, injury to organs if a large amount has been ingested. Corneal lesions and irreversible damage if contact with the eyes
Indication of immediate medical attention and special treatment needed, if necessary	Hydrogen peroxide at these concentrations 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.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Water. Do not use any other substance.
Specific Hazards Arising from the Chemical	In closed unventilated containers, risk of rupture due to the increased pressure from decomposition. Contact with combustible material may cause fire. Non-flammable but vapor phase decomposition occurs at 7.6 vol. % for 90% based on flash point.
Hazardous Combustion Products	A severe detonation hazard when mixed with organics. Contact with combustibles will cause fire. While not flammable by OSHA and DOT definitions, contamination, contact with incompatible materials, or high temperatures could cause a rapid decomposition that yields heat and oxygen, which support combustion and will cause a rapid overpressure if confined.
Explosion data	
Sensitivity to Mechanical Impact	Not sensitive.
Sensitivity to Static Discharge	Static discharge can potentially initiate decomposition in vapor mixtures.
Protective equipment and	Use water spray to cool fire exposed surfaces and protect personnel. Move containers from

precautions for firefighters

fire area if you can do it without risk. As in any fire, wear self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Isolate and post spill area. Keep people away from and upwind of spill/leak. Eliminate all sources of ignition and remove combustible materials.

Other

Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in fire.

Environmental Precautions

Prevent material from entering into soil, ditches, sewers, waterways, and/or groundwater. See Section 12, Ecological Information for more detailed information.

Methods for Containment

Dike to collect large liquid spills. Stop leak and contain spill if this can be done safely. Small spillage: Dilute with large quantities of water.

Methods for cleaning up

Flush area with flooding quantities of water. Hydrogen peroxide may be decomposed by adding sodium metabisulfite or sodium sulfite after diluting to about 5%.

7. HANDLING AND STORAGE

Handling

CONSULT PEROXYCHEM FOR APPROVED PERSONAL PROTECTIVE EQUIPMENT AND HANDLING AND STORAGE PROCEDURES. Wear chemical splash-type monogoggles and full face shield, Gortex®, polyester or acrylic full cover clothing and approved rubber or nitrile gloves and shoes. Do not use cotton, wool or leather for these materials react rapidly with hydrogen peroxide concentrations greater than 90%. Avoid contamination and heat as these will cause decomposition and generation of oxygen gas which will result in high pressures and possible container rupture. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner (contact Peroxychem for procedures). Never return unused hydrogen peroxide to original container. Empty aluminum drums should be returned to Peroxychem. Utensils used for handling hydrogen peroxide should be made only of clean glass, pre-approved passivated aluminum or stainless steel, or approved plastics such as polytetrafluoroethylene. Do not discard 90% or higher concentrations without first diluting to less than 5%.

Storage

Keep containers in cool areas out of direct sunlight and away from combustibles. Provide mechanical general and/or local exhaust ventilation to prevent release of vapor or mist into work environment. Containers must be vented. Keep/store only in original container. Store rooms or warehouses should be made of non-combustible materials with impermeable floors. In case of release, spillage should flow to safe area. Containers should be visually inspected on a regular basis to detect any abnormalities (swollen drums, increases in temperature, etc.).

Incompatible products

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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Ingredients with workplace control parameters.

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
Hydrogen peroxide 7722-84-1	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³	IDLH: 75 ppm TWA: 1 ppm TWA: 1.4 mg/m ³	Mexico: TWA 1 ppm Mexico: TWA 1.5 mg/m ³ Mexico: STEL 2 ppm

				Mexico: STEL 3 mg/m ³
Chemical name	British Columbia	Quebec	Ontario TWAEV	Alberta
Hydrogen peroxide 7722-84-1	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³

Appropriate engineering controls

Engineering measures Showers. Eyewash stations. Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/Face Protection Use chemical splash-type monogoggles and a full-face shield made of polycarbonate, acetate, polycarbonate/acetate, PETG or thermoplastic.

Skin and Body Protection For body protection wear impervious clothing such as an approved splash protective suit made of SBR rubber, PVC (PVC Outershell w/Polyester Substrate), Gore-Tex (Polyester trilaminate w/Gore-Tex), or a specialized HAZMAT Splash or Protective Suite (Level A, B, or C). DO NOT wear any form of splash suit or rainwear made of nylon or nylon-blends. For foot protection, wear approved boots made of NBR, PVC, Polyurethane, or neoprene. Overboots made of Latex or PVC, as well as firefighter boots or specialized HAZMAT boots are also permitted. DO NOT wear any form of boot or overboot made of nylon or nylon blends. DO NOT USE cotton, wool or leather as these materials react RAPIDLY with 90% or higher concentrations of hydrogen peroxide. Completely submerge hydrogen peroxide 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.

Hand Protection For hand protection, wear approved gloves made of nitrile, PVC, or neoprene. DO NOT use cotton, wool or leather for these materials react RAPIDLY with higher concentrations of hydrogen peroxide. Thoroughly rinse the outside of gloves with water prior to removal. Inspect regularly for leaks.

Respiratory Protection If concentrations in excess of 10 ppm are expected, use NIOSH/DHHS approved self-contained breathing apparatus (SCBA) or other approved air-supplied respirator (ASR) equipment (e.g., a full-face airline respirator (ALR)). DO NOT use any form of air-purifying respirator (APR) or filtering facepiece (dust mask), especially those containing oxidizable sorbants such as activated carbon.

Hygiene measures Avoid breathing vapors, mist or gas. Clean water should be available for washing in case of eye or skin contamination. .

General information Protective engineering solutions should be implemented and in use before personal protective equipment is considered.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear, colorless liquid
Physical State	Liquid
Color	Colorless
Odor	odorless
Odor threshold	Not applicable
pH	<= 1
Melting point/freezing point	-12 °C
Boiling Point/Range	141 °C
Flash point	Seta Closed Cup: (90%) 82 - 85°C. No visible flame observed. Reaction attributed to rapid decomposition.
Evaporation Rate	> 1 (n-butyl acetate=1)
Flammability (solid, gas)	Non-flammable but vapor phase decomposition occurs at 7.6 vol. % for 90 % based on flash point.
Flammability Limit in Air	Not applicable
Upper flammability limit:	

Lower flammability limit:	
Vapor pressure	5 mm Hg @ 30 °C
Vapor density	No information available
Density	1.39 g/cm ³ @ 20°C
Specific gravity	1.39
Water solubility	completely soluble
Solubility in other solvents	No information available
Partition coefficient	No data available
Autoignition temperature	ASTM E 659-78: 99% - 210°C (in air) 169°C (in oxygen). Reaction was attributed to rapid decomposition of vapors.
Decomposition temperature	740 °C
Viscosity, kinematic	1.15 cP @ 25 °C
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	Powerful oxidizer
Molecular weight	34
Bulk density	Not applicable

10. STABILITY AND REACTIVITY

Reactivity	Reactive and oxidizing agent.
Chemical Stability	Stable under normal conditions. Decomposes on heating. Stable under recommended storage conditions.
Possibility of Hazardous Reactions	A severe detonation hazard when mixed with organics. Contact with combustibles will cause fire. While not flammable by OSHA and DOT definitions, contamination, contact with incompatible materials, or high temperatures could cause a rapid decomposition that yields heat and oxygen, which support combustion and will cause a rapid overpressure if confined.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Excessive heat; Contamination; Exposure to UV-rays; pH variations.
Incompatible materials	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.
Hazardous Decomposition Products	Oxygen which supports combustion. Liable to produce overpressure in container.

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral	50% solution: LD50: > 225 mg/kg bw (rat) 35 % solution: LD50 1193 mg/kg bw (rat) 70 % solution: LD50 1026 mg/kg bw (rat)
LD50 Dermal	35% solution: LD50 > 2000 mg/kg bw (rabbit) 70 % solution: LD50 9200 mg/kg bw (rabbit)
LC50 Inhalation	50% solution: LC50 > 170 mg/m ³ (rat) (4-hr) Hydrogen Peroxide vapors: LC0 9400 mg/m ³ (mouse) (5 - 15 minutes) Hydrogen Peroxide vapors: LC50 > 2160 mg/m ³ (mouse)
Sensitization	Did not cause sensitization on laboratory animals.

Information on toxicological effects

Symptoms	Vapors, mists, or aerosols of hydrogen peroxide can cause upper airway irritation, inflammation of the nose, hoarseness, shortness of breath, and a sensation of burning or tightness in the chest. Prolonged exposure to concentrated vapor or to dilute solutions can
-----------------	---

cause irritation and temporary bleaching of skin and hair. Exposure to vapor, mist, or aerosol can cause stinging pain and tearing of eyes.

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

Carcinogenicity

This product contains hydrogen peroxide. 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).

Chemical name	ACGIH	IARC	NTP	OSHA
Hydrogen peroxide 7722-84-1	A3	3		

Mutagenicity

This product is not recognized as mutagenic by Research Agencies
In vivo tests did not show mutagenic effects

Reproductive toxicity

This product is not recognized as reprotox by Research Agencies.

**STOT - single exposure
STOT - repeated exposure**

May cause respiratory irritation.
Not classified.

Target organ effects

Eyes, Respiratory System, Skin.

Aspiration hazard

Aspiration risk: may cause lung damage if swallowed.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects

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.

Hydrogen peroxide (7722-84-1)				
Active Ingredient(s)	Duration	Species	Value	Units
Hydrogen peroxide	96 h LC50	Fish Pimephales promelas	16.4	mg/L
Hydrogen peroxide	72 h LC50	Fish Leuciscus idus	35	mg/L
Hydrogen peroxide	48 h EC50	Daphnia pulex	2.4	mg/L
Hydrogen peroxide	24 h EC50	Daphnia magna	7.7	mg/L
Hydrogen peroxide	72 h EC50	Algae Skeletonema costatum	1.38	mg/L
Hydrogen peroxide	21 d NOEC	Daphnia magna	0.63	mg/L

Persistence and degradability

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.

Bioaccumulation

Material may have some potential to bioaccumulate but will likely degrade in most environments before accumulation can occur.

Mobility

Will likely be mobile in the environment due to its water solubility but will likely degrade over time.

Other Adverse Effects

Decomposes into oxygen and water. No adverse effects.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods	Dispose of in accordance with local regulations. Can be disposed as waste water, when in compliance with local regulations.
US EPA Waste Number	D001 D002
Contaminated Packaging	Dispose of in accordance with local regulations. Drums - Empty as thoroughly as possible. Triple rinse drums before disposal. Avoid contamination; impurities accelerate decomposition. Never return product to original container.

14. TRANSPORT INFORMATION

DOT

UN/ID no	2015
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED
Hazard class	5.1 (Oxidizer)
Subsidiary class	8
Packing Group	I

TDG

UN/ID no	UN 2015
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED
Hazard class	5.1 (Oxidizer)
Subsidiary class	8
Packing Group	I

ICAO/IATA

Hydrogen peroxide (>40%) is forbidden on Passenger and Cargo Aircraft.

IMDG/IMO

UN/ID no	2015
Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED
Hazard class	5.1
Subsidiary Hazard Class	8
Packing Group	I

OTHER INFORMATION

Protect from physical damage. Keep drums in upright position. Drums should not be stacked in transit. Do not store drums on wooden pallets.

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic health hazard	No
Fire hazard	Yes
Sudden release of pressure hazard	No
Reactive Hazard	No

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Hydrogen Peroxide 90% HTP

SDS # : 7722-84-1-90-60

Revision date: 2015-05-28

Version 1

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	SARA RQ
Hydrogen peroxide 7722-84-1		1000 lb	

Hydrogen Peroxide RQ is for concentrations of > 52% only

International Inventories

Component	TSCA (United States)	DSL (Canada)	EINECS/EL INCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)	NZIoC (New Zealand)
Hydrogen peroxide 7722-84-1 (90)	X	X	X	X	X	X	X	X	X

Mexico - Grade

Serious risk, Grade 3

CANADA

WHMIS Hazard Class

C - Oxidizing materials
D1B - Toxic materials
E - Corrosive material
F - Dangerously reactive material



16. OTHER INFORMATION

NFPA	Health Hazards 3	Flammability 0	Stability 3	Special Hazards OX
HMIS	Health Hazards 3	Flammability 0	Physical hazard 3	Special precautions H

NFPA/HMIS Ratings Legend

Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Special Hazards: OX = Oxidizer

Protection = H (Safety goggles, gloves, apron, the use of supplied air or SCBA respirator is required in lieu of a vapor cartridge respirator)

Uniform Fire Code

Oxidizer: Class 3--Liquid

Revision date:

2015-05-28

Revision note

Initial Release

Disclaimer

PeroxyChem believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of PeroxyChem, PeroxyChem expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

Prepared By:

PeroxyChem

© 2015 PeroxyChem. All Rights Reserved.

End of Safety Data Sheet

Page 9 / 10

