MATERIAL SAFETY DATA SHEET HYDROGEN PEROXIDE 50%

1: Chemical Product Identification

Trade Name:	HYDROGEN PEROXIDE
Synonym:	Hydroperoxide, Hydrogen dioxide
Chemical Formula:	H2O2
Uses of the Substance/Mixture:	Bleaching agents Chemical industry Electronic industry Metal treatment Odour agents Oxidizing Agents Textile industry Water treatment Manufacture of pulp, paper and paper products

2: Hazards Identification

Classification of the substance or mixture GHS Classification (UN)

Oxidizing liquids, Category 2	H272: May intensify fire; oxidizer.
Acute toxicity, Category 4	H302: Harmful if swallowed.
Skin corrosion/irritation, Sub-category 1B	H314: Causes severe skin burns and eye damage.
Serious eye damage/eye irritation, Category 1	H318: Causes serious eye damage.
Specific target organ toxicity - single exposure,H335:	May cause respiratory irritation.
Category 3	(Respiratory system)
Short-term (acute) aquatic hazard, Category 2	H401: Toxic to aquatic life.

Label elements

GHS label elements (UN)

Hazardous products which must be listed on the label

CAS-No. 7722-84-1 Hydrogen Peroxide

Pictogram



Signal word

Danger

Hazard statements

H272	May intensify fire; oxidizer.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.
H401	Toxic to aquatic life. Precautionary statements General None Prevention
P210	Keep away from heat, hot surfaces, sparks, open f lames and other ignition sources. No smoking.
P220	Keep away from clothing and other 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.
P273	Avoid release to the environment.

P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. Response
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
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 CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use water spray to extinguish. Storage
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up. Disposal
P501	Dispose of contents/ container to an approved waste disposal plant.
Other hazards which do not result in classification:	None known.

3. Composition and Information on Ingredients

3.1 Substance

Not applicable, this product is a mixture.

Mixture Information on Components and Impurities

Composition:

Name	CAS #	% by Weight
Hydrogen peroxide	7722-84-1	49.5–50.5

GHS CLASSIFICATION: Oxidizing liquids, Category 1 ; H271 Acute toxicity, Category 4 ; H302 Skin corrosion, Sub-category 1A ; H314 Serious eye damage, Category 1 ; H318 Specific target organ toxicity - single exposure, Category 3 ; H335 Short-term (acute) aquatic hazard, Category 2; H401 Long-term (chronic) aquatic hazard, Category 3 ; H412

SPECIFIC CONCENTRATION LIMITS: C: >= 70 %, Oxidizing liquids, Category 1; H271 C: 50 - < 70 %, Oxidizing liquids, Category 2; H272 C: >= 70 %,

Skin corrosion, Category 1A; H314 C: 50 - < 70 %, Skin corrosion, Category 1B; H314 C: 35 - < 50 %, Skin irritation, Category 2; H315 C: 8 - < 50 %, Serious eye damage, Category 1; H318 C: 5 - < 8 %, Eye irritation, Category 2; H319 C: >= 35 %, Specific target organ toxicity - single exposure, Category 3; H335 For the full text of the H-Statements mentioned in this Section, see Section 16.

4: First Aid Measures

Description of first aid measures

General advice

- Show this safety data sheet to the doctor in attendance. In case of inhalation
- Move to fresh air.
- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.

- Call a physician immediately.

In case of skin contact

- Take off contaminated clothing and shoes immediately.
- Wash off immediately with plenty of water.
- Keep warm and in a quiet place.
- Call a physician or poison control centre immediately.
- Wash contaminated clothing before re-use.

In case of eye contact

- Call a physician or poison control centre immediately.
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).
- Take victim immediately to hospital. In case of ingestion
- Call a physician or poison control centre immediately.
- Take victim immediately to hospital.
- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.
- If victim is conscious:
- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- If victim is unconscious:
- Artificial respiration and/or oxygen may be necessary.

Most important symptoms and effects, both acute and delayed

In case of inhalation

- Symptoms o Breathing difficulties o Cough o pulmonary oedema o Nausea o Vomiting
- Effects ➢ Corrosive to respiratory system. ➢ Repeated or prolonged exposure
- Nose bleeding
- Risk of chronic bronchitis In case of skin contact
- Symptoms - Redness

- Swelling of tissue

- Effects
- Corrosive
- Causes severe burns.

In case of eye contact

- Symptoms
- Redness
- Lachrymation
- Swelling of tissue
- Effects
- Corrosive
- Causes severe burns.
- Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In case of ingestion
- Symptoms

- Nausea
- Abdominal pain
- Bloody vomiting
- Diarrhoea
- Suffocation
- Cough
- Severe shortness of breath
- Effects
- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
- Risk of respiratory disorder Indication of any immediate medical attention and special treatment needed Notes to physician
- Take victim immediately to hospital.
- Immediate medical attention is required.
- Consult with an ophthalmologist immediately in all cases.
- Burns must be treated by a physician.
- If swallowed
- Avoid gastric lavage (risk of perforation).
- Keep under medical supervision for at least 48 hours.

5: Fire and Explosion Data

Extinguishing media Suitable extinguishing media

- Water
- Water spray

Unsuitable extinguishing media

- None

Special hazards arising from the substance or mixture

- Oxidizing
- Contact with combustible material may cause fire.
- Contact with flammables may cause fire or explosions.
- Risk of explosion if heated under confinement.
- Decomposition will cause oxygen release which may intensify fire

Advice for firefighters

Special protective equipment for firefighters

- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.
- Wear chemical resistant oversuit

Further information

- Keep product and empty container away from heat and sources of ignition.
- Keep containers and surroundings cool with water spray.
- Approach from upwind.
- Prevent fire extinguishing water from contaminating surface water or the ground water system

6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel

- Evacuate personnel to safe areas.
- Keep people away from and upwind of spill/leak.

Advice for emergency responders

- Use personal protective equipment.
- Drying of this product on clothing or combustible materials may cause fire.
- Keep wetted with water.
- Prevent further leakage or spillage.
- Keep away from incompatible products Environmental precautions
- Should not be released into the environment.
- If the product contaminates rivers and lakes or drains inform respective authorities. Methods and materials for containment and cleaning up
- Dilute with plenty of water.
- Dam up.
- Do not mix waste streams during collection.
- Soak up with inert absorbent material.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.
- Treat recovered material as described in the section "Disposal considerations". Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

7: Handling and Storage

Precautions for safe handling

- Use only in well-ventilated areas.
- Before all operations, passivate the piping circuits and vessels according to the procedure recommended by the producer.
- Use only clean and dry utensils.
- Never return unused material to storage receptacle.
- Keep away from heat.
- Avoid inhalation, ingestion and contact with skin and eyes.
- Keep away from incompatible products

Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice. Conditions for safe storage, including any incompatibilities Technical measures/Storage conditions
- Keep only in the original container.
- Store in a well-ventilated place. Keep cool.
- Store in a receptacle equipped with a vent.
- Keep in properly labelled containers.
- Keep container closed.
- Keep in a bunded area.
- Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- Regularly check the condition and temperature of the containers.

- Keep away from: Incompatible products

Packaging material Suitable material

- aluminium 99,5 %
- stainless steel 304L / 316L
- Approved grades of HDPE.

Specific end use(s)

- Contact your supplier for additional information

8: Exposure Controls/Personal Protection

Control parameters Components with other occupational exposure limits

Components	Value type Value Basis
Hydrogen peroxide	TWA 1 ppm USA. ACGIH Threshold Limit Values (TLV)

Exposure controls Control measures

Engineering measures

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

Individual protection measures

Respiratory protection

- Use respirator when performing operations involving potential exposure to vapour of the product.
- When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
- Respirator with a vapour filter (EN 141)
- Recommended Filter type: ABEK-P2
- Self-contained breathing apparatus in case of: 1) large uncontrolled emissions, 2) insufficient oxygen, 3) the maskand cartridge do not give adequate protection. Hand protection
- Impervious gloves
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Suitable material
- Nitrile rubber
- Break through time: > 480 min
- Glove thickness: 1.3 mm
- Nitrile/Neopren gloves
- Break through time: 190 min
- Glove thickness: 0.2 mm

Eye protection

- Chemical resistant goggles must be worn.
- If splashes are likely to occur, wear:
- Tightly fitting safety goggles
- Face-shield

Skin and body protection

- Impervious clothing
- If splashes are likely to occur, wear:
- Chemical resistant apron

- Boots
- Suitable material
- PVC
- Natural Rubber

Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice. Environmental exposure controls
- Dispose of rinse water in accordance with local and national regulations.

9: Physical and Chemical Properties

Physical state and appearance:	Colourless Liquid.
odour:	Odourless
Odour Threshold:	No data available
Molecular Weight:	34 g/mol
pH:	2.0 (21 °C) H2O2 50 % pKa: 11.6 (25 °C)
Initial Boiling Point and Boiling Range:	125 °C H2O2 70
Melting Point/Freezing pont:	Freezing point: 40.3 °C H2O2 70 %
Flash Point:	Not Applicable
Evaporation rate (Butylacetate = 1):	Not Available
Flammability (solid, gas):	Not applicable
Flammability (liquids):	The product is not flammable.
Flammability/Explosive limit:	The product is not flammable
Explosiveness:	

Not explosive

With certain materials (see section 10).

Auto-ignition temperature:	The product is not flammable
Vapour pressure:	2 hPa (30 °C) H2O2 70 %
Vapour density:	1.02
Density:	Bulk density: Not applicable
Relative density:	1.29 H2O2 70 %
Relative density:	1.44 (25 °C) Pure substance
Solubility:	Water solubility: soluble
Solubility in other solvents:	organic polar solvents : soluble
Partition coefficient: n-octanol/water:	log Pow: -1.57

Method: Calculation method

Decomposition temperature:	>= 60 °C
Self-Accelerating	decomposition temperature (SADT)
Decomposition temperature:	< 60 °C Slow decomposition
Viscosity:	Viscosity, dynamic : 1.26 mPa.s (20 °C) H2O2 70 %

1.249 mPa.s (20 °C) Pure substance

Explosive properties No data available

Oxidizing properties:	The substance or mixture is classified as oxidizing with the category 2
Other information	
Henry's Constant	0.00075 Pa.m3/mol (20 °C) not significant, Air, Volatility
Surface tension	77.2 mN/m (20 °C)H2O2 70 %

10: Stability and Reactivity Data

Reactivity

- Strong oxidizer. Contact with other material may cause fire.
- Decomposes on heating with potential large quantities of gas release (oxygen).
- Potential for exothermic hazard

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.
- - Contact with incompatible material may cause exothermic decomposition with gas release.
- - Risk of explosion if heated under confinement.
- - Fire or intense heat may cause violent rupture of packages.

Conditions to avoid

- Contamination
- To avoid thermal decomposition, do not overheat.

Incompatible materials

- Acids
- Bases
- Metals
- Heavy metal salts
- Powdered metal salts
- Reducing agents
- Organic materials
- Flammable materials

Hazardous decomposition products

- Oxygen

11: Toxicological Information

.1 Information on toxicological effects Acute toxicity

Acute oral toxicity

hydrogen peroxide	Acute toxicity estimate : 431 mg/kg - Rat , male and femaleThis product is classified as acute toxicity, category 4 Unpublished reports Acute inhalation toxicity hydrogen peroxide

LC50 - 4 h (vapour) : > 0.17 mg/l - Rat Not classified as hazardous for acute inhalation toxicity according to GHS.Unpublished reports

Acute dermal toxicity

hydrogen peroxide	Acute toxicity estimate : 6,440 mg/kg - Rabbit Test substance: Hydrogen peroxide Not classified as hazardous for acute dermal toxicity according to GHS.Unpublished reports
Acute toxicity (other routes of administration)	No data available
Skin corrosion/irritation	Causes burns.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitisation

Hydrogen Peroxide	Does not cause skin sensitisation. not sensitising

Mutagenicity

Genotoxicity in vitro

Hydrogen Peroxide	Ames test with and without metabolic activation positive Published data Chromosome aberration test in vitro with and without metabolic activation positive Unpublished reports Genotoxicity in vivo
Hydrogen Peroxide	In vivo micronucleus test - Mouse Oral Method: OECD Test Guideline 474 negative Unpublished reports

Carcinogenicity

Hydrogen Peroxide	No data available

Toxicity for reproduction and development

Toxicity to reproduction/Fertility

Hydrogen Peroxide	No toxicity to reproduction

Developmental Toxicity/Teratogenicity

hydrogen peroxide	No toxicity to reproduction

STOT

STOT - single exposure

hydrogen peroxide	Exposure routes: Inhalation Target Organs: Respiratory Tract May cause respiratory irritation.

STOT - repeated exposure

hydrogen peroxide	The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
hydrogen peroxide	Inhalation (vapour) 90-day - RatNOAEC: 7 ppm Target Organs: Respiratory Tract Method: OECD Test Guideline 413 Unpublished reports 90-day - Rat NOAEL: 100 ppm Target Organs: Gastrointestinal tract Method: OECD Test Guideline 408 drinking water Unpublished reports
Experience with human exposure	No data available
Aspiration toxicity	No data available

12: Ecological Information

Toxicity

Aquatic Compartment Acute toxicity to fish

hydrogen peroxide	LC50 - 96 h : 16.4 mg/l - Pimephales promelas (fathead minnow) semi-static test Analytical monitoring: yes Unpublished internal reports Harmful to fish. Acute toxicity to daphnia and other aquatic invertebrates
hydrogen peroxide	EC50 - 48 h : 2.4 mg/l - Daphnia pulex (Water flea)semi-static test Analytical monitoring: yes Unpublished internal reports Toxic to aquatic invertebrates.

Toxicity to aquatic plants

hydrogen peroxide	ErC50 - 72 h : 2.62 mg/l - Skeletonema costatum (marine diatom) static test Analytical monitoring: yes Unpublished internal reports Toxic to algae.

Toxicity to microorganisms

hydrogen peroxide	EC50 - 0.5 h : 466 mg/l - activated sludge static test Analytical monitoring: yes Method: OECD Test Guideline 209 Unpublished internal reports
Chronic toxicity to fish	No data available
Chronic toxicity to daphnia and other aquatic invertebrates	
hydrogen peroxide	NOEC: 0.63 mg/l - 21 Days - Daphnia magna (Water flea)flow-through test Analytical monitoring: yes Published data Harmful to aquatic invertebrates with long lasting effects. Persistence and degradability
Abiotic degradation	No data available
Physical- and photo-chemical elimination	No data available
Biodegradation	
Biodegradability	
hydrogen peroxide	Ready biodegradability study: Method: Degradation in sewage treatment plants The substance fulfills the criteria for ultimate aerobic biodegradability and readybiodegradability Inoculum: activated sludge Unpublished internal reports Degradability assessment
hydrogen peroxide	The product is considered to be rapidly degradable in the environment
Bioaccumulative potential	
Partition coefficient: n-octanol/water	
hydrogen peroxide	Not potentially bioaccumulable
Bioconcentration factor (BCF)	
hydrogen peroxide	Not potentially bioaccumulable
Mobility in soil	
Adsorption potential (Koc)	
hydrogen peroxide	Adsorption/SoilKoc: 1.58 Log Koc: 0.2
Method:	Structure-activity relationship (SAR)
Unpublished reports	
Known distribution to environmental compartments	
hydrogen peroxide	Ultimate destination of the product : Water

Results of PBT and vPvB assessment This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT). This mixture contains no substance considered to be very persistent and verybioaccumulating (vPvB).

Other adverse effects

Ecotoxicity assessment

Short-term (acute) aquatic hazard	Toxic to aquatic life.
Long-term (chronic) aquatic hazard	Not classified due to data which are conclusive although insufficient for classification.

13: Disposal Considerations

Waste treatment methods Product Disposal

- Limited quantity
- Dilute with plenty of water.
- Flush into sewer with plenty of water.
- Maximum quantity
- Contact manufacturer.

- Contact waste disposal services.
- In accordance with local and national regulations

Advice on cleaning and disposal of packaging

- Empty containers.
- Clean container with water.
- Dispose of rinse water in accordance with local and national regulations.
- Where possible recycling is preferred to disposal or incineration.
- In accordance with local and national regulations.

14: Transport Information

IMDG

UN number	UN 2014
Proper shipping name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Transport hazard class	5.1
Subsidiary hazard class:	8
Label(s):	5.1 (8)

Packing group

Packing group	II
Environmental hazards	NO

Marine pollutant

Special precautions for user

EmS	F-H , S-Q For personal protection see section 8.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No data available

IATA

UN number	UN 2014
Proper shipping name	Not permitted for transport
Transport hazard class	Not permitted for transport

Packing group

Environmental hazards	NO Special precautions for user
Packing instruction (cargo aircraft)	Not permitted for transport
Packing instruction (passenger aircraft)	Not permitted for transport

For personal protection see section 8.

Other information	:IATA: permitted under 40% Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office

15: Other Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Local regulations	No data available

Notification status

Inventory Information	Status
United States TSCA Inventory	- Listed on Inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory

Australia Inventory of Chemical Substances	- Listed on Inventory (AICS)
Japan. CSCL - Inventory of Existing and New	- Not in compliance with the inventory Chemical Substances
Korea. Korean Existing Chemicals Inventory	- Listed on Inventory (KECI)
China. Inventory of Existing Chemical	- One or more components not listed on Substances in China (IECSC) inventory
Philippines Inventory of Chemicals and	- One or more components not listed on Chemical Substances (PICCS) inventory
Mexico INSQ (INSQ)	- One or more components not listed on inventory
New Zealand. Inventory of Chemical	- Listed on Inventory Substances
European Inventory of Existing Commercial	- When purchased from a Solvay legal entity Chemical Substances (EINECS) based in the EEA ("European Economic Area"), this product is compliant with the registration provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, and/or registered. When purchased from a legal entity outside of the EEA, please contact your local representative for additional information.

16: Other Information

Full text of H-Statements

- H271 May cause fire or explosion; strong oxidiser.
- H272 May intensify fire; oxidizer.
- H302 Harmful if swallowed.
- H314 Causes severe skin burns and eye damage.
- H318 Causes serious eye damage.
- H335 May cause respiratory irritation.
- H401 Toxic to aquatic life.
- H412 Harmful to aquatic life with long lasting effects.

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA 8-hour, time-weighted average

Further information

- Distribute new edition to clients
- Update
- See section 2
- See section 3
- See section 8

EXCLUSION OF LIABILITY The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. Such information is only given as a

guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.