Revision Date**:** 08/09/2013

HYDROGEN PEROXIDE (50% =< Conc. <= 60%)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name	:	HYDROGEN PEROXIDE (50% =< Conc. <= 60%)
Product grade(s)	:	Interox® 50%Standard EG Hydrogen Peroxide Interox® Hydrogen Peroxide SVP - HP®, 50% Interox® 50% UltraPure Hydrogen Peroxide Interox® Hydrogen Peroxide Chemical Grade 50% Interox® Hydrogen Peroxide Cosmetic Grade 50% Interox® Hydrogen Peroxide Food Grade 50% Interox® Hydrogen Peroxide PFP 50% Interox® Hydrogen Peroxide Technical Grade 50% Interox® Hydrogen Peroxide Standard Grade 50% Interox® Hydrogen Peroxide Storage Grade 50% Interox® Hydrogen Peroxide Technical Grade 50/C Interox® Hydrogen Peroxide Technical Grade 50/D Interox® SG Grade 50% Hydrogen Peroxide
Chemical Name	:	Hydrogen peroxide
Synonyms	:	Hydroperoxide, Hydrogen dioxide
Molecular formula	:	H2O2
Molecular weight	:	34 g/mol

1.2. Use of the Substance/Mixture

Recommended use :

- Bleaching agent
- Chemical industry
- Electronic industry
- Metal treatment
- Odour agents
- Oxidising Agents
- Textile industry
- Water treatment
- 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 number : **1 (800) 424-9300 CHEMTREC ® (USA & Canada)**
01-800-00-214-00 (MEX. REPUBLIC)

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

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2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA : H= 3 F= 0 I= 1 S= Oxidizer
HMIS : H= 3 F= 0 R= 1 PPE = Supplied by User; dependent on local conditions

General Information

Appearance : liquid
Colour : colourless
Odour : odourless

Main effects

- Oxidising
- Contact with combustible material may cause fire.
- Harmful by inhalation and if swallowed.
- Causes burns.

2.2. Potential Health Effects:

Inhalation

- Corrosive to respiratory system
- Symptoms: Breathing difficulties, Cough, pulmonary oedema, Nausea, Vomiting.
- Repeated or prolonged exposure: Nose bleeding, chronic bronchitis.

Eye contact

- Corrosive
- Causes severe burns.
- Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
- Symptoms: Redness, Lachrymation, Swelling of tissue.

Skin contact

- Corrosive
- Causes severe burns.
- Symptoms: Redness, Swelling of tissue.

Ingestion

- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.
- Symptoms: Nausea, Abdominal pain, Bloody vomiting, Diarrhoea, Suffocation, Cough, Severe shortness of breath.
- Risk of: Respiratory disorder.

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	:	**>= 50.0 - <= 60.0 %**

4. FIRST AID MEASURES

4.1. 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.

4.2. 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.

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.
- Call a physician or poison control centre immediately.
- Wash contaminated clothing before re-use.

4.4. 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 but breathing:

- Artificial respiration and/or oxygen may be necessary.

4.5. Notes to physician

Exposure to decomposition products :

- Take victim immediately to hospital.

Exposure to decomposition products :

- 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. FIREFIGHTING 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.
- Risk of explosion by shock, friction, fire or other sources of ignition.

5.4. Hazardous decomposition products

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

5.5. Special protective equipment for firefighters

- 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, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Prevent further leakage or spillage if safe to do so.
- Keep away from Incompatible products.

6.1.2. Advice for emergency responders

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

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- Drying of this product on clothing or combustible materials may cause fire.
- Keep wetted with water.

6.2. Environmental precautions

- The product should not be allowed to enter drains, water courses or the soil.
- If the product contaminates rivers and lakes or drains inform respective authorities.

6.3. Methods and materials for containment and 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.

6.4. Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE

7.1. 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.
- May not get in touch with:
- Organic materials
- Keep away from Incompatible products.
- Keep away from heat.

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 bunded 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 03 2012
  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
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  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 confined spaces/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 Peractic Acid section.
- Self-contained breathing apparatus in case of: 1) large uncontrolled emissions, 2) insufficient oxygen, 3) the mask and cartridge do not give adequate protection.

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, Natural Rubber***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	:	odourless

9.2. Important health safety and environmental information

pH	:	2.02 (H_2O_2 50 %) *Temperature*: 21 °C (70 °F)
pKa	:	pKa1= 11.62 *Temperature*: 25 °C (77 °F)
Boiling point/boiling range	:	150.2 °C (302.4 °F) (Pure substance)
	:	125 °C (257 °F) (H_2O_2 70 %)
Flash point	:	*Remarks*: not applicable
Flammability	:	*Remarks*: The product is not flammable.
Explosive properties	:	*Explosion danger*: *Remarks*: Not explosive *Remarks*: With certain materials (see section 10).
Oxidizing properties	:	*Remarks*: Oxidizer
Vapour pressure	:	200 Pa (H_2O_2 70 %) *Temperature*: 30 °C (86 °F)
	:	214 Pa (Pure substance) *Temperature*: 20 °C (68 °F)
Relative density / Density	:	1.29 (H_2O_2 70 %)1.44 (Pure substance)

Temperature: 25 °C (77 °F)

Bulk density	:	*Remarks*: not applicable
Solubility(ies)	:	*Remarks*: no data available
Partition coefficient: n-octanol/water	:	*log Pow*: -1.57 *Method*: calculated value
Viscosity	:	1.26 mPa.s (H2O2 70 %) *Temperature*: 20 °C (68 °F)
	:	1.249 mPa.s (Pure substance) *Temperature*: 20 °C (68 °F)
Vapour density	:	1.02

9.3. Other data

Freezing point:	:	-0.43 °C (31.23 °F) (Pure substance)
	:	-40.3 °C (-40.5 °F) (H2O2 70 %)
Auto-flammability	:	*Remarks*: not applicable
Surface tension	:	77.2 mN/m (H2O2 70 %) *Temperature*: 20 °C (68 °F)
	:	80.4 mN/m (Pure substance) *Temperature*: 20 °C (68 °F)
Decomposition temperature	:	>= 60 °C (140 °F) *Remarks*: Self-Accelerating decomposition temperature (SADT)
	:	< 60 °C (140 °F) *Remarks*: Slow decomposition

10. STABILITY AND REACTIVITY

10.1. Stability

- Stable under recommended storage conditions.

10.2. Conditions to avoid

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

10.3. Materials to avoid

- Acids, Bases, Metals, Heavy metal salts, Powdered metal salts, 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, 801 - 872 mg/kg (H2O2 60 %)

Acute inhalation toxicity
- LC50, 4 h, rat, > 0.17 mg/l, Remarks: vapour (H2O2 50 %)

Acute dermal irritation/corrosion
- LD50, rabbit, > 2,000 mg/kg (H2O2 70 %)

Skin irritation
- rabbit, Corrosive (H2O2 50 %)

Eye irritation
- rabbit, Corrosive (H2O2 50 %)

Sensitisation
- guinea pig, Did not cause sensitisation on laboratory animals.

Chronic toxicity
- Oral, 90-day, mouse, Target Organs**:** Gastrointestinal tract, Lowest observable effect level**:** 300 ppm, LOAEL, (Pure substance)
- Oral, 90-day, mouse, NOEL**:** 100 ppm, NOAEL, (Pure substance)
- Inhalation, 28-day, rat, Target Organs**:** Respiratory system, Lowest observable effect level**:** 10 ppm, LOAEL, vapour, (Pure substance)
- Inhalation, 28-day, NOEL**:** 2 ppm, NOAEL, vapour, (Pure substance)

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
- In vivo tests did not show mutagenic effects

Reproductive toxicity
- Substance is totally biotransformed (metabolised).
- study scientifically unjustified

Remarks
- no data available

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Fishes, Pimephales promelas, LC50, 96 h, 16.4 mg/l (Pure substance)
- Fishes, Pimephales promelas, NOEC, 96 h, 5 mg/l (Pure substance)
- Crustaceans, Daphnia pulex, EC50, 48 h, 2.4 mg/l (Pure substance)
  Remarks: fresh water, semi-static test
- Crustaceans, Daphnia pulex, NOEC, 48 h, 1 mg/l (Pure substance)
  Remarks: fresh water, semi-static test
- Crustaceans, Daphnia magna, NOEC, 21 Days, 0.63 mg/l (Pure substance)
  Remarks: Reproduction Test

Chronic toxicity

- Algae, Skeletonema costatum, EC50, Growth rate, 72 h, 2.62 mg/l (Pure substance)
- Algae, Skeletonema costatum, NOEC, 72 h, 0.63 mg/l (Pure substance)
- Algae, Chlorella vulgaris, EC50, Growth rate, 72 h, 4.3 mg/l (Pure substance)
- Algae, Chlorella vulgaris, NOEC, 72 h, 0.1 mg/l (Pure substance)

12.2. Mobility

- Air, Volatility, Henry's law constant (H) = 0.75 kPa**.**m³/mol
  Conditions: 20 °C
  Remarks: not significant
- Water
  Remarks: considerable solubility and mobility
- Soil/sediments, log KOC:0.2
  Remarks: non-significant evaporation and adsorption

12.3. Persistence and degradability

Abiotic degradation

- Air, indirect photo-oxidation, t 1/2 24 h
  Conditions: sensitizer: OH radicals
- Water, redox reaction, t 1/2 120 h
  Conditions: mineral and enzymatic catalysis, fresh water, salt water
- Soil, redox reaction, t 1/2 12 h
  Conditions: mineral and enzymatic 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
  Conditions: Soil/sediments
  Remarks: not applicable
- aerobic, t 1/2 12 h
  Conditions: Soil
  Remarks: Readily biodegradable.

12.4. Bioaccumulative potential

- Bioaccumulative potential: -1.57
  Result: Does not bioaccumulate.

12.5. Other adverse effects

- no data available

12.6. Remarks

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- 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.

13.2. Packaging treatment

- 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.

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

IATA-DGR

UN number	UN 2014
Class	5.1
Packing group	II
ICAO-Labels	5.1 - Oxidizing substances 8 - Corrosive

Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

IMDG

UN number	UN 2014
Class	5.1
Packing group	II

IMDG-Labels	5.1 - Oxidizing substances 8 - Corrosive
EmS	F-H S-Q

Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

U.S. Dept of Transportation

UN number	UN 2014
Class	5.1
Packing group	II
Label	5.1 - Oxidizing substances 8 - Corrosive
EmS	140
Remarks	UN 1066, NITROGEN COMPRESSED, 2.2

Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

Canada (TDG)

UN number	UN 2014
Class	5.1
Packing group	II
Label	5.1 - Oxidizing substances 8 - Corrosive
EmS	140

Proper shipping name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION

Mexico (NOM-002-SCT)

UN number	UN 2014
Class	5.1
Packing group	II
Label	5.1 - Oxidizing substances 8 - Corrosive

- IATA: forbidden over 40 %

15. REGULATORY INFORMATION

15.1. Inventory Information

USA. Toxic Substances Control Act (TSCA)	: -	In compliance with inventory.
Australia. Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.

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Canada. Domestic Substances List (DSL)	: -	In compliance with inventory.
Korea. Existing Chemicals Inventory (KECI (KR))	: -	In compliance with inventory.
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Japan. Inventory of Existing & New Chemical Substances (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 of Chemicals (NZIOC)	: -	In compliance with inventory.
Mexico INSQ (INSQ)	: -	In compliance with inventory.

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. 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)

- not regulated.

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)

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Health = 3 Flammability = 0 Instability = 1 Special =Oxidizer

HMIS (Hazardous Material Information System)

Health = 3 Fire = 0 Reactivity = 1 PPE : Supplied by User; dependent on local conditions

Further information

- 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.
- 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 Peractic Acid section.
- 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.

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).

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