Material Safety Data Sheet

HYDROGEN PEROXIDE 35%

1. PRODUCT AND COMPANY IDENTIFICATION

Product Information

Product name	HYDROGEN PEROXIDE 35wt%
Chemical name	HYDROGEN PEROXIDE aqueous solution
Product use	Used in bleaching textiles, paper, wood, rattan, and other material; used in the manufacture of a wide range of chemicals, plastics, cosmetics, etc; used in photography, electroplating, water treatment and wastewater treatment

Company

Name	**PT. Peroksida Indonesia Pratama**
Address	Head Office: Graha Purna Bhakti Building, Jl. Jend. A. Yani No. 39, PO BOX 53, Cikampek 41373, West Java, Indonesia
Customer Service Telephone Number	(62) 264-313383, 264-313387, 264-318577 (Monday to Friday, 7.00 AM to 4.00 PM)
Customer Service Facsimile Number	(62) 264-313386 (Monday to Friday, 7.00 AM to 4.00 PM)
Emergency Call	(62) 264-313383, 264-313387, 264-318577 (Monday to Friday, 7.00 AM to 4.00 PM) Please call the nearest fire department and hospital for spill, leak, fire, and accident involving chemical. Within Indonesia area, call 113 for fire department and 118/ 119 for medic (24 hrs. 7 days a week)

2. HAZARDS IDENTIFICATION

GHS Classification

Physical Hazards	
Explosives	Not classified
Flammable gasses	Not applicable
Flammable aerosols	Not applicable
Oxidizing gases	Not applicable
Gases under pressure	Not applicable
Flammable liquids	Not classified
Flammable solids	Not applicable
Self-reactive substances and mixtures	Not classified
Pyrophoric liquids	Not classified
Pyrophoric solids	Not applicable
Self-heating substances and mixtures	Not classified
Substances & mixtures which in contact with water emit flammable gases	Not applicable
Oxidizing liquids	Category 2
Oxidizing solids	Not applicable
Organic peroxides	Not applicable
Corrosive to metals	Classification not possible
Health Hazards	
Acute toxicity - oral	Category 4
Acute toxicity - dermal	Not classified
Acute toxicity - inhalation: gas	Not applicable
Acute toxicity - inhalation: vapor	Category 4
Acute toxicity - inhalation: dust	Not applicable

Acute toxicity - inhalation: mist	Classification not possible
Skin corrosion/ irritation	Category 1A – 1C
Serious eye damage/ eye irritation	Category 1
Respiratory sensitization	Classification not possible
Skin sensitization	Classification not possible
Germ cell mutagenity	Not applicable
Carcinogenicity	Not applicable
Reproductive toxicity	Category 2
Specific target organ toxicity – single exposure	Category 1 (respiratory system, central nervous system)
Specific target organ toxicity – repeated exposure	Category 1 (lungs), Category 2 (blood)
Aspiration hazard	Classification not possible

Environmental Hazards

Acute hazards to aquatic environment	Category 2
Cronic hazards to aquatic environment	Not applicable

GHS Labelling

Symbols/ Pictograms

Signal Word Danger

Hazard Statements

May intensify fire: oxidizer
Harmful if swallowed
Harmful if inhaled
Causes severe skin burns
Causes severe eye damage
Causes damage to respiratory organs, central nervous system
Suspected of damaging fertility or the unborn child
Causes damage to lungs through prolonged or repeated exposure
May cause damage to blood through prolonged or repeated exposure
Toxic to aquatic life

Precautionary Statements

Do not handle until all the safety precautions in this MSDS have been read and understood.

Prevention

- Do not breathe vapors/ mist.
- Wear protective gloves/ protective clothing/ eye protection/ face protection.
- Avoid foreign substances such as alkali, heavy metal, organic matter and garbage to get mixed.
- Once this product has been taken out of its container, it must not be restored in the original one.

Response

- If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice.
- If swallowed: Have the victim ingest water, etc. immediately and get medical advice.
- If in eye: Immediately rinse cautiously with enough water at least 15 minutes. (Remove contact lenses, if present and easy to do. Continue rinsing.) Get medical advice.
- If on skin or clothing: Immediately take off all contaminated clothing to rinse the skin with running water.
- Wash contaminated combustibles such as wood, cloth, and paper thoroughly with water.

Storage

- Store away from combustibles.
- Keep container tightly closed with a tap used exclusively for the container.
- Avoid sunlight and store locked up in a cool and well-ventilated place.

Disposal

Decompose unnecessary hydrogen peroxide by reacting gradually with a reducing agent such as sodium sulfite or with metals, etc. after diluting thoroughly with plenty of water. Ask us for further details.

Other hazards which do not result in GHS classification
When a foreign substance gets mixed, oxygen gas and heat are generated and may lead to damage of the container and scattering of hydrogen peroxide.

3. COMPOSITION/ INFORMATION OF INGREDIENTS

Substances vs mixture	Single chemical
Chemical/ generic name	Hydrogen peroxide
Synonym	Hydrogen peroxide solution
Chemical property (chemical formula, etc.)	H_2O_2
CAS number	7722-84-1
Concentration	35wt% solution
Gazette Reference Number:	
CSCL	(1)-419
ISHL	Published
TSCA	Registered
EINECS Number	231-765-0
DSL (NDSL)	Registered
AICS	Registered
Korean ECL Number	KE-20204
Philippine Registration	Registered
Chinese (IECSC) Registration	Registered

4. FIRST AID MEASURES

If inhale	Immediately remove victim to fresh air. Get medical advice.
If on skin	When clothing, shoes, etc. are contaminated, remove them immediately to rinse the skin thoroughly with running water. Get medical advice according to symptoms.
If in eye	Immediately wash the face with running water at least 15 minutes. Get medical advice from a doctor (eye specialist). Delayed or insufficient rinsing may cause eye disorders.
If swallowed	Have the victim ingest water or milk and immediately get medical advice. If the victim is unconscious, do not give anything into the mouth.

Most Serious Symptoms/ Effects
White spots with stabbing pains appear on the outer layer of the contaminated skin.

Protection of First-aiders
First-aiders should wear protective equipment such as rubber gloves, goggles to prevent the contact with this product.

Specific Precautions for Physicians
If this product gets in an eye, a symptom may appear after some time has passed even though an abnormal sensation is not felt soon.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media
Use water for general fire; however, use extinguishing media such as foam, powder, and carbon dioxide when plenty of organic solvents or oils are mixed.

Unsuitable Extinguishing Media
Water when plenty of organic solvents or oils are mixed.

Specific Hazards
Hydrogen peroxide itself will not burn. However, special attention is required because oxygen gas liberated due to decomposition supports combustion of combustibles in the immediate vicinity to intensify fire. (Oxidizing)

Specific Fire Fighting Measures
Remove containers containing hydrogen peroxide in the immediate vicinity quickly to a safe place. If containers cannot be removed, cool them by spraying water.

Protective Actions for Fire Fighters
- For fighting fire, wear protective equipment and start to work on the windward side. If there is a risk of inhaling vapors and mist of this product, wear respiratory protection such as air breathing apparatus.
- Shielding yourself, apply water from a safe distance. Try unmanned fire-fighting with deluge guns, etc.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Depending on the situation, keep personnel away from leakage by roping off the area. For taking measures, be sure to wear protective equipment and start to work on the windward side

Environmental Precautions
Harmful to aquatic life, etc. Prevent from discharging into rivers, etc.

Methods and Materials for Containment and Cleaning Up
- Wash away after diluting thoroughly with a large quantity of water.
- Stop the flow with earth and sand, etc. and avoiding the spill from spreading, lead to a safe area. After preventing concentrated liquid from discharging into a river, etc., let it decompose spontaneously, dilute thoroughly with a large amount of water, and conform to the disposal considerations for disposal.

Prevention of Secondary Hazards
- Never place spilled liquid back in its original container.
- Avoid contact with combustibles such as wood, cloth in the immediate vicinity. In case of contact, wash away with a large quantity of water.

7. HANDLING AND STORAGE

Handling

For handling and storing, a notification must be made in accordance with the provisions of the Poisonous and Deleterious Substance Control Law and the Industrial Safety and Health Law. (Refer to '15. Regulatory Information')

Technical Measures
- Provide emergency showers and eyewash stations in the workplace and show their locations.
- Use apparatus and machinery with fewer openings to the atmosphere or provide local exhaust ventilation.
- Do not confine pipes used for hydrogen peroxide.
- Take measures to prevent hydrogen peroxide from scattering, leaking, etc.
- Suitable material is required for containers, pipes, etc. used for hydrogen peroxide.

Precautions
- Avoid unnecessary flames in the workplace.
- Do not place combustibles and flammables in the workplace.
- Once this product has been taken out of its container, it must not be restored in the original one.
- Wash combustibles such as wood, cloth, paper contaminated with hydrogen peroxide thoroughly with water.
- Avoid foreign substances such as acid, alkali, heavy metal, organic matter, and garbage to get mixed.
- Handle so as not to generate unnecessary vapor and mist.

Precautions for Safe Handling
- Wear protective equipment to prevent contact and inhalation.
- Wash hands/face thoroughly after handling.

Storage

Technical Measures
The outer walls, floor, and roof of storage facilities must be made of noncombustible material for fire spread prevention.

Conditions for Safe Storage
- Prevent foreign substances from entering the container.
- For a container, use a container cover having an air hole (for a tank, provide a vent pipe) so as not to be hermetically sealed.
- Do not store together with a substance expediting decompositions of combustibles and hydrogen peroxide.
- Provide water supply, etc. in the storage to facilitate washing away hydrogen peroxide when an accident involved with it occurs.
- Store in a well-ventilated place to prevent hydrogen peroxide from a high temperature. (It is desirable to avoid direct sunlight and store in a cool and dark place.)

Safe Materials for Containers/ Packaging
- For handling and storing, do not use material expediting decomposition of hydrogen peroxide.
- Suitable material: Metal : Aluminium, stainless steel (SUS304, SUS316)
  Resin : Fluororesin, polyethylene, glass
- Unsuitable material: Metal : Iron, copper, copper alloy, nickel-molybdenum alloy (Trade name: Hastelloy), titanium, titanium alloy, etc.
  Resin : Nylon, polybutadiene, epoxy resin, natural rubber
- Aluminium of purity equal to or greater than 99.5% (A1070) or aluminium alloy (A5052 or A5254) can be used for the material of facilities such as storage tanks. In case of metal material, perform inactivation treatment on the wetted surface.
- Any metal storage tank, container, piping or equipment must be passivated prior to handling peroxide (contact PIP for advice).
- PIP should be contacted whenever installation of new tanks or modifications to existing tanks or systems are planned. Specialist technical and safety advice are available through your PIP representative.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Limits

Japan Society for Occupational Health (2008)	Not established
ACGIH (2008)	TLV-TWA: 1 ppm TLV-STEL not established

Engineering Controls
- Provide emergency showers and eyewash stations in the workplace and show their locations.
- For handling, use apparatus and machinery with fewer openings to the atmosphere or provide local exhaust ventilation.
- Control limit: not established

Personal Protective Equipments

Respiratory protection:	Air breathing apparatus or disposable protective mask (ineffective for vapor) when there is a risk of inhaling vapor and mist.
Hand protection:	Rubber gloves
Eye protection:	Protective glasses/ goggles
Skin and body protection:	Work clothing, helmet, safety shoes/rubber boots, and rubber apron.

However, protective equipment made of natural leather must not be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless clear liquid
Odor (odor threshold)	Characteristically pungent odor
pH	2.0 – 3.5
Melting/ freezing point	-33°C
Boiling point	108°C
Flash point	None (although hydrogen peroxide itself does not burn, it decomposes to generate oxygen gas and heat, and thus it shows oxidizing capability)
Auto ignition/ ignition temperature	None (although hydrogen peroxide itself does not burn, it decomposes to generate oxygen gas and heat, and thus it shows oxidizing capability)
Flammability/ explosive limit	None (not explosive even if vapors get mixed with the air)
Vapor pressure	3.1 kPa (30°C)
Vapor density	Not reported
Specific gravity	1.128 (25/4°C)
Solubility	Soluble in water at any ratio
Partition coefficient: n-octanol/ water	Not reported
Decomposition temperature	Not reported
Evaporation rate	Not reported

10. STABILITY AND REACTIVITY

Stability
- Very stable unless foreign substances such as heavy metal, alkali, readily oxidized organic matters get mixed.
- When hydrogen peroxide decomposes into water and oxygen gas, heat of 98.05kJ/mol is generated.
- Heating expedites decomposition. (When the temperature increases by 10°C, the decomposition speed will be approximately 2.2 times faster.)

Possibility of Hazardous Reactions
- Oxidizes various inorganic compounds and organic compounds as well.
- Contact with platinum, silver, copper, iron, chromium, manganese, etc. may cause rapid decomposition to generate oxygen gas and heat, leading to explosion if in a container tightly closed.

Condition to Avoid
Heating, getting mixed with foreign substances such as heavy metal, alkali, readily oxidized organic matters.

Incompatible Materials
- Heavy metal, alkali, readily oxidized organic matters, etc.
- Iron, copper, copper alloy, titanium, titanium alloy, alloys of Hastelloy series, polyamide (nylon), polybutadiene, epoxy resin, natural rubber, asbestos molding material, etc.

Hazardous Decomposition Products
Oxygen gas (oxidizer)

11. TOXICOLOGICAL INFORMATION

Acute Toxicology
Oral Rat LD_{50}: 1,518 mg - H_2O_2/ kg male rats (WISTAR-JCL) (When 9.6% H_2O_2 is used) *2
Oral Rat LDL_0: 805 mg - 70%H_2O_2/ kg male & female rats (Crl:CD BR) (When 70% H_2O_2 is used) *11
Inhalation vapor rat LC_{50}: 1,438 ppm *15

Skin Corrosion/ Irritation
Irritating to skin, mucous membranes *1

Serious Eye Damage/ Eye Irritation
May cause loss of eyesight if in eye.

Germ Cell Mutagenity
Weak mutagen of Salmonella typhimurium *7

Carcinogenicity
Mice (C57BL) were dosed with drinking water containing hydrogen peroxide for 740 days. There are cases of cancer occurring in duodenum. *4, *5 (The concentrations of hydrogen peroxide in drinking water were 0.1% and 0.4%)

Rats (FISHER F344) administered with drinking water containing H_2O_2 for 78 weeks did not indicate carcinogenicity. *4, *6 (H_2O_2 concentrations in drinking water were 0.3% and 0.6%)

IARC (2009): Group 3 (Classification not possible for human carcinogenicity) *12

ACGIH (2009): A3 (Animal carcinogen) *13
(The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histological type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.)

Reproductive Toxicity
In vitro experiments indicate effects on human sperm. Although no animal studies report general toxicity for parent animals, the product is classified as Category 2, based on reports on effects on sperm motility, on estrous cycles of females, on reduced numbers of dams giving birth, and lower birth weights. *14

Others

Sub-acute Toxicity
- When male rats (WISTAR) were orally dosed with hydrogen peroxide, 60mg/kg/day, growth restraint was observed in 20 days or later. *3, *4 (when 0.6wt/vol% H_2O_2 was used)
- When male rats (WISTAR-JCL) were orally dosed with 56.2mg/kg hydrogen peroxides 6 days/week for 12 weeks, no effect was observed. *2 (when 5wt/vol% H_2O_2 was used)

12. ECOLOGICAL INFORMATION

Ecotoxicity

Fish Toxicity

Saltwater fish	Siganus fuscescens	LC_{50}	H_2O_2 224 mg/L	24 hours	*8, *9
	Tridentiger bifasciatus	LC_{50}	H_2O_2 155 mg/L	24 hours	*8, *9
	Trachurus symmetricus	LC_{50}	H_2O_2 89 mg/L	24 hours	*8, *9
Freshwater fish	Carp	LC_{50}	H_2O_2 42 mg/L	24 hours	*10

Persistence and Degradability
Not reported (Spontaneous degradation)

Bioaccumulative Potential
Not reported

Mobility in Soil
Not reported

13. DISPOSAL CONSIDERATION

Residual Waste

- Follow the items mentioned in "7. Handling and Storage". In addition, decompose unnecessary hydrogen peroxide by reacting gradually with a reducing agent such as sodium sulfite or with metals, etc.
- Dispose of exhausted water in compliance with effluent standards (pH, COD, etc.).
- When hydrogen peroxide is discharged in activated sludge treatment facilities, micro-organisms (activated sludge) may be annihilated and their function may weaken to result in disability or low treatment efficiency.
- After consulting the manufacturer for safe disposal, dispose of unused hydrogen peroxide.

Contaminated Containers and Packaging

- After diluting residues and deposits with water, remove them by washing away for disposal.
- If a foreign substance enters a container in which this product remains, abnormal decomposition may be led to.
- After washing contaminated container and packaging thoroughly with water, dispose of them in accordance with regulations of the local government.

14. TRANSPORT INFORMATION

International Maritime Dangerous Goods (IMDG)

UN Number	UN 2014
Class (Subsidiary)	5.1 (8)
Proper Shipping Name	Hydrogen peroxide, aqueous solution
Hazard label	Oxidizing agent + Corrosive
Marine pollutant	No
Placard	2014
Packing group	II
Emergency info	EmS 5.1-02

International Air Transport Association (IATA)

UN Number	UN 2014
Class (Subsidiary)	5.1 (8)
Proper Shipping Name	Hydrogen peroxide, aqueous solution
Hazard label	Oxidizer + Corrosive
Marine pollutant	No
Packing group	II
Emergency info	ERG Code 5C
Other	Forbiden over 40%

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Reported/ included (No: 231-765-0)
US. Toxic Substances Control Act	TSCA	The components of this product are all reported/ included on the TSCA Inventory.
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	Reported/ included
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can.	DSL	All components of this product are reported/ included on the Canadian

Gaz. Part II, Vol. 133)		DSL list.
Japan. Kashin-Hou Law List	ENCS (JP)	Is not reported/ included
Korea. Toxic Chemical Control Law (TCCL) List	KECI (KR)	Reported/ included
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	Is not reported/ included
China. Inventory of Existing Chemical Substances	INV (CN)	Is not reported/ included
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	Reported/ included

Indonesian Regulations

- Keputusan Menteri Tenaga Kerja RI (Indonesian Ministry of Manpower) No. Kep. 187/ Men/ 1999: Pengendalian Bahan Kimia Berbahaya di Tempat Kerja (Hazardous Chemical Control in Workplace)
- Categorized as Oxidizing Agent

16.OTHER INFORMATION

References

*1 Compilation of Guideline for Chemical Disaster Prevention (1996) by The Chemical Society of Japan
*2 Page 531, 5th and 6th, Volume 23 of Journal of the Medical Society of Toho University (1976)
*3 Page 68, Volume 10 of Shokuhin Eiseigaku Zasshi (1969)
*4 Instruction Manual of Official Formulary of Food Additives
*5 Page 315, Volume 73 of GANN (1982) [English]
*6 Page 956, Last Volume of Study Report by Cancer Research Grant from the Ministry of Welfare (1980)
*7 Page 211, Volume 9 of Teratogenesis, Carcinogenesis & Mutagenesis (1989)
*8 Page 117, 2nd, Volume 29 of Cultivation (1992)
*9 Page 221, Volume 37 of Aquaculture (1989)
*10 Page 165, 4th, The Bulletin of the Graduate School of Bioresources Mie University (1990)
*11 E. I. du Pont de Nemous and Company Haskell Laboratory Report (1996)
*12 IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans (1987)
*13 American Conference of Governmental Industrial Hygienists 2001 TLVs and BEIs
*14 ECETOC JACC (1993)
*15 UE-RAR (2003)

Further Information

For further information, contact

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Telephone No: (62) 264-313383, 264-313387, 264-318577

Disclaimer

The contents herein are based on materials, information, and data available as of today. However, concentrations, physicochemical properties, and hazards in this MSDS are not guaranteed. As precautions are described on the subject of the normal use and handling, please take appropriate safety measures for special use and handling.