SAFETY DATA SHEET

Hydrogen Peroxide 50% Standard

Version: 3
Revision Date: 9th Jul 2020

1. Product and Company Identification

Product Name: Hydrogen Peroxide 50% Standard

Recommended Use of the Chemical and Restrictions on Use:

Recommended Use: Industrial bleaching, processing, pollution abatement and general oxidation reactions

Restrictions on Use: Use as recommended by the label.

Manufacturer
THAI PEROXIDE CO., LTD.
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2. Hazards Identification

GHS Classification

Acute Toxicity (Oral) – Category 4
Acute Toxicity (Dermal) – Category 5
Skin Corrosion/Irritation – Category 1B
Serious Eye Damage/Eye Irritation – Category 1
Specific target organ toxicity (single exposure) – Category 3
Oxidizing Liquids – Category 2
Acute hazards to the aquatic environment, category 2

GHS Label Elements

Signal Word
DANGER

Hazard Statements
H302 – Harmful if swallowed
H314 – Causes severe skin burns and eye damage
H318 – Causes serious eye damage
H313 – May be harmful in contact with skin
H335 – May cause respiratory irritation

H272 – May intensify fire; oxidizer
H401 – Toxic to aquatic life

Precautionary Statements

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.
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
P363 - Wash contaminated clothing before reuse
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

3. Composition / Information on Ingredients

Formula: HO – OH

Chemical Name	CAS#	EC Number	Wt%
Hydrogen Peroxide	7722-84-1	231-765-0	50
Water	7732-18-5	231-791-2	50

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. Overexposure symptoms are coughing, giddiness and sore throat. . 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 product major, or even fatal, injury to organs if a large amount has been ingested. In case of skin contact, may cause burns, erythema, blisters or even necrosis.

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 opthalmologic 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, attemps 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.
Hazardous Combustion Products	On decomposition product releases oxygen which may intensify fire.
Explosion data **Sensitivity to Mechanical Impact**	Not sensitive
Sensitivity to Static Discharge	Not sensitive
Protective equipment and precautions for firefighters	Use water spray to cool fire exposed surfaces and protect personnel. Move containers from 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	See Section 12 for additional Ecological 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

Use only in well-ventilated areas. Keep/ Store away from clothing/ combustible materials. Wear personal protective equipment. Never return unused hydrogen peroxide to original container. Contamination may cause decomposition and generation of oxygen gas which could result in high pressures and possible container rupture. Empty drums should be triple rinsed with water before discarding. Utensils used for handling hydrogen peroxide should only be made of glass, stainless steel, aluminum or plastic. Pipes and equipment should be passivated before first use. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner.

Storage

Keep containers out of direct sunlight and away from combustibles and heat sources. For long term storage, provide mechanical general and/or local exhaust ventilation to prevent accumulation of vapor or mist released 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.

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

Exposure Limits

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (TWA) 1.4 mg/m^3 (TWA)	IDLH: 75 ppm TWA: 1 ppm TWA: 1.4 mg/m^3

Appropriate engineering controls

Engineering measures

Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation.

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). 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 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

Odor:	Odorless
Appearance:	Clear, colorless liquid
Autoignition Temperature:	Non-combustible
Flammability (Solid, Gas)	Not flammable
Flammability Limit in Air	
Lower flammable limit (LFL):	Not applicable
Upper flammable limit (UFL):	Not applicable
Boiling Point:	114°C
Coefficient of Oil / Water:	Not available
Density / Weight Per Volume:	Not available
Evaporation Rate:	> 1 (Butyl Acetate = 1)
Flash Point:	Non-combustible
Freezing Point:	-52°C
Odor Threshold:	Not available
Oxidizing Properties:	Strong oxidizer
Percent Volatile:	100
pH:	<=1.6
Solubility in Water:	100 %
Specific Gravity:	1.19 @ 25°C

Vapor Density:	Not available (Air = 1)
Vapor Pressure:	18.3 mmHg @ 30°C

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	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.
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	60% solution: LD50 801 mg/kg bw (female rat) Method : OECD Test Guideline 401 60% solution: LD50 872 mg/kg bw (male rat) Method : OECD Test Guideline 401
LD50 Dermal	35% solution: LD50 > 2000 mg/kg bw (rabbit)
LC50 Inhalation	50% solution: LC50 > 170 mg/m 3 (rat) (4-hr) Hydrogen Peroxide vapors: LC50 9400 mg/m³ (mouse) (5 - 15 minutes) Hydrogen Peroxide vapors: LC50 > 2160 mg/m³ (mouse)

Serious eye damage/eye irritation	Corrosive. Risk of serious damage to eyes.
Skin corrosion/irritation	Corrosive to skin. Causes severe burns.
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	IARC	NTP	OSHA	Other
Hydrogen Peroxide	Group 3	Not listed	Not listed	(ACGIH) Listed (A3, animal carcinogen)

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. No toxicity to reproduction in animal studies.

STOT - single exposure May cause respiratory irritation.

STOT - repeated exposure Not classified.

Target organ effects Eyes, Respiratory System, Skin.

Aspiration hazard Aspiration risk: may cause lung damage if swallowed.

12. Ecological Information

Ecotoxicological Information:
Fish Leuciscus idus 72-hour LC50 = 35 mg/L
Fish Pimephales promelas 96-hour LC50 = 16.4 mg/L
Daphnia magna 24-hour EC50 = 7.7 mg/L
Daphnia pulex 48-hour EC50 = 2.4 mg/L
Algae Skeletonema costatum 72-hour EC50 = 1.38 mg/L
Daphnia magna 21-day NOEC = 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 contaminants.

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.

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

UN Recommendations on the Transport of Dangerous Goods

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

Primary Hazard Class / Division: 5.1 (Oxidizer)

Subsidiary Risk: 8

UN Number: UN 2014

UN Packing Group: II

Label(S): Oxidizer + Corrosive

Placard(S): 5.1 (Oxidizer) + Corrosive

International Maritime Dangerous Goods (IMDG)

Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 20%, but not more than 60% hydrogen peroxide.

International Civil Aviation Organization (ICAO) /
International Air Transport Association (IATA)

Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 20% but not more than 40% hydrogen peroxide. (stabilized as necessary)*

(*) Air regulations permit shipment of Hydrogen Peroxide (20 - 40% by weight) in unvented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all TPL Hydrogen Peroxide containers are vented and therefore, air shipments of TPL H2O2 is not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

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

15. Regulatory Information

International Inventories

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

16. Other Information

NFPA	**Health Hazards** 3	**Flammability** 0	**Stability** 1	**Special Hazards** OX
HMIS	**Health Hazards** 3	**Flammability** 0	**Physical hazard** 1	**Personal Protection** 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)

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