Material Safety Data Sheet

Hydrogen Peroxide 35%

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1. Product and Company Identification

a) Product Name

Hydrogen Peroxide 35%

b) Recommended use of the chemical and restrictions on use

- Paper & Pulp Bleaching
- Semiconductor
- Reagent

c) Manufacturer / Supplier / Distributor Information

Name : Cosmo Chemistry

Address :
Office No. 713, Millennium Business Hub, Surat, Gujarat, India – 395006

Emergency Phone Number :
+91 97979 77958

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2. Hazards Identification

a) Hazard • Risk Classification

- Oxidizing Liquids – Category 2
- Acute Toxicity (Oral) – Category 4
- Acute Toxicity (Inhalation) – Category 4
- Serious Eye Damage / Eye Irritation – Category 1
- Skin Corrosion / Irritation – Category 1
- Carcinogenicity – Category 2
- Specific Target Organ Toxicity (Single Exposure) – Category 1 (Lung)
- Specific Target Organ Toxicity (Repeated Exposure) – Category 1 (Lung), Category 2 (Blood)
- Hazardous to Aquatic Environment (Chronic) – Category 3

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b) Label Elements Including Precautionary Statements

Symbol

(Oxidizer, Corrosive, Health Hazard, Exclamation Mark)

Signal Word

Danger

Hazard • Risk Statement

Code Statement

H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Cause severe skin burns and eye damage.

H318 Cause serious eye damage.

H332 Harmful if inhaled.

H351 Suspected of causing cancer.

H370 Cause damage to organs (lung).

H372 Causes damage to organs (lung, blood) through prolonged or repeated exposure.

H412 Harmful to aquatic life with long lasting effects.

Precautionary Statement

Prevention

P201 : Obtain special instructions before use.

P202 : Do not handle until all safety precautions have been read and understood.

P210 : Keep away from heat/spark/open flames/hot surface – No Smoking.

P220 : Keep / Store away from combustible materials.

P221 : Take any precaution to avoid mixing with combustibles.

P260 : Do not breathe dust/fume/gas/mist/vapours/spray.

P261 : Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 : Wash thoroughly after handling.

P270 : Do not eat, drink or smoke when using this product.

P271 : Use only outdoors or in a well ventilated area.

P273 : Avoid release to the environment.

P280 : Wear protective gloves/protective clothing/eye protection/face protection.

Response

P301 + P312 + P330 + P331 :
If swallowed or feel unwell, rinse mouth.
Do not induce vomiting and call a doctor.

P303 + P361 + P353 :
If on skin, remove/take off immediately all contaminated clothing.
Rinse skin with water/shower.

P304 + P340 :
If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 :
If in eyes, rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do.
Continue rinsing.

P308 + P311 + P313 :
If exposed or concerned, call a poison center or doctor/physician and get medical advice/attention.

P310 :
Immediately call doctor.

P314 :
Get medical advice/attention if you feel unwell.

P321 :
Specific treatment reference to supplement first aid instruction.

P363 :
Wash contaminated clothing before reuse.

P370 + P378 :
In case of fire, use extinguishing media with H_2O or extinguisher for extinction.

Storage

P405 :
Store locked up.

Disposal

P501 :
Dispose of contents in accordance with local/regional/national/international regulations.

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c) Other Hazard • Risk Which Are Not Included in the Classification Criteria

NFPA Rating

Item	Rating
Health	3
Fire	0
Reactivity	1

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3. Composition / Information on Ingredients

Chemical Name	Other Name	CAS Number or Other Identification Number	Content (%)
Hydrogen Peroxide	Hydrogen dioxide	7722-84-1	35%
Water	Dihydrogen oxide	7732-18-5	65%

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4. First Aid Measures

a) Eye Contact

Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (**at least 15–20 minutes**).

Continue irrigating with normal saline until the **pH has returned to normal (30–60 minutes).**

Cover with sterile bandages.

Get medical attention immediately.

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b) Skin Contact

Remove contaminated clothing, shoes, etc. immediately.

Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (**at least 15–20 minutes**).

If burns occur, proceed with the following:

Cover affected area securely with **sterile, dry, loose-fitting dressing.**

Treat symptomatically and supportively.

Get medical attention immediately.

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c) Inhalation

Perform artificial respiration if necessary.

Maintain airway, blood pressure and respiration.

Keep warm and at rest.

Treat symptomatically and supportively.

Get medical attention immediately.

Qualified medical personnel should consider administering oxygen.

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d) Ingestion

If the person is conscious and not convulsing, give **2–4 glasses of water** to dilute the chemical.

Use gastric tube to relieve the pressure caused by evolved oxygen.

(Dreisbach, Handbook of Poisoning, 12th Ed.)

Treat symptomatically and supportively.

Intubation should be performed by qualified medical personnel.

Get medical attention immediately.

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e) Indication of Immediate Medical Attention and Notes for Physician

Move victim to fresh air.

Call **911** or emergency medical service.

Give artificial respiration if victim is not breathing.

Administer oxygen if breathing is difficult.

Remove and isolate contaminated clothing and shoes.

Contaminated clothing may be a fire risk when dry.

In case of contact with substance, immediately flush skin or eyes with running water for **at least 20 minutes.**

Keep victim warm and quiet.

Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

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5. Fire-Fighting Measures

a) Suitable (and Unsuitable) Extinguishing Media

Small Fire

Use **water.**

Do **not** use dry chemicals or foams.

CO_2 or Halon may provide limited control.

Large Fire

Flood fire area with water from a distance.

Do not move cargo or vehicle if cargo has been exposed to heat.

Move containers from fire area if you can do it without risk.

Fire Involving Tanks or Car/Trailer Loads

Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

Cool containers with flooding quantities of water until well after fire is out.

Always stay away from tanks engulfed in fire.

For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible,

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b) Specific Hazards Arising From the Chemical

These substances will accelerate burning when involved in a fire.

Some may decompose explosively when heated or involved in a fire.

May explode from heat or contamination.

Some will react explosively with hydrocarbons (fuels).

May ignite combustibles (**wood, paper, oil, clothing, etc.**).

Containers may explode when heated.

Inhalation, ingestion or contact (**skin, eyes**) with vapors or substance may cause severe injury, burns or death.

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

Runoff may create fire or explosion hazard.

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c) Special Protective Equipment and Precautions for Fire-Fighters

Wear positive pressure **self-contained breathing apparatus (SCBA).**

Wear chemical protective clothing that is specifically recommended by the manufacturer.

It may provide little or no thermal protection.

Structural firefighters' protective clothing will only provide limited protection.

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6. Accidental Release Measures

a) Personal Precautions, Protective Equipment and Emergency Procedures

Keep combustibles (**wood, paper, oil, etc.**) away from spilled material.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Stop leak if you can do it without risk.

Do not get water inside containers.

Isolate area.

Approach from upwind.

Avoid materials and products which are incompatible with the product (**see Section 10**).

In case of contact with combustible materials, avoid product drying out by dilution with water.

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b) Environmental Precautions and Protective Procedures

Atmosphere: –

Land: If possible, dam large quantities of liquid with sand or earth.

Underwater: Prevent entry into waterways, sewers, basements or confined areas.

c) Methods and Materials for Containment and Cleaning Up

Dilute with large quantities of water.

Do not add chemical products.

For disposal methods, refer to **Section 13**.

In order to avoid the risk of contamination, the recovered product must **not** be returned to the original tank/container.

Small Liquid Spill

Use a non-combustible material like **vermiculite or sand** to soak up the product and place into a container for later disposal.

Large Spill

Dike far ahead of liquid spill for later disposal.

Following product recovery, flush area with water.

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7. Handling and Storage

a) Precautions for Safe Handling

Do not get water inside container.

Isolate hazard area and deny entry.

Operate in a well-ventilated area.

Prevent all contact with organics.

Use equipment and containers which are compatible with the substances.

Container and equipment used to handle hydrogen peroxide should be used exclusively for hydrogen peroxide.

b) Conditions for Safe Storage

Avoid impurities and heat effect.

Keep away from incompatible products.

Before all operations, passivate the piping circuits and vessels.

Never return unused product to storage container.

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8. Exposure Controls & Personal Protection

a) Control Parameters

- **CEFIC**
  - TWA (8 hours) – **1 ppm (1.4 mg/m³)**
  - STEL (5–15 min) – **3 mg/m³**
- **ACGIH**
  - TWA – **1 ppm (1.4 mg/m³)**
- **NIOSH**
  - TWA – **1 ppm (1.4 mg/m³)**
- **DFG**
  - MAK – **1.4 mg/m³**

Definitions

- **TWA** : Time Weighted Average
- **ACGIH** : United States American Conference of Governmental Industrial Hygienists

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b) Appropriate Engineering Controls

Operate in a well-ventilated area.

Provide local exhaust or process enclosure ventilation to meet published exposure limits.

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c) Personal Protective Equipment

Wear personal protective equipment in accordance with **Chemical Control Act Article 14, Regulation about wearing personal protective equipment of hazardous handler.**

Respiratory Protection

Wear a respirator more than **full facepiece respirator for organic compound** (**more than 35 wt%**).

Eye Protection

Employee must wear splash-proof or dust-resistant safety goggles and a face shield to prevent contact with this substance.

Hands Protection

Employee must wear appropriate protective gloves to prevent contact with this substance.

Wear safety gloves for chemical material (**more than 35 wt%**).

Body Protection

Wear **3 or 4 form protective clothing** for chemical materials (**more than 35 wt%**).

Employee must wear appropriate protective (impervious) clothing and equipment to prevent any possibility of skin contact with this substance.

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9. Physical and Chemical Properties

Property	**Value**
Appearance (physical state, color etc.)	Colorless liquid, slightly pungent
Odor	Not available
Odor threshold	Not available
pH	pKa = 11.62 (25℃) (100% pure H_2O_2), pH < 3.5
Melting point / freezing point	-33 ℃
Initial boiling point and boiling range	108 ℃
Flash point	Not applicable (non combustibility)
Evaporation rate	Not available
Flammability (solid, gas)	Not applicable (non combustibility)
Upper / lower flammability or explosive limits	Not applicable (non combustibility)
Vapor pressure	0.48 hPa (30℃, partial)
Solubility	Miscible in all proportions
Vapor density	1 (air = 1)
Relative density	1.115 ~ 1.155 (15℃)

Property	Value
Partition coefficient	-1.5 (estimated)
Auto-ignition temperature	Not available
Decomposition temperature	150~152 ℃ decomposition (100% pure H_2O_2)
Viscosity	1.11 cP (20℃)
Molecular mass	34.01

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10. Stability and Reactivity

a) Chemical Stability and Possibility of Hazardous Reactions

May decompose on prolonged storage or heating with evolution of oxygen.

Tightly closed containers may rupture due to an increase in internal pressure.

Thermal decomposition becomes self-sustaining at **141℃** and is accelerated by agitation, contact with rough surfaces, alkalies, finely divided metals and many other substances.

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b) Conditions to Avoid (e.g. static discharge, shock or vibration, etc.)

May ignite other combustible materials (**wood, paper, oil, etc.**).

Reaction with fuels may be violent.

Flammable poisonous gases may accumulate in tanks and hopper cars.

Runoff to sewer may create fire or explosion hazard.

c) Incompatible Materials

- Acids
- Bases
- Metals
- Salts of metals
- Reducing agents
- Organic materials
- Flammable substances

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d) Hazardous Decomposition Products

Thermal decomposition releases oxygen and heat.

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11. Toxicological Information

a) Information on the Likely Routes of Exposure

Inhalation

May cause nasal discharge, oedematous feet, irritation of skin in the groin, hair loss.

Oral

May cause burning sensation in the throat, epigastrium and substernal area and vomited.

Skin Contact

May cause moderate irritation combined with delayed epidermal necrosis and sloughing.

Eye Contact

May irreversible corneal injury (corrosion), severe iritis and severe conjunctivitis.

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b) Health Hazards Information

Acute Toxic

Oral

- Category 4, Regulation about classification and labeling of chemical material.
- **LD50 : 1,193 mg/kg Rat (GLP, US EPA Guidelines)**

Dermal

- Not classified.
- **LD50 > 2,000 mg/kg Rabbit (OECD TG402, GLP)**

Inhalation

- Category 4, Regulation about classification and labeling of chemical material.

Skin Corrosive / Irritant

Category 1

Regarding a study (**35% H_2O_2, New Zealand White rabbits, treated with 0.5 ml for 4 hr**), slight to moderate erythema, oedema and/or brown areas in the application sites.

Thus, the finding revealed moderate irritation combined with delayed epidermal necrosis and sloughing.

Serious Eye Damage / Eye Irritation

Category 1

The test study (**10 and 12% H_2O_2, rabbits**) showed severe, penetrating, irreversible corneal injury (corrosion), severe iritis and severe conjunctivitis in rabbit eyes (**FHSA method**).

In other test, it was observed highly irritating with slight corneal opacities, iritis and severe conjunctivitis on unwashed eyes, but severe corneal opacities, severe iritis and conjunctivitis on washed eyes.

Respiratory Sensitization

Not available.

Skin Sensitization

Not classified.

3% H_2O_2 preparations were studied and appeared **not to sensitise** guinea pigs using a modification of the **Magnusson-Kligman procedure**.

Also, some case studies in humans showed all negative results.

Carcinogenicity

Category 2

- IARC Group 3
- ACGIH A3
- NTP
- OSHA : Not classified

Germ Cell Mutagenicity

Not classified

In vitro

1. Gene mutation assays (**Ames test**) : Positive
2. Bacterial DNA damage and repair : Positive
3. Mammalian cell gene mutation assays : Positive
4. Sister chromatid exchange : Positive
5. Cytogenetic assays : Positive

In vivo

1. Genetic toxicity : Negative

- Rat (**Wistar, male**) hepatocyte unscheduled DNA synthesis (**UDS**)
- Mouse (**Swiss HIM/OF1**) micronucleus assay of bone marrow polychromatic erythrocytes

- *Drosophila melanogaster* SLRL test

Reproductive Toxicity

Not classified.

The study (**mice and rats, exposed by drinking water**) showed that there is the effect to sperm motility, the effect to estrous cycle of female, the effect to the decrease of the number of delivery maternal animal, and the weight decrease of offspring.

But it was presumed that because of the rapid degradation of the substance on absorption and due to local effects, studies would be unlikely to reveal any specific developmental effects.

Specific Target Organ Toxicity (Single Exposure)

Category 1 (Lung)

Animal congestion, pulmonary edema, emphysema, epidermal necrolysis of lung and organs.

Specific Target Organ Toxicity (Repeated Exposure)

Category 1 (Lung)

Category 2 (Blood)

Human both **FEV1** and **FVC** decreased by about **15%** in the exposed group.

Animal effects on a range of other parameters including:

- Decreased red blood cell count
- Haemocrit
- Plasma protein concentration
- Plasma catalase

Aspiration Hazard

Not available.

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12. Ecological Information

a) Aquatic and Terrestrial Ecotoxicity

Fish

ECHA **LC50 = 16.4 mg/L**

96 hr

Pimephales promelas

(USEPA method)

Crustacea

ECHA **LC50 = 2.4 mg/L**

48 hr

Daphnia pulex

(USEPA method)

Algae

ECHA **ErC50 = 1.38 mg/L**

72 hr

Skeletonema costatum

(Paris Commission Guidelines 1990, GLP)

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b) Persistence and Degradability

Persistence

log Kow = -1.5 (estimated)

Degradability

Photolysis in air:

Half-life of 24 hours

Photolysis in water is **not expected**.

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c) Bioaccumulative Potential

Biodegradation

Readily biodegradable.

Hydrogen peroxide is biologically degradable.

Aerobic bacteria produce catalase enzymes that convert **H_2O_2 to water and oxygen**.

Catalase is present in most aerobic bacteria and therefore biological degradation starts readily when H_2O_2 is in contact with microbial material.

Bioaccumulation

Low potency of bioaccumulation.

BCF = 1.4 (fish), 3.3 (earthworm)

d) Mobility in Soil

Low potency of mobility to soil.

log Koc = 0.2

(Mackay Model 1, TGD, QSAR for nonhydrophobics)

e) Other Adverse Effects

Not available.

13. Disposal Considerations

a) Disposal Method

Disposal must be in accordance with standards applicable to generators of hazardous waste,

40 CFR 262.

EPA Hazardous Waste Number: D002

100 pound CERCLA Section 103 Reportable Quantity.

b) Disposal Precaution

Observe all federal, state and local regulations when disposing of this substance.

14. Transport Information

a) UN Number

2014

b) UN Proper Shipping Name

HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)

c) Transport Hazard Class

5.1 (Subsidiary 8)

d) Packing Group (if applicable)

II

e) Marine Pollution

Not applicable

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f) Special Precaution Which a User Should Be Aware of or Needs to Comply With in Connection With Transport or Conveyance Either Within or Outside Their Premises

Emergency Schedule for Fire: F-H

Emergency Schedule for Spillage: S-Q

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15. Regulatory Information

a) Industrial Safety and Health Act

Listed in:

- Occupational exposure assessment
- Hazardous agent
- Occupational exposure limits
- Health examination agent

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b) Chemical Control Act

- Regulation about wearing personal protective equipment of hazardous handler
- Regulation about classification and labeling of chemical material
- Hazard classification
- Specifying hazardous substances, restricted substances, prohibited substances

Mark 1

"more than 6 wt%, toxic"

Enforcement Regulations Mark 10

"more than 35 wt%, accident preparedness substances"

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c) Dangerous Material Safety Control Act

Enforcement Ordinance Mark 1 Note 22

"more than 36 wt%, dangerous"

Oxidizing liquids:

600 kg

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d) Wastes Management Act

Designated waste

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e) Other Requirements in Domestic and Other Countries

Domestic Requirements

Persistent Organic Pollutants Control Act

Not applicable

Other Countries Requirements

EU Classification

Classification

- R5 O
- R8
- C
- R35
- Xn
- R20/22

EU Risk Phrases

- R5
- R8
- R20/22
- R35

EU Safety Phrases

- S1/2
- S17
- S26
- S28
- S36/37/39
- S45

U.S.A. Management Information

Item	Status
TSCA Inventory	Y
CERCLA Section 103 (40 CFR 302.4)	N
SARA Section 302 (40 CFR 355.30)	Y, TPQ – 1000 lb
SARA Section 304 (40 CFR 355.40)	Y, RQ – 1 lb
SARA Section 313 (40 CFR 372.65)	N
OSHA Process Safety (29 CFR 1910.119)	More than 52%, TQ = 7500 lb
California Proposition 65	N

SARA Hazard Categories

SARA Sections 311/312 (40 CFR 370.21)

Hazard Type	Status
Acute Hazard	Y
Fire Hazard	Y
Reactivity Hazard	Y
Chronic Hazard	N
Sudden Release Hazard	N

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16. Other Information

a) Information Source and References

- ECB : ESIS (European Chemical Substances Information System)
- European Union Risk Assessment Report (RAR)
- IARC. *Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man*
- Geneva – World Health Organization, International Agency for Research on Cancer, 1972–Present (Multivolume work), p. S7 216 (1987)
- **REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 16 December 2008
- OECD SIDS: (http://www.chem.unep.ch/irptc/sids/OECDSIDS/Naco.pdf)
- Korea Occupational Health & Safety Agency
- National Chemicals Information Systems

- U.S. National Library of Medicine (NLM) Hazardous Substances Data Bank (HSDB):
  - http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.htm
- Incorporated Administrative Agency National Institute of Technology and Evaluation:
  - http://www.safe.nite.go.jp/japan/sougou/data/pdf/hazard/hyokasyo/No-32.pdf

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b) Issuing Date

2010. 06. 18

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c) Revision Number and Date

Revision Number: 10

Revision Date: 2024. 01. 09

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d) Others

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