

# MATERIAL SAFETY DATA SHEET

## Hydrogen Peroxide (20 to 40%)



MSDS Ref. No.: 7722-84-1-3

Date Approved: 06/03/2008

Revision No.: 11

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This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

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## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Hydrogen Peroxide (20 to 40%)

**ALTERNATE PRODUCT NAME(S):** Durox® Reg. & LR 35%, Oxypure® 35%, Standard 27.5 & 35%, Super D® 25 & 35, Technical 35%, HTP 35%, OHP 35%, Chlorate Grade, 20%, Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31%

**GENERAL USE:**

Durox® 35% Reg. & LR - meets the Food Chemical Codex requirements for aseptic packaging and other food related applications.

Oxypure® 35% - certified by NSF to meet NSF/ANSI Standard 60 requirements for drinking water treatment.

Standard 27.5 and 35% - most suitable grade for industrial bleaching, processing, pollution abatement and general oxidation reactions.

Semiconductor Reg, Seg, RGS, RGS 2, RGS 3, 31% - conform to ACS and Semi Specs. for wafer etching and cleaning, and applications requiring low residues.

Super D® 25 and 35% - meets US Pharmacopoeia specifications for 3% topical solutions when diluted with proper quality water. While manufactured to the USP standards for purity and to FMC's demanding ISO 9002 quality standards, FMC does not claim that it's Hydrogen Peroxide is manufactured in accordance with all pharmaceutical cGMP conditions.

Technical 35% - essentially free of inorganic metals suitable for chemical synthesis.

HTP 35% - specially formulated for aerospace equipment conditioning.

OHP 35% - specially formulated for OHP process, advanced oxidation, and activated peroxide applications

Chlorate Grade 20% - specially formulated for use in chlorate manufacture or processing.

**MANUFACTURER**

FMC CORPORATION  
FMC Peroxygens  
1735 Market Street  
Philadelphia, PA 19103  
(215) 299-6000 (General Information)  
msdsinfo@fmc.com (Email - General Information)

FMC of Canada Ltd.  
FMC Peroxygens  
PG Pulp Mill Road  
Prince George, BC V2N2S6  
(250) 561-4200 (General Information)

**EMERGENCY TELEPHONE NUMBERS**

(281) 474-8750 (Plant: Pasadena, TX, US - Call Collect)  
(250) 561-4221 (Plant: Prince George, BC, Canada - Call Collect)  
(303) 595-9048 (Medical - U.S. - Call Collect)

For leak, fire, spill, or accident emergencies, call:  
(800) 424-9300 (CHEMTREC - U.S.A.)  
(613) 996-6666 (CANUTEC - Canada)

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**2. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW:**

- Clear, colorless, odorless liquid
- Oxidizer.
- Contact with combustibles may cause fire.
- Decomposes yielding oxygen that supports combustion of organic matters and can cause overpressure if confined.
- Corrosive to eyes, nose, throat, lungs and gastrointestinal tract.

**POTENTIAL HEALTH EFFECTS:** Corrosive to eyes, nose, throat and lungs. May cause irreversible tissue damage to the eyes including blindness. May cause skin irritation.

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**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Chemical Name	CAS#	Wt. %	EC No.	EC Class
Hydrogen Peroxide	7722-84-1	20 - 40	231-765-0	O, C, Xn; R5- R8-R35- R20/22
Water	7732-18-5	60 - 80	231-791-2	Not classified

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## 4. FIRST AID MEASURES

**EYES:** Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

**SKIN:** Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

**INGESTION:** Rinse mouth with water. Dilute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

**INHALATION:** Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

**NOTES TO MEDICAL DOCTOR:** 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 ophthalmologic 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, attempts 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.

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## 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Flood with water.

**FIRE / EXPLOSION HAZARDS:** Product is non-combustible. On decomposition releases oxygen which may intensify fire.

**FIRE FIGHTING PROCEDURES:** Any tank or container surrounded by fire should be flooded with water for cooling. Wear full protective clothing and self-contained breathing apparatus.

**FLAMMABLE LIMITS:** Non-combustible

**SENSITIVITY TO IMPACT:** No data available

**SENSITIVITY TO STATIC DISCHARGE:** No data available

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## 6. ACCIDENTAL RELEASE MEASURES

**RELEASE NOTES:** Dilute with a large volume of water and hold in a pond or diked area until hydrogen peroxide decomposes. Hydrogen peroxide may be decomposed by adding sodium metabisulfite or sodium sulfite after diluting to about 5%. Dispose according to methods outlined for waste disposal.

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.

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## 7. HANDLING AND STORAGE

**HANDLING:** Wear chemical splash-type monogoggles and full-face shield, impervious clothing, such as rubber, PVC, etc., and rubber or neoprene gloves and shoes. Avoid cotton, wool and leather. Avoid excessive heat and contamination. Contamination may cause decomposition and generation of oxygen gas which could result in high pressures and possible container rupture. Hydrogen peroxide should be stored only in vented containers and transferred only in a prescribed manner (see FMC Technical Bulletins). Never return unused hydrogen peroxide to original container, 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.

**STORAGE:** Store drums in cool areas out of direct sunlight and away from combustibles. For bulk storage refer to FMC Technical Bulletins.

**COMMENTS:** VENTILATION: Provide mechanical general and/or local exhaust ventilation to prevent release of vapor or mist into the work environment.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Hydrogen Peroxide	1 ppm (TWA)	1 ppm (PEL) 1.4 mg/m <sup>3</sup> (PEL)	

**ENGINEERING CONTROLS:** Ventilation should be provided to minimize the release of hydrogen peroxide vapors and mists into the work environment. Spills should be minimized or confined immediately to prevent release into the work area. Remove contaminated clothing immediately and wash before reuse.

### PERSONAL PROTECTIVE EQUIPMENT

**EYES AND FACE:** Use chemical splash-type monogoggles and a full-face shield made of polycarbonate, acetate, polycarbonate/acetate, PETG or thermoplastic.

**RESPIRATORY:** If concentrations in excess of 10 ppm are expected, use NIOSH/DHHS approved self-contained breathing apparatus (SCBA), or other approved atmospheric-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 (AKA dust mask), especially those containing oxidizable sorbants such as activated carbon.

**PROTECTIVE CLOTHING:** 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 overboots 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.

**GLOVES:** 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.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>ODOR:</b>	Odorless
<b>APPEARANCE:</b>	Clear, colorless liquid
<b>AUTOIGNITION TEMPERATURE:</b>	Non-combustible
<b>BOILING POINT:</b>	103°C/218°F (20%); 107°C/225°F (31%); 108°C/226°F (35%)
<b>COEFFICIENT OF OIL / WATER:</b>	Not available
<b>DENSITY / WEIGHT PER VOLUME:</b>	Not available
<b>EVAPORATION RATE:</b>	> 1 (Butyl Acetate = 1)
<b>FLASH POINT:</b>	Non-combustible
<b>FREEZING POINT:</b>	-15°C/6°F (20%); -26°C/-15°F (31%); -33°C/-27°F (35%)
<b>ODOR THRESHOLD:</b>	Not available
<b>OXIDIZING PROPERTIES:</b>	Strong oxidizer
<b>PERCENT VOLATILE:</b>	100
<b>pH:</b>	<= 3.7 5.0 - 6.0 @ 25 °C (1% solution)
<b>SOLUBILITY IN WATER:</b>	100 %
<b>SPECIFIC GRAVITY:</b>	1.07 @ 20°C/4°C (20%); 1.11 @ 20°C/4°C (31%); 1.13 @ 20°C/4°C (35%)
<b>VAPOR DENSITY:</b>	(Air = 1): Not available
<b>VAPOR PRESSURE:</b>	28 mmHg @ 30°C (20%); 24 mmHg @ 30°C (31%); 23 mmHg @ 30°C (35%)

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## 10. STABILITY AND REACTIVITY

<b>CONDITIONS TO AVOID:</b>	Excessive heat or contamination could cause product to become unstable.
<b>STABILITY:</b>	Stable (heat and contamination could cause decomposition)
<b>POLYMERIZATION:</b>	Will not occur
<b>INCOMPATIBLE MATERIALS:</b>	Reducing agents, wood, paper and other combustibles, iron and other heavy metals, copper alloys and caustic.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Oxygen which supports combustion.
<b>COMMENTS:</b> Materials to Avoid : Dirt, organics, cyanides and combustibles such as wood, paper, oils, etc.	

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## 11. TOXICOLOGICAL INFORMATION

**EYE EFFECTS:** 35% hydrogen peroxide: Extremely irritating/corrosive (rabbit) [FMC Study Number: I83-748]

**SKIN EFFECTS:** 35% hydrogen peroxide: Mildly irritating after 4-hour exposure (rabbit) [FMC Study Number: I83-747]

**DERMAL LD<sub>50</sub>:** 35% hydrogen peroxide: > 2,000 mg/kg (rabbit) [FMC Study Number: I83-746]

**ORAL LD<sub>50</sub>:** 35% hydrogen peroxide: 1,193 mg/kg (rat) [FMC Study Number: I83-745]

**INHALATION LC<sub>50</sub>:** 50% hydrogen peroxide: > 0.17 mg/l (rat) [FMC Study Number: I89-1080]

**TARGET ORGANS:** Eyes, nose, throat and lungs

**ACUTE EFFECTS FROM OVEREXPOSURE:** Extremely irritating/corrosive to eyes and gastrointestinal tract. May cause irreversible tissue damage to the eyes including blindness. Inhalation of mist or vapors may be severely irritating to nose, throat and lungs. May cause skin irritation.

**CHRONIC EFFECTS FROM OVEREXPOSURE:** 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).

**CARCINOGENICITY:**

Chemical Name	IARC	NTP	OSHA	Other
Hydrogen Peroxide	Not listed	Not listed	Not listed	(ACGIH) Listed (A3, Animal Carcinogen)

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## 12. ECOLOGICAL INFORMATION

**ECOTOXICOLOGICAL INFORMATION:** Channel catfish 96-hour  $LC_{50}$  = 37.4 mg/L

Fathead minnow 96-hour  $LC_{50}$  = 16.4 mg/L

Daphnia magna 24-hour  $EC_{50}$  = 7.7 mg/L

Daphnia pulex 48-hour  $LC_{50}$  = 2.4 mg/L

Freshwater snail 96-hour  $LC_{50}$  = 17.7 mg/L

For more information refer to ECETOC "Joint Assessment of Commodity Chemicals No. 22, Hydrogen Peroxide." ISSN-0773-6339, January 1993

**CHEMICAL FATE INFORMATION:** 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 hrs. and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

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## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** An acceptable method of disposal is to dilute with a large amount of water and allow the hydrogen peroxide to decompose followed by discharge into a suitable treatment system in accordance with all regulatory agencies. The appropriate regulatory agencies should be contacted prior to disposal.

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## 14. TRANSPORT INFORMATION

### U.S. DEPARTMENT OF TRANSPORTATION (DOT)

<b>PROPER SHIPPING NAME:</b>	Hydrogen peroxide, aqueous solutions with not less than 20% but not more than 40% hydrogen peroxide
<b>PRIMARY HAZARD CLASS / DIVISION:</b>	5.1 (Oxidizer)
<b>UN/NA NUMBER:</b>	UN 2014
<b>PACKING GROUP:</b>	II
<b>LABEL(S):</b>	Oxidizer, Corrosive
<b>PLACARD(S):</b>	5.1 (Oxidizer)

**ADDITIONAL INFORMATION:**

DOT Marking: Hydrogen Peroxide,  
aqueous solution with not less than 20%,  
but not more than 40% Hydrogen Peroxide,  
UN 2014

Hazardous Substance/RQ: Not applicable

49 STCC Number: 4918775

DOT Spec: stainless steel/high purity  
aluminum cargo tanks and rail cars. UN

Spec: HDPE drums. Contact FMC for  
specific details.

**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 (\*).

**OTHER INFORMATION:**

(\*) Air regulations permit shipment of Hydrogen Peroxide (20 - 40%) in non-vented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all FMC Hydrogen Peroxide containers are vented and therefore, air shipments of FMC H<sub>2</sub>O<sub>2</sub> is not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

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

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## **15. REGULATORY INFORMATION**

### **UNITED STATES**

**SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**

**SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):**

Not listed

**SECTION 311 HAZARD CATEGORIES (40 CFR 370):**

Fire Hazard, Immediate (Acute) Health Hazard



**SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):**

The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:  
None, (conc. <52%)

**SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):**

Not listed

**CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)**

**CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):**

Unlisted (Hydrogen Peroxide 20-40%); RQ = 100 lbs.; Ignitability, Corrosivity

**TSCA (TOXIC SUBSTANCE CONTROL ACT)**

**TSCA INVENTORY STATUS (40 CFR 710):**

Listed

**RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)**

**RCRA IDENTIFICATION OF HAZARDOUS WASTE (40 CFR 261):**

Waste Number: D001, D002

**CANADA**

**WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM):**

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.

Hazard Classification / Division: C  
E  
D2B

Product Identification Number: 2014  
Ingredient Disclosure List: Listed  
Domestic Substance List: All components listed

**INTERNATIONAL LISTINGS**

Hydrogen peroxide:

China: Listed  
Japan (ENCS): (1)-419  
Korea: KE-20204  
Philippines (PICCS): Listed

**HAZARD AND RISK PHRASE DESCRIPTIONS:**

EC Symbols: O (Oxidizer)

	C	(Corrosive)
	Xn	(Harmful)
EC Risk Phrases:	R5	(Heating may cause an explosion.)
	R8	(Contact with combustible material may cause fire)
	R35	(Causes severe burns.)
	R20/22	(Harmful by inhalation and if swallowed.)

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## 16. OTHER INFORMATION

### HMIS

Health	3
Flammability	0
Physical Hazard	1
Personal Protection (PPE)	H

Protection = H (Safety goggles, gloves, apron, the use of a supplied air or SCBA respirator is required in lieu of a vapor cartridge respirator)

HMIS = Hazardous Materials Identification System

Degree of Hazard Code:

4 = Severe

3 = Serious

2 = Moderate

1 = Slight

0 = Minimal

### NFPA

Health	3
Flammability	0
Reactivity	1
Special	OX

SPECIAL = OX (Oxidizer)

NFPA (National Fire Protection Association)

Degree of Hazard Code:

4 = Extreme

3 = High

2 = Moderate

1 = Slight

0 = Insignificant

### **REVISION SUMMARY:**

This MSDS replaces Revision #10, dated April 27, 2006.

Changes in information are as follows:

Section 1 (Product and Company Identification)

Section 3 (Composition / Information on Ingredients)

Section 15 (Regulatory Information)

Section 16 (Other Information)

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