MATERIAL SAFETY DATA SHEET

North American Version

HYDROGEN PEROXIDE (20 – 60 %)

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance/preparation

Product Name	:	Interox ® HYDROGEN PEROXIDE (20%- 60%)
Chemical Name	:	Hydrogen peroxide
Synonyms	:	Hydroperoxide, Hydrogen dioxide
Chemical Formula	:	H2O2
Molecular Weight	:	34
CAS Number	:	7722-84-1
Grades/Trade Names	:	25% : Interox® AG Spray 25-S 27% : Technical 27/D 31% : Electronic, Electronic Low Carbon, UltraPure, UltraHigh Purity, UltraPure Plus, Pico-Pure™ 35% : Technical. Technical 35/D, Cosmetic, Food, PFP™, Chemical, High Purity Food, Interox® SG-35, Interox® AG Bath 35-S, Interox® AG Spray 35-S, Interox® AG Dual 40% : Technical 50% : Technical. Technical 50/D, Dilution, Cosmetic, Electronic, Food, PFP™, UltraPure, Chemical, Chemical LP, SVP-HP®(1) 60% : Technical

(1) SVP-HP® is a trademark of EKA Chemicals

1.2. Use of the Substance/Preparation

Recommended use	:	Bleaching agents, Chemical industry, Electronic industry, Metal treatment, Odor agents, Oxidizing agents, Textile industry, Water treatment, Pulp and paper, Food processing/packaging

1.3. Company/Undertaking Identification

Address	:	Solvay Chemicals, Inc. PO BOX 27328 Houston, TX 77227-7328 3333 Richmond Ave. Houston, Texas 77098

1.4. Emergency telephone numbers

General: 1-800-765-8292 (Solvay Chemicals, Inc.,)
All Emergencies (Canada & USA): 1-800-424-9300 (CHEMTREC®)
Transportation Emergencies (INTERNATIONAL/MARITIME): 1-703-527-3887 (CHEMTREC®)
Transportation Emergencies (MEXICO-SETIQ): 01-800-00-214-00 (MEX. REPUBLIC)
525-559-1588 (Mexico City and metro area)

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2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

General Information

Appearance	:	Liquid
Color	:	Clear
Odor	:	Pungent

Main effects

- Oxidizing properties
- Irritating to skin and mucous membranes
- Harmful if swallowed.
- Risk of serious damage to eyes.

2.2. Potential Health Effects:

Inhalation

- Inhalation of vapors is irritating to the respiratory system, may cause throat pain and cough.
- Breathing difficulties
- Inhaled corrosive substances can lead to a toxic edema 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 damage.
- May cause blindness.

Skin contact

- Severe skin irritation.
- Redness
- Swelling of tissue
- Causes burns
- In case of repeated contact: dry skin.

Ingestion

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

Other toxicity effects

- See section 11: Toxicological Information

2.3. Environmental Effects:

- See section 12: Ecological Information

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3. COMPOSITION OF/INFORMATION ON INGREDIENTS

Hydrogen Peroxide
CAS-No. : 7722-84-1
Concentration : 20-60%

Water
CAS-No. : 7732-18-5
Concentration : Balance

4. FIRST AID MEASURES

4.1. Inhalation
- Remove to fresh air.
- Oxygen or artificial respiration if needed.
- Keep warm and in a quiet place.
- Victim to lie down in the recovery position, cover and keep 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.

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

4.4. Ingestion
The following actions are recommended:
- 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.
- Never give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media
- Water
- Water spray

5.2. Extinguishing media which must not be used for safety reasons
- None.

5.3. Special exposure hazards in a fire
- Oxidizing agent
- Oxygen released in thermal decomposition may support combustion
- Contact with combustible material may cause fire.

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- Contact with flammables may cause fire or explosions.
- Risk of explosion if heated under confinement.

5.4. 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.

5.5. 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 5 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.
-

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.

6.2. Environmental precautions

- Immediately inform the appropriate authorities, local, state and/or federal, in case of reportable spill.

6.3. Methods for cleaning up

- Dam up.
- Dilute with plenty of water.
- Do not add chemical products.
- Treat recovered material as described in the section "Disposal considerations".
- Never return spills to 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.

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- 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 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

- Aluminum 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 prevention of major accidents (consult an expert).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure Limit Values	TLV® ACGIH® USA	OSHA PEL
Hydrogen Peroxide	1 ppm TWA 1.4 mg/m^3 TWA	1 ppm TWA 1.4 mg/m^3 TWA

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.

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

Respiratory protection

- In case of emissions, face mask with appropriate cartridge.
- 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.

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).

Eye protection

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

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Skin and body protection

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

Hygiene measures

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

8.4 Other Information:

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.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

Appearance	:	Liquid
Color	:	Colorless
Odor	:	Pungent

9.2. Important Health Safety and Environmental Information

pH	:	1 - 4 *Remarks*: Apparent pH
Boiling point/range	:	108 °C (226 °F) - (H_2O_2 35 %) 115 °C (239 °F) - (H_2O_2 50 %)
Flash point	:	*Remarks*: The product is not flammable.
Flammability	:	*Lower explosion limit*: *Remarks*: The product is not flammable.
Explosive properties	:	*Remarks*: With certain materials (see section 10). In case of heating:
Oxidizing properties	:	*Remarks*: Oxidizing properties
Vapor pressure	:	1 mbar *Temperature*: 30 °C (86°F) - (H_2O_2 50 %) 12 mbar *Temperature*: 20 °C (68°F) *Remarks*: Total pressure (H_2O_2 + H_2O) - (H_2O_2 50 %) 72 mbar *Temperature*: 50 °C (122°F) *Remarks*: Total pressure (H_2O_2 + H_2O) – (H_2O_2 50 %)

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Relative density / Density	:	1.1 (H2O2 27.5 %) 1.2 (H2O2 50 %)
Partition coefficient (n-octanol/water)	:	*log Pow*: -1.1
Viscosity	:	1.07 mPa.s *Temperature*: 20 °C (68°F) - (H2O2 27.5 %) 1.17 mPa.s *Temperature*: 20 °C (68°F) - (H2O2 50 %)
Vapor density	:	1 (H2O2 50 %)

9.3 Other information

Freezing point:	:	-33 °C (-27 °F) (H2O2 35 %) -52 °C (-62 °F) (H2O2 50 %)
Autoinflammability	:	*Remarks*: The product is not flammable.
Surface tension	:	74 mN/m *Temperature*: 20 °C(H2O2 27,5 %)
Decomposition temperature	:	>= 60 °C (140 °F) *Remarks*: Self-Accelerating decomposition temperature (SADT)
	:	< 60 °C (140 °F) *Remarks*: Slow decomposition
Solubility	:	Soluble in: Water Polar organic solvents

10. STABILITY AND REACTIVITY

10.1. Stability
- Potential for exothermic hazard.
- Stable under recommended storage conditions with slow gas release.

10.2. Conditions to avoid
- Contamination
- To avoid thermal decomposition, do not overheat.

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.

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11. TOXICOLOGICAL INFORMATION

11.1 Toxicological data

Acute oral toxicity
- LD50, rat, 1,232 mg/kg (H_2O_2 35 %)

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

Acute dermal irritation/corrosion
- LD50, rabbit, > 2.000 mg/kg (H_2O_2 35 %)

Skin irritation
- rabbit, No skin irritation (H_2O_2 10 %)

Eye irritation
- Risk of serious damage to eyes. (H_2O_2 35 %)

Irritation (other route)
- Inhalation, mouse, Irritating to respiratory system., RD 50 = 665 mg/m^3 (Hydrogen peroxide)

Sensitization
- Guinea pig, Did not cause sensitization on laboratory animals.
-

11.2 Chronic toxicity/ Carcinogenic Designation:

Chronic toxicity
- Oral, Prolonged exposure, Various species, Target Organs: Gastrointestinal tract, observed effect
- Inhalation, Repeated exposure, dog, LOEL: 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.
-

IARC (International Agency for Research on Cancer): 3 - Not Classifiable as to Carcinogenicity to Humans.

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- TLV A3 – Animal carcinogen: Agent is carcinogenic in experimental animals at relatively high dose, by route(s) of administration, at site(s), of histologic types(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increase risk of cancer in exposed humans. Available evidence suggest that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
-

Genetic toxicity in vitro
- In vitro tests have shown mutagenic effects.

Genetic toxicity in vivo
- Animal testing did not show any mutagenic effects.

Remarks
- Risk of serious damage to eyes.
- 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

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- 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

- Mollusks, 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 treatment: Hydrogen Peroxide is not a listed hazardous waste under 40 CFR 261.

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However, state and local regulations for waste disposal may be more restrictive. Spilled product should be disposed of in an EPA approved disposal facility in accordance with applicable national, state and local environmental laws and regulations.

13.2 Packaging treatment: To avoid treatment, use dedicated containers where possible. Rinse the empty containers and treat the effluent in the same way as waste. Consult current federal, state and local regulations regarding the proper disposal of emptied containers.

13.3 RCRA Hazardous Waste: D001 (Ignitable) D002 (Corrosive)

14. TRANSPORT INFORMATION

Mode	DOT	IMDG	IATA
UN Number	2014	2014	2014 Forbidden above 40%
Class (Subsidiary)	5.1 (8)	5.1 (8)	5.1 (8)
Proper Shipping Name	Hydrogen Peroxide, aqueous solution	Hydrogen Peroxide, aqueous solution	Hydrogen Peroxide, aqueous solution
Packing Group	II	II	II
Hazard Label	Oxidizer (5.1) [Corrosive (8)]	Oxidizer (5.1) [Corrosive (8)]	5.1 + 8
Placard	Oxidizer (5.1) [Corrosive (8)]	2014	2014
Emergency Information	**ERG** 140	**EmS:** F-H,S-Q	**ERG Code** 5C

15. REGULATORY INFORMATION

15.1 National Regulations (US)

TSCA Inventory 8(b): Yes

SARA Title III Sec. 302/303 Extremely Hazardous Substances (40 CFR 355): Yes, >52% H2O2

- Reportable quantity – 1,000 lbs.
- Threshold planning quantity – 1,000 lbs

SARA Title III Sec. 311/312 (40 CFR 370:

Hazard Category:	• Immediate (acute) Health Hazard, Fire Hazard
>52% H2O2	• Threshold planning quantity – 500 lbs.
<52% H2O2	• Threshold planning quantity – 10,000 lbs.

SARA Title III Sec. 313 Toxic Chemical Emissions Reporting (40 CFR 372): No

CERCLA Hazardous Substance (40CFR Part 302)
Listed: No
Unlisted Substance: Yes, Reportable quantity 100 lbs.
Characteristic: Ignitability (D001), Corrosivity (D002)

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Other: **Occupational Safety and Health Administration (OSHA)** requirements for **process safety management (PSM)** must be followed anytime at least 7,500 lbs. of hydrogen peroxide at concentrations of at least 52% are used or stored. Refer to **29 CFR 1910.119** for specific details

15.2 National Regulations (Canada):

Canadian NSN Registration: DSL, #6754

WHMIS Classification: **C** Oxidizing material
E Corrosive
F Dangerously reactive material

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.***

15.3 National Regulations (Europe)

EINECS # : 231-765-0

16. OTHER INFORMATION

16.1 Ratings:

NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
Health = 3 Fire = 0 Instability = 1 Special = OX

HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM)
Health = 3 Fire = 0 Reactivity = 1 PPE = Supplied by User; dependent on local conditions

16.2 Other Information:

The National Transportation Safety Board (NTSB) and Federal Aviation Administration (FAA) have requested the following information be provided:

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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.

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indicated, Canada and Mexico. If the user is located in a country other than the United States, please contact the Solvay Company serving your country for MSDS information applicable to your region.

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 of 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).

16.3 Reason for revision:
Supersedes edition: Solvay Chemicals, Inc. MSDS H2O2-2060-0105, dated: 01/20/2005
Purpose of revision: Periodic review and update

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