

SAFETY DATA SHEET

North American Version

HYDROGEN PEROXIDE (Conc. 60 %)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or preparation

Product name : HYDROGEN PEROXIDE (Conc. 60 %)
Product grade(s) : Interox® Chemical Grade 60% Hydrogen Peroxide
Interox® Dilution Grade 60% Hydrogen Peroxide
Interox® Technical Grade 60% Hydrogen Peroxide
Chemical Name : Hydrogen peroxide
Synonyms : Hydroperoxide, Hydrogen dioxide
Molecular formula : H₂O₂
Molecular Weight : 34 g/mol

1.2. Use of the Substance/Preparation

Recommended use : - Bleaching agent
- Chemical industry
- Metal treatment
- Oxidising Agents
- Pulp and paper

1.3. Company/Undertaking Identification

Address : SOLVAY CHEMICALS, INC.
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone : 1 (800) 424-9300 CHEMTREC® (USA & Canada)
01-800-00-214-00 (MEX. REPUBLIC)

Contact telephone number : US: +1-800-765-8292 (Product information)
(product information): US: +1-713-525-6500 (Product information)

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 3 F= 0 I= 3 S= OX
HMIS : H= 3 F= 0 R= 3 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : liquid
Colour : colourless
Odour : pungent

Main effects

- The preparation is classified as dangerous in accordance with Directive 1999/45/EC.
- Oxidising
- Contact with combustible material may cause fire.
- Harmful by inhalation and if swallowed.
- Causes burns.

2.2. Potential Health Effects:

Inhalation

- Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough.
- Breathing difficulties
- Inhaled corrosive substances can lead to a toxic oedema of the lungs.
- Nausea
- Vomiting
- Repeated or prolonged exposure: Risk of sore throat, nose bleeds, chronic bronchitis.

Eye contact

- Severe eye irritation
- Redness
- Lachrymation
- Swelling of tissue
- Risk of serious damage to eyes.
- May cause permanent eye injury.
- May cause blindness.

Skin contact

- Severe skin irritation
- Redness
- Swelling of tissue
- Causes burns.

Ingestion

- Paleness and cyanosis of the face.
- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.
- Risk of shock.
- Excessive fluid in the mouth and nose, with risk of suffocation.
- Risk of throat (o)edema and suffocation.
- Bloating of stomach, belching.
- Nausea
- Bloody vomiting
- Cough
- Breathing difficulties
- Risk of chemical pneumonitis and pulmonary (o)edema.

Other toxicity effects

- See section 11: Toxicological Information

2.3. Environmental Effects:

- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hydrogen peroxide

CAS-No. : 7722-84-1
Concentration : appr. 60.0 %

4. FIRST AID MEASURES

4.1. Inhalation

- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Oxygen or artificial respiration if needed.
- Keep warm and in a quiet place.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.

4.2. Eye contact

- 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).
- Consult with an ophthalmologist immediately in all cases.
- Take victim immediately to hospital.

4.3. Skin contact

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

4.4. Ingestion

- Call a physician immediately.
- Take victim immediately to hospital.

If victim is conscious:

- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.

If victim is unconscious but breathing:

- Artificial respiration and/or oxygen may be necessary.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

- Water
- Water spray

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- Oxidising
- Oxygen released in 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.

5.4. Hazardous decomposition products

- Oxygen
- The release of other hazardous decomposition products is possible.

5.5. Special protective equipment for fire-fighters

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

5.6. Other information

- Keep product and empty container away from heat and sources of ignition.
- Keep containers and surroundings cool with water spray.
- Approach from upwind.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

- Refer to protective measures listed in sections 7 and 8.
- Isolate the area.
- Keep away from Incompatible products.
- Prevent further leakage or spillage if safe to do so.
- In case of contact with combustible material, keep material wet with plenty of water.

6.2. Environmental precautions

- In case of accidental release or spill, immediately notify the appropriate authorities if required by Federal, State/Provincial and local laws and regulations.
- Do not dump into any sewers, on the ground, or into any body of water. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations.

6.3. Methods for cleaning up

- Dam up.
- Soak up with inert absorbent material.
- Dilute with plenty of water.
- Do not add chemical products.
- Treat recovered material as described in the section "Disposal considerations".
- Never return spills in original containers for re-use.

7. HANDLING AND STORAGE

7.1. Handling

- Use only in well-ventilated areas.
- Keep away from heat.
- Keep away from Incompatible products.
- May not get in touch with:
 - Organic materials
- Use only equipment and materials which are compatible with the product.
- Before all operations, passivate the piping circuits and vessels according to the procedure recommended by the producer.
- Never return unused material to storage receptacle.
- Use only in an area with adequate water supply
- Containers and equipment used to handle the product should be used exclusively for that product.

7.2. Storage

- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from Incompatible products.
- Keep away from combustible material.
- Store in a receptacle equipped with a vent.
- Store in original container.
- Keep container closed.
- Keep in a banded area.

- Regularly check the condition and temperature of the containers.
- Information about special precautions needed for bulk handling is available on request.

7.3. Packaging material

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

7.4. Other information

- Refer to protective measures listed in sections 7 and 8.
- Do not confine the product in a circuit, between closed valves, or in a container without a vent.
- In industrial installations, apply the rules for the prevention of major accidents (consult an expert).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Hydrogen peroxide

- US. ACGIH Threshold Limit Values 01 2006
time weighted average = 1 ppm
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
Permissible exposure limit = 1 ppm
Permissible exposure limit = 1.4 mg/m³
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
time weighted average = 1 ppm
time weighted average = 1.4 mg/m³

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.
SAEL = Solvay Acceptable Exposure Limit, Time Weighted Average for 8 hour workdays. No Specific TLV STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV TWA.

8.2. Engineering controls

- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.
- Refer to protective measures listed in sections 7 and 8.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.
- Wear an approved full-face air supplied respirator for excessive or unknown concentrations. Selected chemical cartridges for respirators, i.e. OV, OV/AG, GME have been tested successfully under lab conditions to remove hydrogen peroxide and peracetic acid vapors in concentrations exceeding the applicable exposure limits. Further information is available in a Solvay Chemicals, Inc. Technical Communication, located at <http://www.solvaychemicals.us/resource.htm> in the Peracetic Acid section.

8.3.2. Hand protection

- Protective gloves - impervious chemical resistant:
- PVC
- Rubber 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).

8.3.3. Eye protection

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

8.3.4. Skin and body protection

- Protective suit
- If splashes are likely to occur, wear:
 - Apron
 - Boots
 - Suitable material
 - PVC
 - Rubber products

8.3.5. Hygiene measures

- Use only in an area equipped with a safety shower.
- Eye wash bottle with pure water
- When using do not eat, drink or smoke.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

Appearance	: liquid
Colour	: colourless
Odour	: pungent

9.2. Important health safety and environmental information

pH	: < 3 <i>Remarks:</i> Apparent pH
Boiling point/boiling range	: 125 °C (257 °F) (H ₂ O ₂ 70 %)
Flash point	: <i>Remarks:</i> The product is not flammable.
Flammability	: <u>Lower explosion limit:</u> <i>Remarks:</i> The product is not flammable.
Explosive properties	: <u>Explosion danger:</u> <i>Remarks:</i> With certain materials (see section 10). <i>Remarks:</i> In case of heating:
Oxidizing properties	: <i>Method:</i> Tested according to Directive 92/69/EEC. <i>Remarks:</i> Oxidizer
Vapour pressure	: 2 mbar (H ₂ O ₂ 70 %) <i>Remarks:</i> Partial pressure (H ₂ O ₂) <i>Temperature:</i> 30 °C (86 °F) : 8 - 9 mbar (H ₂ O ₂ 70 %) <i>Remarks:</i> Total pressure (H ₂ O ₂ + H ₂ O) <i>Temperature:</i> 20 °C (68 °F) : 45 mbar (H ₂ O ₂ 70 %) <i>Remarks:</i> Total pressure (H ₂ O ₂ + H ₂ O) <i>Temperature:</i> 50 °C (122 °F)

Relative density / Density	:	1.29 (H2O2 70 %)
Solubility	:	Soluble in: : Water : Polar organic solvents
Partition coefficient: n-octanol/water	:	<i>Remarks:</i> no data available
Viscosity	:	1.24 mPa.s (H2O2 70 %) <i>Temperature:</i> 20 °C (68 °F)
Vapour density	:	1.02 (H2O2 70 %)

9.3. Other data

Freezing point:	:	-40.3 °C (-40.5 °F) (H2O2 70 %)
Auto-flammability	:	<i>Remarks:</i> The product is not flammable.
Surface tension	:	77.2 mN/m (H2O2 70 %) <i>Temperature:</i> 20 °C (68 °F)
Decomposition temperature	:	>= 60 °C (140 °F) <i>Remarks:</i> Self-Accelerating decomposition temperature (SADT) : < 60 °C (140 °F) <i>Remarks:</i> Slow decomposition

10. STABILITY AND REACTIVITY

10.1. Stability

- Potential for exothermic hazard
- Stable under recommended storage conditions.

10.2. Conditions to avoid

- Contamination
- To avoid thermal decomposition, do not overheat.
- Keep at temperature not exceeding: 60 °C (140 °F)
- Keep at temperature not exceeding: 60 °C (140 °F)

10.3. Materials to avoid

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

10.4. Hazardous decomposition products

- Oxygen
- The release of other hazardous decomposition products is possible.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity

- LD50, rat, 841 mg/kg (H2O2 60 %)

Acute inhalation toxicity

- LC50, 4 h, rat, 2.000 mg/m3 (Hydrogen peroxide)

Acute dermal irritation/corrosion

- LD50, rabbit, > 2.000 mg/kg (H2O2 70 %)

Skin irritation

- rabbit, corrosive effects, 1 h (H2O2 50 %)

Eye irritation

- Risk of serious damage to eyes. (H2O2 70 %)

Irritation (other route)

- Inhalation, mouse, Irritating to respiratory system., RD 50 = 665 mg/m3 (Hydrogen peroxide)

Sensitisation

- guinea pig, Did not cause sensitization on laboratory animals.

Chronic toxicity

- Oral, Prolonged exposure, Various species, Target Organs: Gastrointestinal tract, observed effect
- Inhalation, Repeated exposure, rat, LOEL (Lowest observable effect level): 14.6 mg/m3, irritant effects

Carcinogenicity

- Oral, Prolonged exposure, mouse, Target Organs: duodenum, carcinogenic effects
- Dermal, Prolonged exposure, mouse, Animal testing did not show any carcinogenic effects.

Genetic toxicity in vitro

- In vitro tests have shown mutagenic effects.

Genetic toxicity in vivo

- Animal testing did not show any mutagenic effects.

Remarks

- corrosive effects
- Carcinogenic effect not applicable to human

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Fishes, Pimephales promelas, LC50, 96 h, 16.4 mg/l
- Fishes, Pimephales promelas, NOEC, 96 h, 5 mg/l
- Crustaceans, EC50, 48 h, 2.4 mg/l
- Crustaceans, NOEC, 48 h, 1 mg/l

Chronic toxicity

- Molluscs, NOEC, 56 Days, 2 mg/l
- Algae, Chlorella vulgaris, EC50, growth rate, 72 h, 4.3 mg/l
- Algae, Chlorella vulgaris, NOEC, 72 h, 0.1 mg/l

12.2. Mobility

- Air, Volatility, Henry's law constant (H) = 1 Pa.m³/mol
Conditions: 20 °C
Remarks: not significant
- Air, condensation on contact with water droplets
Remarks: rain washout
- Water
Remarks: The product evaporates slowly.
- Soil/sediments
Remarks: non-significant evaporation and adsorption

12.3. Persistence and degradability

Abiotic degradation

- Air, indirect photo-oxidation, t 1/2 from 16 - 20 h
Conditions: sensitizer: OH radicals

- Water, redox reaction, t 1/2 from 25 - 100 h
Conditions: mineral and enzymatic catalysis, fresh water
- Water, redox reaction, t 1/2 from 50 - 70 h
Conditions: mineral and enzymatic catalysis, salt water
- Soil, redox reaction, t 1/2 from 0.05 - 15 h
Conditions: mineral catalysis

Biodegradation

- aerobic, t 1/2 < 2 min
Conditions: biological treatment sludge
Remarks: Readily biodegradable.
- aerobic, t 1/2 from 0.3 - 5 d
Conditions: fresh water
Remarks: Readily biodegradable.
- anaerobic
Remarks: not applicable
- Effects on waste water treatment plants, Inhibitor > 30 mg/l
Remarks: inhibitory action

12.4. Bioaccumulative potential

- Bioaccumulative potential
Result: Does not bioaccumulate.

12.5. Other adverse effects

- no data available

12.6. Remarks

- Toxic to aquatic organisms.
- Nevertheless, hazard for the environment is limited due to product properties:
- . no toxicity of degradation products (H₂O and O₂).
- Inherently biodegradable.
- Does not bioaccumulate.

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Limited quantity
- Dilute with plenty of water.
- Flush into sewer with plenty of water.
- Large quantities:
- Contact manufacturer.

13.2. Packaging treatment

- Empty containers.
- Clean container with water.
- Dispose of rinse water in accordance with local and national regulations.
- Do not rinse the dedicated containers.
- The empty and clean containers are to be reused in conformity with regulations.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - Yes
- D001 (ignitable waste)
- D002 (corrosive waste)

14. TRANSPORT INFORMATION

UN-Number 2014

IATA-DGR

Class 5.1
Sub-risks Corrosive
Packing group II
ICAO-Labels 5.1 + 8

Proper shipping name: HYDROGEN PEROXIDE, STABILIZED

IMDG

Class 5.1
Sub-risks Corrosive
Packing group II
ICAO-Labels OXIDIZING AGENT + CORROSIVE
HI/UN No. 2014

Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION, STABILIZED

U.S. Dept of Transportation

Class (Subsidiary) 5.1 (8)
Packing group I
Label (Subsidiary) Oxidising agent (Corrosive)
Marine pollutant: no
Emergency info: ERG: 143

Proper shipping name: HYDROGEN PEROXIDE, STABILIZED

Canada (TDG)

Class (Subsidiary) 5.1 (8)
Packing group I
Label (Subsidiary) Oxidizer (Corrosive)
Marine pollutant: no
Emergency info: ERG: 143

Proper shipping name: HYDROGEN PEROXIDE, STABILIZED

- IATA: forbidden over 40 %

15. REGULATORY INFORMATION

15.1. Inventory Information

Toxic Substance Control Act list (TSCA)	: -	In compliance with inventory.
Australian Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.
Canadian Domestic Substances List (DSL)	: -	In compliance with inventory.
Korean Existing Chemicals List	: -	In compliance with inventory.

(ECL)		
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	: -	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	: -	In compliance with inventory.
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	: -	In compliance with inventory.
New Zealand Inventory (in preparation) (NZ)	: -	All components on composite list considered for transfer.

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- yes.

SARA Hazard Designation (SARA 311/312)

- Acute Health Hazard: Yes.
- Fire Hazard: Yes.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- not regulated.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

- yes.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

- yes.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

- WARNING! This product contains a chemical known in the State of California to cause cancer..

15.3. Classification and labelling

Canada. Canadian Environmental Protection Act (CEPA). WHMIS Ingredient Disclosure List (Can. Gaz., Part II, Vol. 122, No. 2)

- C Oxidizing Material
- E Corrosive Material
- F Dangerously Reactive Material
- Contains a controlled product

Remarks: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

EC Label

- The product is classified and labelled in accordance with Directive 1999/45/EC.

Symbol(s)	O	Oxidising
	C	Corrosive

R-phrases)	R 8 R20/22 R34	Contact with combustible material may cause fire. Harmful by inhalation and if swallowed. Causes burns.
S-phrases)	S 1/2 S17 S26 S28 S36/37/39 S45	Keep locked up and out of the reach of children. Keep away from combustible material. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)

Health = 3 Flammability = 0 Instability = 3 Special =OX

HMIS (Hazardous Material Information System)

Health = 3 Fire = 0 Reactivity = 3 PPE : Supplied by User; dependent on local conditions

Further information

- General revision
- Distribute new edition to clients
- Occupational Safety and Health Administration (OSHA) requirements for process safety management must be followed anytime at least 7500 lbs. of Hydrogen Peroxide at concentrations of at least 52 % are used or stored. Refer to 29 CFR 1910.119 for specific details.
- The National Transportation Safety Board (NTSB) and Federal Aviation Administration (FAA) have requested the following information be provided: 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 a fire.
- Wear an approved full-face air supplied respirator for excessive or unknown concentrations. Selected chemical cartridges for respirators, i.e. OV, OV/AG, GME have been tested successfully under lab conditions to remove hydrogen peroxide and peracetic acid vapors in concentrations exceeding the applicable exposure limits. Further information is available in a Solvay Chemicals, Inc. Technical Communication, located at <http://www.solvaychemicals.us/resource.htm> in the Peracetic Acid section.

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location. The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product). To our actual

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