SAFETY DATA SHEET

HYDROGEN PEROXIDE

CAS No.: 7722-84-1

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

HYDROGEN PEROXIDE
Hydroperoxide; Hydrogen Dioxide – supplied as an aqueous solution (commercial grades include 35%, 50% w/w and other strengths on request; physical/hazard data in this SDS reflect the 50% w/w grade)

CAS: 7722-84-1

Other means of identification

Formula: H_2O_2 | Molecular Weight: 34 g/mol

Recommended use of the chemical and restrictions on use

Relevant uses: Versatile chemical used across industries for bleaching (pulp/paper, textiles), chemical synthesis, environmental control/effluent treatment, and sterilisation. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
This mixture (aqueous solution, 50.0% w/w min.) is classified as Hazardous in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS):

Physical Hazard:

Hazard Class	Hazard Category	H-Statement
Oxidizing liquids	Category 2	H272 – May intensify fire; oxidizer

Health Hazard:

Hazard Class	Hazard Category	H-Statement
Skin Irritation	Category 2	H315 – Causes skin irritation
Acute Toxicity – Oral	Category 4	H302 – Harmful if swallowed
Acute Toxicity – Inhalation	Category 4	H332 – Harmful if inhaled
STOT – Single Exposure	Category 3	H335 – May cause respiratory irritation
Eye Damage	Category 1	H318 – Serious eye damage

Environmental Hazard:

Hazard Class	Hazard Category	H-Statement
Acute Aquatic Toxicity	Category 2	H401 – Toxic to aquatic life

GHS label elements, including precautionary statements

GHS: Danger

Name(s) on label – Hazardous component: Hydrogen Peroxide (50.0% w/w min)

Hazard statements

H272: May intensify fire, Oxidizer.
H315: Causes skin irritation.
H302: Harmful if swallowed.
H318: Serious eye damage.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.
H401: Toxic to aquatic life.

Precautionary statements

Prevention
P220: Keep/Store away from clothing/combustible materials.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
Response
P301+P312+P330+P331: IF SWALLOWED: Call a POISON CENTRE or doctor/physician. Rinse mouth. Do NOT induce vomiting.
P302+P353+P361: IF ON SKIN: Rinse skin with water/shower. Remove/take off immediately all contaminated clothing.
P304+P340+P312: IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTRE or doctor/physician if you feel unwell.
P305+P351+P338+P310: 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 CENTRE or doctor/physician.
P370+P378: In case of fire: Use water, use water spray for extinction.
Storage
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
Disposal
P501: Dispose of content by diluting with profuse water and in accordance with local/regional/national regulations.

Other hazards which do not result in classification or are not covered by the GHS

H412: Harmful to aquatic life with long-lasting effects (Chronic Aquatic Toxicity, Category 3).

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Not applicable – this product is a mixture (aqueous solution).

Mixtures

Chemical description: Hydrogen Peroxide, aqueous solution – CAS-No. 7722-84-1 – Concentration: 50.0% w/w min.

Substance Name	Hazard Class	Hazard Category	Route of Exposure	H-Phrases
Hydrogen Peroxide	Oxidizing liquid	Category 1	–	H271
	Acute Toxicity	Category 4	Inhalation	H332
	Acute Toxicity	Category 4	Oral	H302
	Skin corrosion	Category 1	–	H314
	STOT – Single exposure	Category 3	Inhalation	H335
	Acute aquatic toxicity	Category 2	–	H401
	Chronic aquatic toxicity	Category 3	–	H412

The hazard classification of the pure substance (component table above) is stricter than that of the 50% w/w aqueous solution supplied (Section 2), which is normal – dilution reduces the severity of the mixture's classification versus the neat substance. To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

4. FIRST AID MEASURES

Description of necessary measures for different routes of exposure

On inhalation
Remove to fresh air. If symptoms persist, call a physician.

In case of eye contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of difficulty opening the lids, administer an analgesic eye wash (oxybuprocaine). Consult an ophthalmologist immediately in all cases.

In case of skin contact
Remove and wash contaminated clothing before re-use. Wash off with plenty of water. Keep warm and in a quiet place. Consult a physician.

On ingestion
Call a physician immediately. Take the victim immediately to hospital. If the victim is conscious and swallowed the product, rinse mouth with water (only if conscious); do NOT induce vomiting. If the victim is unconscious but breathing, artificial respiration and/or oxygen may be necessary.

Most important symptoms/effects, acute and delayed

Inhalation
Corrosive to respiratory system. Symptoms: breathing difficulties, cough, pulmonary oedema, nausea, vomiting. Prolonged exposure: nose bleeding, chronic bronchitis.

Skin contact
Corrosive. Causes severe burns. Symptoms: redness, swelling of tissue.

Eye contact
Corrosive. Causes severe burns. Small amounts splashed into eyes can cause irreversible tissue damage and blindness. Symptoms: redness, lachrymation, swelling of tissue.

Ingestion
Severe burns to mouth and throat, danger of perforation of the oesophagus and stomach. Symptoms: nausea, abdominal pain, blood vomiting, suffocation, cough, severe shortness of breath. Risk of respiratory disorder.

Indication of immediate medical attention and special treatment needed, if necessary

Take the victim immediately to hospital. Consult with an ophthalmologist immediately in all cases. Burns must be treated by a physician. Keep under medical supervision for at least 48 hours.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water; water spray.
Unsuitable: None.

Specific hazards arising from the chemical

Oxygen released on thermal decomposition may support combustion. Contact with combustible material may cause fire. Contact with flammables may cause fire or explosions. Risk of explosion if heated under confinement.

Special protective actions for fire-fighters

Evacuate personnel to safe areas. In the event of fire, wear self-contained breathing apparatus. When intervening in close proximity, wear an acid-resistant over-suit. Clean contaminated surfaces thoroughly.

Additional provisions
Keep product and empty containers away from heat and ignition sources. Keep containers and surroundings cool with water spray. Approach from upwind. HAZCHEM Code: 2P.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Prevent further leakage or spillage if safe to do so. Keep away from incompatible products.

For emergency responders
Evacuate personnel to safe areas. Keep people away from the upwind spill/leak. Use personal protective equipment. In case of contact with combustible material, keep material wet with plenty of water.

Environmental precautions

Limited quantity: flush into sewer with plenty of water. Large quantities: if the product contaminates rivers, lakes or drains, inform the respective authorities.

Methods and materials for containment and cleaning up

Dam up. Soak up with inert absorbent material. Dilute with plenty of water. Do not add chemical products. Keep in suitable, closed and properly labelled containers for disposal. Never return spills to original containers for re-use.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use
Use only in well-ventilated areas. Keep away from heat and incompatible products. May not get in touch with organic materials. Use only equipment and materials compatible with the product.

B. Technical recommendations for the prevention of fires and explosions
Before all operations, passivate the piping circuits and vessels per the procedure recommended by the producer. Never return unused material to the storage receptacle. Do not confine the product in a circuit, between closed valves, or in a container without a vent.

C. Technical recommendations on general occupational hygiene
Use only in an area with adequate water supply. Containers and equipment used to handle the product should be used exclusively for that product.

D. Technical recommendations to prevent environmental risks
Information about special precautions needed for bulk handling is available on request from Suraj Chemicals.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage location	Shaded, well-ventilated place
Keep away from	Heat, direct sunlight, incompatible products, combustible material
Container	Store in original container equipped with a vent; keep closed; keep in a bunded area

B. General conditions for storage
Regularly check the condition and temperature of the containers. For additional information see subsection 10.5.

Packaging material

Aluminium 99.5%; Stainless steel 304L/316L; approved grades of HDPE.

Specific end use(s)

For further information, please contact Suraj Chemicals.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Identification	Occupational Exposure Limit Type	Value
Hydrogen Peroxide CAS: 7722-84-1	WEL – Time Weighted Average (8-hr)	1 ppm / 1.4 mg/m³
	WEL – Short-Term Exposure Limit	2 ppm / 2.8 mg/m³
	TLV (NOHSC) – Time Weighted Average (8-hr)	1 ppm / 1.4 mg/m³

Appropriate engineering controls

Ensure adequate ventilation. Apply technical measures to comply with the occupational exposure limits.

B. Respiratory protection

In case of emissions, use a face mask with type NO-P3 cartridge. Use self-contained breathing apparatus in medium confinement/insufficient oxygen, in case of large uncontrolled emissions, or whenever the mask and cartridge do not give adequate protection.

C. Specific protection for the hands

Protective gloves, impervious and chemical resistant. Suitable material: PVC, natural rubber, butyl-rubber, nitrile rubber.

D. Eye and face protection

Chemical-resistant goggles must be worn. Where splashes are likely: tightly fitting safety goggles and face-shield.

E. Bodily protection

Protective suit. Where splashes are likely: apron and boots. Suitable material: PVC, rubber products.

F. Additional emergency measures

Ensure safety showers are close to the workstation location. Eyewash bottle with pure water. Do not eat, drink or smoke when using.

Environmental exposure controls

Dispose of rinse water in accordance with local and national regulations.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties (50% w/w grade)

Appearance	
Physical state at 20°C	Liquid
Appearance	Liquid
Color	Colorless
Odor	Pungent
Odour threshold	Not available
Volatility	
Boiling point/range (H_2O_2 50%)	115°C
Vapour pressure @ 20°C / 30°C / 50°C	12 mbar / 1 mbar / 72 mbar (total pressure, H_2O_2+H_2O)
Evaporation rate	Not available
Product Description	
Relative density (H_2O_2 50%)	1.2
Bulk density	Not applicable
pH	< 2.0 (apparent pH)
Vapour density (H_2O_2 50%)	1
Partition coefficient n-octanol/water (log Pow)	–1.1
Solubility in water	Soluble – also soluble in polar organic solvents
Decomposition temperature	≥ 60°C (SADT); < 60°C slow decomposition
Melting point/freezing point (H_2O_2 50%)	–52°C
Flammability	
Flash Point	Product is not flammable
Flammability (solid, gas)	The product is not flammable
Autoignition temperature	Not applicable
Lower / Upper flammability limit	Not applicable

Other information

Explosive properties	Not explosive (with certain materials – see Section 10)
Oxidising properties	Yes
Viscosity @ 20°C (H_2O_2 50%)	1.17 mPa.s
Surface tension @ 20°C (H_2O_2 50%)	75.6 mN/m

10. STABILITY AND REACTIVITY

Reactivity

Potential for exothermic hazard. Decomposes on heating.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Contact with combustible material may cause fire. Contact with flammables may cause fire or explosions. Risk of explosion if heated under confinement. Fire or intense heat may cause violent rupture.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Do not overheat – avoid thermal decomposition	Keep away from direct sunlight	Avoid contamination

Incompatible materials

Acids, bases, metals, salts of metals, reducing agents, organic materials, flammable materials.

Hazardous decomposition products

Oxygen. Release of other hazardous decomposition products is possible if contaminated with incompatible material.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

A. Ingestion (acute effect)
Oral LD50, rat: > 225 & < 1200 mg/kg bw (H_2O_2 50%).

B. Inhalation (acute effect)
Inhalation LC50, 4h, rat: 2000 mg/m³ (Hydrogen Peroxide). Irritation (other route): inhalation, mouse, irritating to respiratory system, RD50 = 665 mg/m³.

C. Contact with skin and eyes (acute effect)
Dermal LD50, rabbit: > 2000 mg/kg, corrosive (H_2O_2 50%). Skin irritation (rabbit): corrosive effect (H_2O_2 50%). Eye irritation: risk of serious damage to eyes (H_2O_2 50%).

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)
Carcinogenicity – oral, prolonged exposure, mouse: target organ duodenum, carcinogenic effects observed; dermal, prolonged exposure, mouse: animal testing did not show carcinogenic effects. Reproductive toxicity: substance is totally biotransformed (metabolised); study considered scientifically unjustified.

E. Sensitizing effects
Guinea pig: did not cause sensitization in laboratory animal testing.

F. Specific target organ toxicity (STOT) – single exposure
Inhalation, mice, 665 mg/m³ (RD50) – irritating to respiratory system.

G. Specific target organ toxicity (STOT) – repeated exposure
Oral, 90-day, mouse: target organ gastrointestinal tract, 300 ppm LOAEL / 100 ppm NOAEL (pure substance). Inhalation, 28-day, rat: target organ respiratory system, 10 ppm LOAEL (vapour) / 2 ppm NOAEL (vapour), pure substance. Chronic toxicity – oral, prolonged exposure, various species: target organs gastrointestinal tract; inhalation, repeated exposure, dog: LOEL 14.6 mg/m³, irritant effects.

H. Aspiration hazard
No data available.

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Hydrogen Peroxide CAS: 7722-84-1	LD50 oral: >225 & <1200 mg/kg bw (H_2O_2 50%)	Rat
	LD50 dermal: > 2000 mg/kg, corrosive (H_2O_2 50%)	Rabbit
	LC50 inhalation (4h): 2000 mg/m³	Rat

12. ECOLOGICAL INFORMATION

Toxic to aquatic life. Harmful to aquatic life with long-lasting effects.

Toxicity

Acute Toxicity	Species	Genus
LC50: 16.4 mg/L (96h); NOEC: 5 mg/L (96h)	Pimephales promelas	Fish
EC50: 2.4 mg/L (48h); NOEC: 1 mg/L (48h)	–	Crustacean

Chronic toxicity

Chronic Toxicity	Species	Genus
NOEC: 2 mg/L (56 days)	–	Molluscs
EC50 (growth rate): 4.3 mg/L (72h); NOEC: 0.1 mg/L (72h)	Chlorella vulgaris	Algae

Persistence and degradability
Abiotic degradation: air (indirect photo-oxidation) t½ 16–20h; water (redox reaction) t½ 25–100h (fresh water), 50–70h (salt water); soil (redox reaction) t½ 0.05–15h. Biodegradation: readily biodegradable (aerobic, biological treatment sludge t½ < 2 min; fresh water t½ 0.3–5 days; soil t½ < 12 hrs); anaerobic/soil-sediment: not applicable.

Bioaccumulative potential
Does not bioaccumulate.

Mobility in soil

Air	Water	Soil/Sediments
Henry's law constant (H) = 1 Pa.m³/mol @ 20°C – volatility not significant	Considerable solubility and mobility; product evaporates slowly	Non-significant evaporation and adsorption

Results of PBT and vPvB assessment
No data available.

Other adverse effects
No data available.

13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues/unused products: dilute with plenty of water and flush into sewer with plenty of water for limited quantities; for large quantities, contact the manufacturer/supplier; in all cases dispose in accordance with local and national regulations.

Contaminated packaging: clean empty containers with water; dispose of rinse water in accordance with local and national regulations; do not rinse dedicated containers; empty, clean containers may be reused in conformity with regulations.

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023)

14.1 UN number	UN2014
14.2 UN proper shipping name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
14.3 Transport hazard class(es)	5.1 (Labels: 5.1, 8)
14.4 Packing group	II
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9. HAZCHEM Code: 2P
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22)

14.1 UN number	UN2014
14.2 UN proper shipping name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
14.3 Transport hazard class(es)	5.1 (Sub-risk: 8)
14.4 Packing group	II
14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Number: F-H, S-Q. Labels: 5.1 – Oxidizing substance, 8 – Corrosive
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024)

14.1 UN number	UN2014
14.2 UN proper shipping name	Not permitted to transport by air at this concentration
14.3 Transport hazard class(es)	Not permitted to transport
14.4 Packing group	Not permitted to transport
14.5 Environmental hazard	–
14.6 Special precautions for user	IATA: forbidden for air transport over 40% w/w concentration – this 50% w/w grade is not permitted as cargo or passenger aircraft freight
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

15. REGULATORY INFORMATION

Label

Hazardous components which must be listed on the label: Hydrogen Peroxide. Classified as hazardous per applicable national occupational health & safety criteria.

Legacy (pre-GHS) classification, for reference

Symbol: C – Corrosive
R-phrase(s): R8 – Contact with combustible material may cause fire; R34 – Causes burns.
S-phrase(s): S1/2 – Keep locked up and out of the reach of children; S3 – Keep in a cool place; S28 – After contact with skin, wash immediately with plenty of water; S36/39 – Wear suitable protective clothing and eye/face protection; S45 – In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Other information

The percentage concentration of the solution must be indicated next to the product name on any re-labelled package.

16. OTHER INFORMATION

Text of phrases mentioned

WEL: Workplace Exposure Limit.
TWA: Time Weighted Average.
STEL: Short Term Exposure Limit.
NOHSC: National Occupational Health and Safety Commission (reference standard cited in source data).
H271: May cause fire or explosion; strong oxidizer.
H272: May intensify fire; oxidizer.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H315: Causes skin irritation.
H318: Causes serious eye damage.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.
H401: Toxic to aquatic life.
H412: Harmful to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

NFPA (National Fire Protection Association) Classification

Health	Flammability	Instability/Reactivity	Special Notices
3 – Serious	0 – Minimal	1 – Slight	OX – Oxidizer

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

Manufacturer's Safety Data Sheet for Hydrogen Peroxide (50% w/w Grade-3), prepared per GHS/EC No.1272/2008 classification framework and BIS standard IS 2080:2021.

Abbreviations and acronyms

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | EmS: Emergency Schedule | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | NOEC: No Observed Effect Concentration | LOEL/LOAEL: Lowest Observed (Adverse) Effect Level | NOAEL: No Observed Adverse Effect Level | SADT: Self-Accelerating Decomposition Temperature | Log Pow: Octanol-water partition coefficient

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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